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SVANNINGE STAMPEMØLLE

Reconstructing the Fulling Mill

at

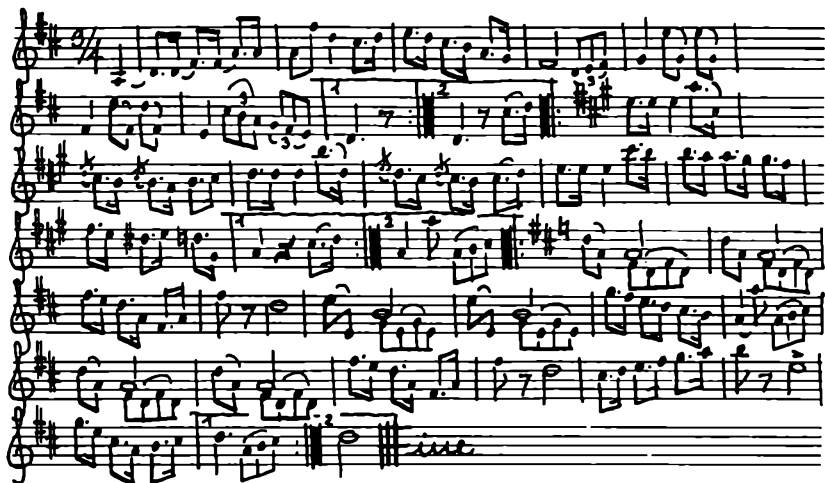
KØBSTADSMUSEET DEN GAMLE BY, AARHUS

Anders Jespersen



1966

Stampe-vals'en Ole Kjær.



Stampevals'en komponeret af Spillemand Ole Kjær, som døde ca. 1860. Ole Kjær levede ved Ringkøbing, men blev inspireret til Stampevals'en paa en stampemølle i nærheden af Pjedsted. Nedskrevet af Arkitekt M. A. A. Poul Brøgger.

The Fulling Waltz composed by Country Violin Player Ole Kjær, who died c. 1860. Ole Kjær lived near Ringkøbing, but was inspired to write this piece of music in a fulling mill near Pjedsted (Fredericia). Copied by Poul Brøgger, M. A. A.

Fig. 2 → neg. 231.30: DK-63-Svanninge Stampemølle paa den oprindelige beliggenhed, set fra nord. Fotograferet den 11-06-44. Vandmøllen til venstre, beboelseshuset til højre.

The fulling mill in its original location at Svanninge, seen from the North. Photographed 11-06-44. The watermill is on the left, the residence on the right.



REKONSTRUKTIONEN AF VÆRKET I SVANNINGE STAMPEMØLLE I DEN GAMLE BY, AARHUS

Svanninge Stampemølle opførtes 1824 i Svanninge Sogn ved Faaborg. Den var i drift som kombineret korn- og stampemølle til et sted mellem 1900 og 1914. Efter en lang stilstand fulgte en kort opblussen i 1938, hvor møllen virkede som savskæreri, og efter sidste krig øgedes forfaldet hurtigt. Det var i sidste øjeblik at møllen - paa initiativ af Direktør Brahe Christensen - erhvervedes til flytning til Købstadmuseet Den Gamle By i Aarhus.

Nedtagningen foretoges i 1952 af Docent, Arkitekt M. A. A. H. H. Engqvist, idet nedtagningen af værket dog udtrykkelig var undtaget arkitektens mandat.

Genrejsningen fandt sted i 1962-65, dels ved at Den Gamle Bys Arkitekt, Aage Kristensen, M. A. A., ledede genopstillingen af selve huset efter Arkitekt Engqvists tegninger, dels ved at Museet med skrivelse af 24-08-63 og 28-02-64 overdrog mig som teknisk raadgiver for Nationalmuseets Mølleudvalg at søge at genskabe stampe- og mølleværket.

Den 10. maj 1965 blev anlægget indviet.



Det udgangsmateriale, der forelaa var følgende:

1) Stampemøllen var som sagt genrejst efter opmaalingstegninger og bygningsarkæologiske undersøgelser foretaget af Arkitekt Engqvist, mens genrejningsarbejdet var ledet af Arkitekt Kristensen.

Registreringen af stampeværket og møllens øvrige maskineri var udtrykkelig undtaget Arkitekt Engqvists mandat, hvad der er grund til at beklage, da en undersøgelse af stampeværket - ikke mindst af fundamenterne under det forsvundne kars plads - foretaget med den samme grundighed og sagkundskab som i det øvrige hus, ville have lettet rekonstruktionen af værket overmaade.

2) Fra Arkitekt Engqvist og hans assistenters haand forelaa en serie maaleblade, hvoraf det vigtigste er medtaget som fig. 43. Hertil et komplet sæt opstillingstegninger, der har dannet grundlaget for fig. 43 ... 46.

3) To fotografier, fig. 38 & 39 taget under nedtagningen, ingen ved af hvem. Billederne er taget i 1952 og tilhører Den Gamle By. Disse fotografier blev vore vigtigste vidner.

4) Min egen undersøgelse af 05-05-48, nedtegnet efter et interview med Tømrer Rasmus Hansen, fig. 22.

5) Fire daarlige fotografier, det ene taget af Professor, dr. phil. S. B. Bøcher i 1944, de andre tre af mig selv i 1938 og 1947, alle af møllens indre. De to af billederne er medtaget som fig. 14 og 37. Billederne var dog meget nyttige sammenholdt med 3).

6) Brandtaxation fra 1825, se nedenfor.

7) Brandtaxation fra 1845, se nedenfor.

8) Brandtaxation fra 1864, se nedenfor.

9) Landvæsenskommissionskendelse fra 1864, optaget i Regulativet for Hornemøllebæk af 27-11-1865 med tilføjelse i Regulativet af 18-06-1931.

10) Brandtaxation fra 1869, se nedenfor.

11) Mine opmaaling af hjulene i 1944 til 48, se nedenfor.

12) Tegninger til stampeværk paa DK-568-Stampen, se nedenfor.

13) Fotografier af S-32-Bodarsjön Stampa, Skansen, fulgt op af et fornyet besøg, se fig. 30.

14) Konkret materiale:

- 14.1) Vandhjulsaxlen,
- 14.2) Rester (ubrugelige) af vandhjulet,
- 14.3) Gravhjulet, træ med paaboltede støbejernssegmenter,
- 14.4) Vellen (den lodrette axel),
- 14.5) Krondrevet, træ,
- 14.6) Stjernhjulet,
- 14.7) Stampeaxlen med enkelte knaster intakt,
- 14.8) Krondrevet paa denne axel (støbejern med trækamme),
- 14.9) Lejeblokke til de vandrette axler,
- 14.91) Del af skæreværkets plankedæk (men intet af selve skæreværket),
- 14.92) Dele af gelænderet,
- 14.93) Diverse trapper og dele af undertømmer til galleri.



ad 1) Paa basis af Arkitekt Engqvists materiale og en analyse af 2) ··· 14) er fremstillet et tegningssæt, som ledsager denne beretning (fig. 43 til 46) og som styrede rekonstruktionen i marken. Huset er 7.38 m bredt og 7 fag = 11.10 m langt. Tegningerne var for værkets vedkommende ment som en rettesnor, idet vi ansaa det for fordelagtigst at benytte materiale fra nedbrudte møller i stedet for nyt træ, hvor dette var muligt.

Det traf sig saa heldigt, at tømmeret fra den meget smukke og solidt byggede DK-53-Kilde Mølle, der i sin tid byggedes af Godset Ravnholt paa Fyn, var til fals, da møllebygningen blæste ned i en storm i vinteren 1963/64.

Paa lignende vis gik det med de to kværne, som netop blev tilbudt Mølleudvalget i 1964 fra DK-35-Turup Mølle ved Assens. Møller Jørgensen var død, og Fru Jørgensen var saa venlig at skænke møllens inventar til mølleistandsættelse andetsteds, da hun agtede at sælge ejendommen. Møllen var ikke bevaringsværdig som en helhed paa grund af stærk ombygning, kun hjørnet omkring skæreværket var urørt.

ad 4) Tømrer Rasmus Hansen var syg og sengeliggende, da Museumsdirektør Svend Larsen, Odense, og jeg besøgte ham i maj 1948. Konversationen var yderst vanskelig, men skitsen i fig. 22 blev resultatet: Møllen havde haft et stort, aabent rum med en balkon løbende rundt langs de tre vægge. Langs den fjerde, ud mod vandhjulet, laa i samme højde skæreværket, det vil sige en svær bro, hvorpaa de to kværne var placeret, og hvortil stampeværket antagelig havde støttet sig.



Fig. 3: neg. 10.03: 04-08-38: Stampemøllen i Svanninge, set fra øst.
The Fulling Mill in Svanninge, seen from the East.

Fig. 4: neg. 1161.35: 21-09-59: Museumsparken i Aarhus før Stampemøllens genopbygning.

The Museum Park in Aarhus, prior to the re-erection of the Fulling Mill.





**Fig. 5: neg. 1769.14: 08-05-65: Stampemøllen genrejst i Den Gamle By, Aarhus.
The Fulling Mill restored in the Borough Museum Den Gamle By in Aarhus.**

**Fig. 6: neg. 1161.33: 21-09-59: Samme synsvinkel som ovenfor, før genrejsningen
af Stampemøllen.**

Same view as above, prior to the rebuilding of the Fulling Mill in Aarhus.



Vi fik stampernes dimension opgivet til 15" x 3" dansk, svarende til ca. 40 cm x 8 cm, men desværre fik vi ikke opgivet længden. Stampekarret var 1 alen i kvadrat eller 63 cm x 63 cm. Der havde foruden disse maskiner været et par sigter ovre langs vandhjulsvæggen.

Ved siden af møllen var et bryggers, hvor man havde varmet vandet til stampekarrene, og hvor der desuden stod en vaskemaskine trukket af møllen med snoretræk. Skyllevandet toges fra mølledammen. Gruekedlen var angiveligt af kobber.

ad 6) Brandtaxationsprotokol for Svanninge Sogn, Salling Herred, B 1812-1825, (Landsarkivet for Fyn):

Svanninge Stampemølle, pag. 552, Januar Kvartal 1825, 196₃. Peder Hansens under Grevskabet Brahesminde, Steensgaard.

a: En Længde, Sønder og Nord, 7 Fag, dybt 12 Alen (7.54 m), Ege Under Fyrre Overtømmer, murede Vægge af brændte Sten og Straaetag, Loft, Vinduer og Døre samt 1 Skorsten. Saa en Længde tildels indrettet til Værelser og til dels til Brug for det sammesteds befindende Stampe- og Sigteværk og blev saaledes denne Bygning som i enhver Henseende ere af gode, solide og nye Materialer og i forrige Aar opført, taxeret pr. Fag til 80 Rbd. Repr. ialt 560 Rdl. Repr. Sølvs 498 Rdl. nedsat efter Forlangende til 470 Rdl.

b: Stampe- og Sigteværket, som findes i Litra A bestaar af en fuldkommen Stampe med 6 Hammere samt en Sigtekværn hvilket alt drives ved et Vandhjul og blev saaledes dette Værk med alle dets staaende og løbende Redskaber vurderet og taxeret for 600 Rbd. Sølvs 535 for 530 Rdl. Ej før forsikret. Forsvarlig mod Ildsvaade. Summa 1000 Rdl. Sølvs Theile - Lars Hansen - Rasmus Eilersøn - O. L. Trolle.

Kommentar:

Det forekommer sandsynligt, at møllen er opført aaret før denne taxation. Det indhuggede aarstal over døren, 1834, er meget senere og dateringsmæssigt upaalideligt.

Der kan næppe herske tvivl om, at dette er Stampemøllen, som vi kender den i dag - saa vidt angaar det bygningsmæssige. Men møllens indre er forskellig fra den senere udformning, for der er kun een kværn. Paa fig. 18 & 38 kan vi se, hvorledes der lige over gravhjulet er et solidt, sammenlænket skæreværks-system, som senere er udvidet ind i møllen. Der er for mig ingen tvivl om, at møllen ved opførelsen i 1824 har været uden stjernhjul og med eet-trins træk fra gravhjulet direkte op til kværndrevet, som vi stadig finder det i DK-76-Kaleko Mølle. Vi maa formode, at sigten har været en Beutel-kasse som paa Kaleko.

Stampeværket, derimod, svarer ganske til de forhold, som beskrives senere, sidst af Tømrer Hansen, og ogsaa af den bevarede stampeaxel kan vi se, at der har været 6 stamper.

ad 7) Brandtaxationsprotokol for Svanninge Sogn og Bye, Salling Herred, F
1844 - 1850 (Landsarkivet for Fyn):

Svanninge Stampemølle, pag. 105, 1845, 72₂, nu Madame Hansens under
Stensgaard Gods.

c: En Længde vest for "a", 7 Fag, dyb 9 ¹/₄ Alen (5.8 m). Ege Under, Fyrre
Overtømmer, murede Vægge, Straaetag, fra Syd 4 Fag til Beboelse med Loft,
Vinduer og Dørre, Steengulv, Skorsteen og Ovn. 3 Fag til Kostald og Tørvehuus,
taxeret og vurderet til: 4 Fag a 40 Rdl. er 160 Rdl. 3 Fag a 25 Rdl. er 75 Rdl.
tilsammen 235 Rdl. Er det samme i Sølv, forsikres med 240 Rdl.
Møllen Fag 105. 28 for 1000 Rdl.
udgør ialt 1240 Rdl.

Forsvarlig mod Ildsvaade. Wilh. Thejle - Brand - H. Lau - Rasmus Pedersen.

Kommentar:

Vi tør maaske slutte, at stampe- og møllemesteren har boet i 20 aar i selve
stampemøllehuset. Saa har han tjent saa meget, at der er blevet raad til at byg-
ge et beboelseshus lige overfor - se til venstre i fig. 1. I møllen kan han have
haft en svend boende. Muligt er den nye bolig opført som aftægtsbolig for Peder
Hansens enke ("nu Madame Hansen") mens næste generation fortsætter i møl-
len. Det er tænkeligt, at bedriften er udvidet med en videre forarbejdning af
klædet, som dette er vist ved genopstillingen i Aarhus (rue- og overskærerma-
skine, se fig. 24 & 25), maaske kommer denne udvikling først i sidste del af
aarthundredet.

ad 8) Brandtaxationsprotokol for Svanninge Sogn, Salling Herred, K 1857-1871.
(Landsarkivet for Fyn) :

Svanninge Stampemølle, fol. 306, Aar 1864 den 1ste Decbr. Kl. 3 Eftermiddag
indfandt Branddirecteuren sig i den paa Svanninge Mark beliggende saakaldte
Stampemølle for ifølge Godsforvalter Sandaggers Forlangende at foranstalte
bemeldte Mølle paa ny forsikret i den almindelige Brandforsikring for Landbyg-
ninger i Anledning af Mølleværkets Ombygning.

Af de af Amtsraadet udmeldte Taxationsmænd vare efter Tilsigelse mødte Jern-
støber og Møllebygger L. Jensen og Tømremester Henning Hansen af Faaborg,
ligesom Reqvirenten ogsaa var mødt.

Forretningen fremmedes som følger:

167. Stampemøllen i Svanninge Sogn, under Steensgaard Gods, Matr. No. 76.

a, Lengde i Syd og Nord, 7 Fag, 17 ¹/₂ Alen (11.00 m) lang, 11 ³/₄ Alen (7.38 m)
dyb og 3 ¹/₂ Alen (2.2 m) høi, Ege Under og Fyrre Overtømmer, brendte Muur-
steens Væge og Straatag, indrettet fra Syd: Stue med Fjellegulv, Sovekammer og
Kjøkken med Mursteens Gulv samt Møllehuus, Loft over hele Længden med et
Kammer paa Loftet med Fjelleloft.

I Møllehuset 2 Lofter, 8 ¹/₂ Fag Vinduer med smaa Ruder 3 (muligvis kun 2)
glatte og 2 Fyldningsdørre indvendig og ere udvendig med Fyldinger.

Taxeret 7 Fag a 90 Rdl. 630 Rdl.

En tildels ny Malekarm af Ege og Fyr, 6 Alen (3.76 m) lang, 1 ³/₄ Alen (1.12 m)
bred, 2 Alen (1.26 m) dyb 100 Rdl.

Et Møllehjul 5 ¹/₄ Alen (3.30 m) i Diameter 1 ¹/₄ Alen (0.79 m) bredt af Ege og
Fyr 200 Rdl.

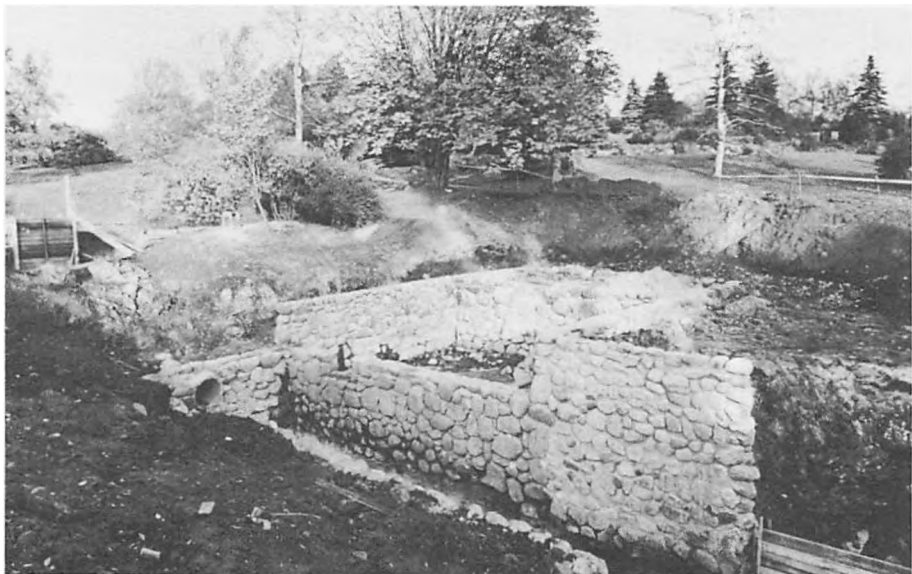


Fig. 7: neg. 1384.19: 27-10-62: Genrejsningen af Stampemøllen i Aarhus: fundamentene støbt.

Rebuilding the Fulling Mill in Aarhus: casting the foundations.

Fig. 8: neg. 1721.05: 07-04-64: Huset genrejst; værket mangler endnu.

The house re-erected. All plant is yet to come.





**Fig. 9: neg. 1726.04: 06-08-64: Værket begynder at tage form.
The plant is taking shape.**

**Fig. 10: neg. 1555.19: 10-05-65: Indvielsesdagen.
Day of inauguration.**



Det i Litr. a nævnte Mølleværk, bestaaende af 2 Qværne, Sigtekasse med Sigter og 1 Sækkevindsel m. m. 700 Rdl.

b. Længde Vest for a, 7 Fag, 19 Alen (11.9 m) lang, $9\frac{1}{4}$ Alen (5.81 m) Dybt og $3\frac{1}{2}$ Alen (2.20 m) høit, af samme Bygningsmaterialier som a med Straa-tag indrettet fra Syd 2 Stuer med Muursteens Gulv og Forstue samt Værksted, med Loft over $2\frac{1}{2}$ Fag, Kostald, Hønsehuus og Brændehuus. 3 indvendige og 3 udvendige glatte Dørre samt $6\frac{1}{2}$ Fag Vinduer med smaa Ruder, 1 Skorsteen af brændte Steen.

Taxeret 7 Fag a 60 Rdl. 420 Rdl.
2050 Rdl.

Bygningerne temmelig ny og vel vedligeholdte samt forsvarlige indrettet mod Ildsfare. De stode forhen forsikrede under No. 35 for 1240 Rdl., som nu udgaaer. Bygningerne ligge langt over 100 Alen (62.80 m) fra nærmeste fremmed Bygning. Reqvirenten erklærede sig tilfreds med Taxationen, som Mændene erklærede at have foretaget efter Samvittighed og bedste Skøn, saaledes som de trøste dem til inden Retten eedelig at bekræfte.

Saaledes passeret bekræftes med Underskrift.
C. N. Wiborg - L. Jensen - Sandagger - E. Hansen.

Gebyr:

Til Branddirecteuren 1 Rdl. 48 S.
Til Mændene 2 Rdl. - S.
3 Rdl. 48 S.

skriver tre Daler og fyrgetyve og otte Skilling.

C. N. Wiborg.

K o m m e n t a r :

Vi faar her en meget præcis skildring af hele værket, især af vandhjulet og af Malekarmen, der har kunnet rekonstrueres fra disse maal sammenholdt med den følgende Landvæsenskommissionskendelse. Naturligvis maatte længden af malekarmen afpasses efter de topografiske forhold i Aarhus, saa malekarmen er her blevet 8 m lang mod taxationens 3.76 m. Dette skyldes bl. andet, at man i Svanninge havde en stensætning til at holde mølledæmningen bag huset og derfor kunne afvikle dæmningen paa en kortere strækning. Desuden skød mølledammen sig ind mod huset i en kile, se fig. 1.

Der er nu kommet 2 kværne, og disse har naturligvis været drevet af et stjernhjul, nøjagtig som det nu er rekonstrueret i Aarhus.

Sigtekasserne kan stadig have været Beutel-kasser som før, men det er muligt, at de kan have ligget langs hjulsiden, hvor Tømrer Hansen fortalte os, at de laa til sidst. Det er det sted, hvor der er bedst plads til dem, omend det kan give vanskeligheder derved, at melet maa overføres manuelt fra kværnene til sigterne, da møllen ikke havde kornelevator. Vi har stadig en ledig snorskive paa stjernhjulet til drift af sigterne, der paa dette sted sikkert har været tromlesigter.

Det er endnu ikke lykkedes at skaffe et par brugelige sigter, men det sker for-

haabentlig en dag. Tilsvarende gælder for sækkevinden, der utvivlsomt har været haandrevet, et saakaldt kransetov. Der er spor i gulvbræder og slidspor i en bjælke der viser, hvor dette hejseværk maa have siddet (midt for galleriet, udfor skorstenen).

De to kværnes placering har nødvendiggjort en udbygning ind i møllen, og af pædagogiske grunde er denne udbygning i rekonstruktionen udført i fyr, mens resten af skæreværket er i eg. Det er for at vise det senere træk i denne tilbygning paa en tid, hvor maskinbestykningen blev vigtigere end materialernes durabilitet (se fig. 18) - et træk vi kender fra mange andre møller i denne periode.

Man kan undre sig over, hvor stampeværket kan være blevet af i denne taxation. Det dukker jo op igen nedenfor (1869) omend kun med "4 hammer".

Der kan være sket ombygninger, vi ikke længere kan følge, men det kan ogsaa tænkes, at man bevidst kun har forsikret det, der skal forsikres - eller skulle (af gammel vane). Saa længe Mølleprivilegierne bestod, det vil sige indtil 1862, var disse privilegier en servitut Kronen, senere Staten, havde paa alle kornmøller. Følgelig maatte ejeren forsikre denne behæftelse, saa Kronen/Staten kunne holdes skadesløs ved en evt. brand. Men et stampeværk krævede ikke tilladelse og skulle følgelig heller ikke forsikres, og heri kan ligge en forklaring paa at stampeværket, som maaske har været defekt i 1864, ikke er medtaget - idet man har brugt samme forsikringsprocedure som før 1862.

Imod denne antagelse taler to ting: den ene er indretning af køkkenet i denne bygning, formentlig hvor der før var bryggers, og den anden finder vi i 1869-taxationen, der øjensynlig er taget til ære for det "indlagte Stampeværk med 4 Hammer". At det saaledes beskrevne stampeværk er "aldeles nyt" behøver jo ikke at betyde, at der ikke har været et andet mere eller mindre opslidt værk umiddelbart forud.

ad 9) Uddrag af Regulativ for Hornemøllebæk af 27-11-1865:

.....
2. Flodemaallet for Svanninge Mølle er af en Landvæsenscommission den 13de December 1864 bestemt saaledes:

Fra Bunden af Malekarmen skal være 1 Alen $4\frac{1}{2}$ Tomme (0.74 m) opefter til Flodemaalshøiden, som da kommer til at ligge 8 Tommer (0.21 m) under Overkanten af Malekarmens Sidehammer. Flodemaallet betegnes ved et i Malekarmen gjort Indhug, hvis Underkant er gjældende.

Ligeledes blev paa den nordostre Hjørnestolpe af selve Møllehuset gjort et Indhug, hvis Underkant er gjældende som Flodemaal.

Begge disse Mærker ligger i Niveau med hinanden.





Fig. 12: neg. 1725. 11: 17-07-64: Møllebygger Dahlerup (under kranen) da montagen af skæreværket paabegyndtes.

Millwright Dahlerup (below the crane) at the beginning of the erection of the stone hurst.

← Fig. 11: neg. 1732. 33: 01-09-64: Malekarmen under bygning. Fra venstre til højre: Hans - Møllebygger Petersen - Møllebygger Dahlerup - Oskar.

The pentrough being erected. Left to right: Hans - Millwright Petersen - Millwright Dahlerup - Oskar.

Fig. 13: neg. 1746. 06: 01-04-65: Hjulmager Børge Hillebrand arbejder paa stamperne 5 uger før indvielsen.

Wheelwright Børge Hillebrand at work on the fulling stocks 5 weeks before inauguration.



Det blev betydet Brugerne af begge Møller (DK-119-Grubbe Mølle er tidligere nævnt), at de ingensinde maatte lade foretage Forandringer eller Reparationer, hvorved Flodemaalsmærkerne enten blive borttagne eller forrykkede, uden i Tide forinden herom at giøre Anmeldelse til Amtet.

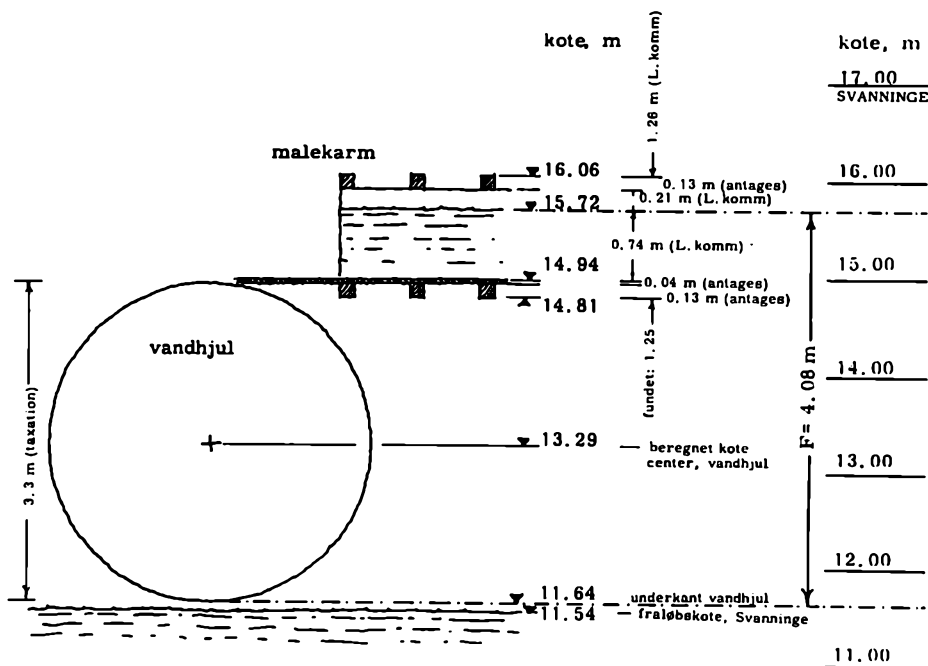
Uddrag af Regulativ for Hornemøllebæk af 18-06-1931:

1. Svanninge Mølle. Flodemaalet er fastsat af en Landvæsenskommision den 13. Decbr. 1864. De Bestemmelser, som knyttede sig til Malekarmen, er ikke mere gældende, idet Malekarmen siden er fornyet. Paa selve Møllehusets nordøstre Hjørnestolpe blev gjort et Indhug, hvis Underkant er gældende Flodemaal. Dette Indhug findes stadig og har Kote 15.72 (m).

Kommentar:

Sammenholdes oplysningerne i disse tre dokumenter, der for de to førstes vedkommende i tid kun ligger 12 dage fra hinanden, faar vi følgende billede af forholdene omkring vandhjulet:

Fig. 47



Desværre foreligger der ikke i forbindelse med nedtagningen noget nivellement af møllen og dens omgivelser.

I Aarhus var møllebygningen allerede placeret, og flodemaalsmærket paa huset

kunne netop spores som en ca. 2 cm bred udhugning i hjørnestolpen mod malekarmen. Midten maales til kote 12.07 m (Aarhus) efter genopstillingen.

Betonkarmen i mølledammen var i Aarhus kote 12.06 m, mens overløbet fra dammen laa i kote 11.71 m. I den nedenforliggende vandmølle, DK-1386-Møllerup Mølles dam ligger flodemaalet i kote 7.51 m, men denne højde kan for tiden ikke udnyttes, da røret, hvorigennem vandet fra Stampemøllen løber, ligger i kote 7.66 m paa det laveste punkt.

Under hensyn til den lange malekarm, som skulle kunne tømmes for vand, lagdes 2 cm til flodemaalet, og det ansaas ikke for realistisk at lægge dette over betonkarmen. Flodemaalet for Aarhus sattes derfor til kote 11.90 m, altsaa $12.07 \text{ m} - 11.90 \text{ m} = 0.17 \text{ m}$ under det, huset var opstillet efter. Dette gav fordele indendørs, som vi senere skal se. For husets vedkommende fik vi forskellen mellem Svanninge og Aarhus til: $15.72 \text{ m} - 12.07 \text{ m} = 3.65 \text{ m}$ og for malekarm og vandhjul til: $13.29 \text{ m} - 9.47 \text{ m} = \underline{3.82 \text{ m}}$
 --forskellen som før 0.17 m

I øjeblikket staar dammen i kote 11.71 m, men alt er indstillet paa de mulige 11.90 m, der paa grund af vandløbets stærke fald ikke vil genere det ringeste, tværtimod vil de kedelige betonkarne kunne begraves, da dæmningen bør have en sikkerhedshøjde paa ca. 0.3 m over flodemaalet, altsaa ca. kote 12.20 m.

Værre er det, at vandhjulets underkant er i kote 7.82 m med et afløb, som teoretisk er minimalt i kote 7.66. Det skulle give 0.16 m under hjulet, men i praksis gaar vandhjulet desværre altid i bagvand, da vandet stuver i røret, der muligt er sandet delvis til. En sikker løsning ligger i at erstatte rørledningen med en opgravning fra Møllerup-dammen forbi Apoteket og tilbage til Stampemøllen og med en etablering af en granitbro ved krydsningen med Allévejen. Paa denne maade ville man faa en fraløbskote paa højst 7.55 m, der ville være 0.27 m fri under hjulet, og der ville være sikkerhed imod at faa Stampemøllen druknet under regnskyl, et tilbagevendende fænomen i øjeblikket.

Bredden af malekarmen kan nu beregnes, for naar højden er maalt fra yderside ramme til yderside ramme, da maa bredden vel ogsaa være det.

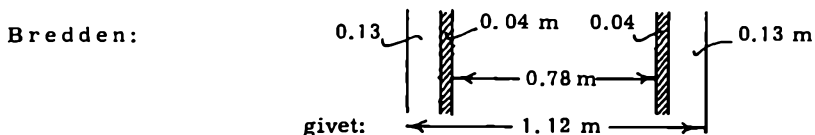


Fig. 48

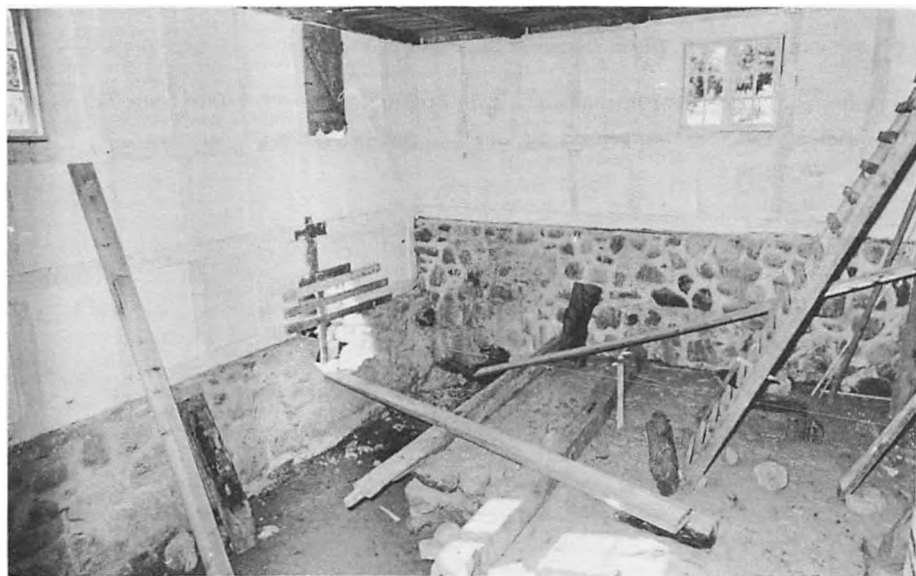


Fig. 14: neg. 379.28: 06-10-47: Kværnloftet brugt som pulterkammer i Svanninge.
The stone floor used as a box room in Svanninge.

Fig. 15: neg. 1768.31: 08-05-65: Den færdige Stampemølle i Aarhus (fraset ham-
meren over stamperammen).

The completed Fulling Mill in Aarhus (the lintel on the fulling frame missing).





**Fig. 16: neg. 1725.10: 17-07-64: Det tomme rum i den genrejste Stampemølle.
The empty room in the re-erected Fulling Mill in Aarhus.**

**Fig. 17: neg. 1726.03: 06-08-64: Monteringen af maskineriet begyndt.
Erecting the milling plant has commenced.**



Malekarmen bliver følgelig (med samme dimension træ) 0.78 m bred eller netop som vandhjulet (0.79 m, formentlig mellem buerne).

Bredden paa selve buerne tages fra min opmaaling af det sidste hjul, $S = 0.20$ m, og nu kan vandhjulets effekt og vandforbrug beregnes:

$$h = 0.74 \text{ m}$$

$$D = 3.30 \text{ m}$$

$$\underline{\text{bund}} = \underline{0.04 \text{ m}}$$

$$F = 4.08 \text{ m} = 15.72 \text{ m} - 11.64 \text{ m}$$

$$\text{Vandstraalens hastighed } V_o = \sqrt{2 g 0.74} = 3.8 \text{ m/sekund}$$

$$\text{Hvis bremsekoefficienten incl. tab i slidske sættes } \Psi = 0.5$$

$$\text{faas vandhjulets periferihastighed } \Lambda_o = 3.8 \times 0.5 = 1.9 \text{ m/sekund}$$

$$\text{Vandhjulets vandslug bliver brutto: } 1.9 \times B \times S = 1.9 \times 0.79 \times 0.2 =$$

$$0.3 \text{ m}^3/\text{sekund}$$

Men skovlene tager plads, og man vil ikke fylde hjulet helt "klokken 12", da det saa spildes allerede ved "klokken 3". Der regnes med en netto-fyldning β paa 0.5, altsaa $0.3 \times 0.5 =$

$$0.15 \text{ m}^3/\text{sekund}$$

eller $150 \text{ l/s} = 150 \text{ kg vand/sekund}$.

$$\text{Den indicerede effekt bliver da } E_i = \frac{150 \times 4.08}{75} = 8.16 \text{ hk,}$$

men der kan højest regnes med 70 til 80 % heraf som nyttigt effekt til møllen, hvorfor den optimale, effektive effekt bliver:

$$E_o = 8.16 \times 0.75 = 6.1 \text{ hk}$$

naar vandhjulet ikke hænger i bagvand! Det nuværende bagvand reducerer skøns-mæssigt effekten til omkring det halve: 3.0 hk.

ad 10) Brandtaxationsprotokol for Svanninge Sogn, Salling Herred, K 1857-1871. (Landsarkivet for Fyn):

Fol. 481: Aar 1869 Løverdagen d. 20 Mai Kl. 9 Formiddag indfandt Branddirectoren sig i Grubbemølle i Svanninge Sogn for ifølge Begjering af Godsforvalter Sandagger at foretage Taxation til Indtegning i Landbygningernes almindelige Brandforsikring af et samme Steds indrettet fransk Sigteværk.

Amtstaxationsmændene Møllebygger og Jernstøber L. Jensen og Tømmermester H. Petersen af Faaborg, samt Reqvirenten vare tilstede.

.....
Samme Dag indfandt man sig i en i Svanninge Sogn værende Stampe og Vindmølle (maa være fejlskrivning for Vandmølle) for at taxere det i samme værende Stampeværk.

Reqvirenten Godsforvalter Sandagger og samme Taxationsmænd vare tilstede.

Forretningen blev fremmet som følger:

262. Stampemølle paa Svanninge Mark, Matr.No. 76 under Steensgaard Gods.

a, Stuehus og Møllehus, Bdv. Strtg. gl. Assurance 630

Malekarmen gl. Assurance 100

Møllehjul gl. Assurance	200
Det i Lt. a værende Mølleværk, gl. Assurance	700
b, Stuehus i Vest Bdv. Strtg. gl. Assurance	420
c, i Lt. a er indlagt et Stampeværk med 4 Hammer med tilhørende Trug af Eg og Bøg, taxeret til	250
	<u>2300</u>

Bygningerne ere ældre men vel vedligeholdte, hvilket og er Tilfældet med Mølleværket, Stampeværket er aldeles nyt.

Bygningerne er forsvarlig indrettet mod Brandfare og har hidtil været forsikret under N. 35 for 2050 Rd., som nu udgaar.

De ligge over 100 Alen (62.8 m) fra nærmeste fremmede Bygning. Rekvirenten erklærede sig tilfreds med den passende Vurdering, som Mændene erklærede at have foretaget efter Samvittighed og bedste Skjøn, saaledes at de med Eed kunne bekræfte samme.

Saaledes passeret bekræfter med Underskrift.

C. N. Wiborg - L. Jensen - Sandagger - H. Petersen.

For Forretningen betalt

til Branddirecteuren	1 Rd. - Mk.
til Mændene hver 4 Mk.	1 Rd. 2 Mk.
Stempelafgiwt	- Rd. 1 Mk.
	<u>2 Rd. 3 Mk.</u>

skriver to Daler og tre Mark. Befordring beregnet under foregaaende Forretning.

C. N. Wiborg.

Kommentar:

At "Stampeværket er aldeles nyt" er uden sammenligning den vigtigste oplysning i denne taxation. Her kan vi have forklaringen paa, at der intet nævnes om stampeværket i 1864-taxationen, men om vi skal tolke dette som en genopbygning af stampeværket fra grunden i 1869, eller om der blot er tale om at sætte et nyt værk til den eksisterende axel, derom ved vi intet sikkert. Men naar man gaar fra 6 stamper i 1824 til 4 i 1869 for til slut at have 6 stamper igen omkring aarhundredeskiftet, tyder en del paa, at den samme axel kan have været med hele tiden, idet man maa forestille sig, at det er stampekarret, der først gaar til.

Støbejernselementerne i gearet stammer sikkert fra 64/69 perioden. Det er betegnende, at den ene af taxationsmændene er "Møllebygger og Jernstøber"; tør vi gætte paa, at det er denne mand, der har udført begge ombygninger ?

Konklusionen

maatte derfor blive, at man lagde sig fast, ikke paa den oprindelige udformning fra 1824 med een kværn og 6 stamper, ikke heller paa situationen i 1864 med 2 kværne og (formentlig) en "gold" stampeaxel, men paa situationen efter 1869, hvor der paany er kommet 6 stamper og med vandhjul/malekarm som beskrevet

saa præcist i 1864. Saaledes kan møllen have set ud i sidste trediedel af aarhundredet, hvor den naaede sin største udbygning. Mette Hansen skriver i sin artikel om Svanninge Stampemølle (L 226) at de sidste to stamper blev tilføjet af Skibsbygger Hans Illum mellem 1874 og 1879. Der opgives ingen kilde til denne oplysning.

ad 11) Mine egne undersøgelser i Stampemøllen i tidsrummet 1944 til 48, da møllen en kort tid fungerede som savmølle (via stampeaxlen), skal kort refereres:

Vandhjul:	A. J.	Engqvist 1952	Taxation 1864
Diameter:	3. 20 m	3. 20 m	3. 30 m
Bredde:	1. 05 m	1. 00 m	0. 79 m
Krans (S):	0. 20 m	0. 20 m	?

Paa Arkitekt Engqvists skitse af loftplanen er noteret:

"Møllehjulet ombygget af tømrer Enemærke ca. 1910 hjulet blev da gjort bredere og diameteren mindre."

Man kunne tænke sig, at forøgelsen af vandhulets bredde ved den omtalte udskiftning i ca. 1910 fra 0. 79 m til 1. 00 m kunne være modsvaret af en indsnævring af buernes bredde (S). For at give vandhullet det samme vandslug skulle 1864-hjulet saa have haft 25. 2 cm brede buer, hvilket er højst rimeligt. En ændring som den skete kan være dikteret af ønsket om at spare paa det brede, krumvoksede egetræ til buerne, samt af ønsket om at faa vandet hurtigere ind og ud af skovlene. Vi ved naturligvis intet sikkert om disse dispositioner, men maaske burde man overveje at gøre vandhulets buer 10" dansk = 26. 1 cm brede ved næste udskiftning af hjulet i aar 2000 (!) Herved ville effekten stige fra 6. 1 hk til 8 hk, og vandforbruget fra 150 l/sekund til 190 l/s. Et fremtidigt pumpeværk bør følgelig dimensioneres til ca. 200 l/s ~ 12 m³/minut ~ 720 m³/time. Denne vandmængde kan naturligvis godt udnyttes af det nu konstruerede vandhjul, blot bliver virkningsgraden lavere.

Geartøget:

vandhjul: 3. 30 m i diameter (vandhjulsaxel)

gravhjul: 67 kamme (støbejern)

kronndrev: 30 kamme (velle) stampedrev: 31 kamme (st. axel)

stjernhjul: 64 kamme 3 knaster/stampe x 6
stamper = 18 løft/rev

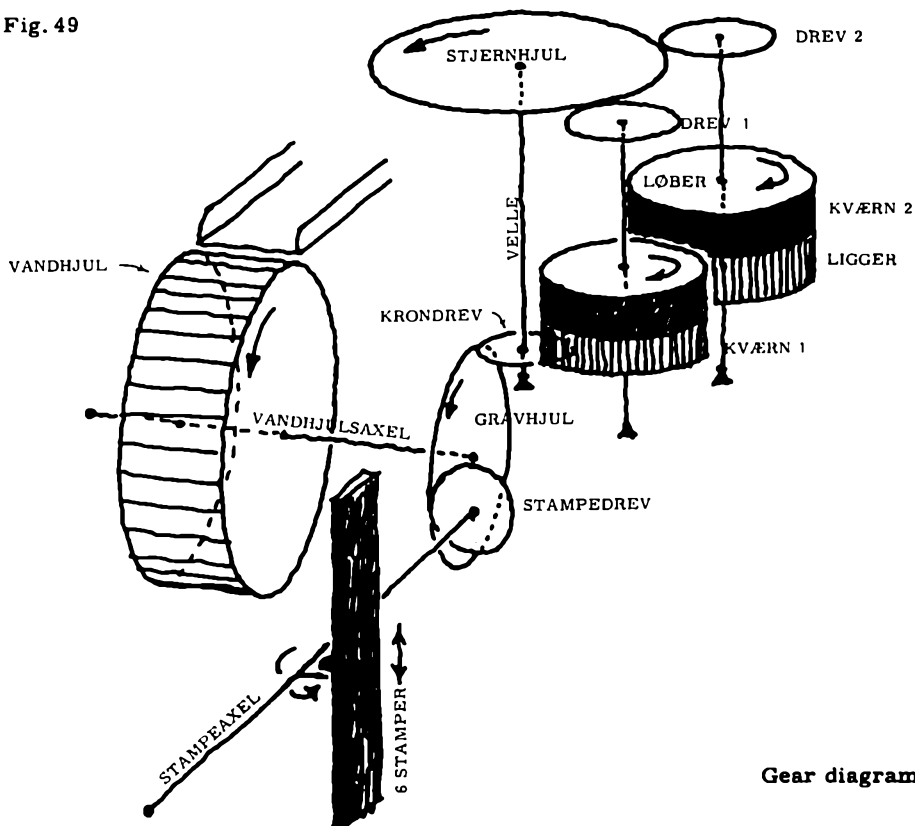
kværndrev₁: 25 stokke kvdrev₂: 27 st. (langjern)

kværn: 1. 10 m diam. 1. 20 m diam.

~~rhinsk tuff~~ ~~kunststen~~

rhinsk tuff kunststen

Fig. 49



Gear diagram

Ved besøget i Svanninge fandtes kværnstenen et eller andet sted paa ejendommen, og drevets ene plade var havnet som hjul paa en trillebør (!) hvorfra tallet til diagrammet hentes. Paa diagrammet er medtaget kværn 2, som den nu er opstillet i Aarhus. Af denne kværn var der kun spor i loftets tømmer ifølge Engqvists tegninger, desværre var begge tapbjælker forsvundet.

Paa basis af dette materiale maatte møllen rekonstrueres. Man kunne have ønsket sig mere, men kunne let have haft meget mindre.

Huset var stillet op, og som det skulle vise sig til alt held ca. 17 cm højere end oprindelig forudsat.

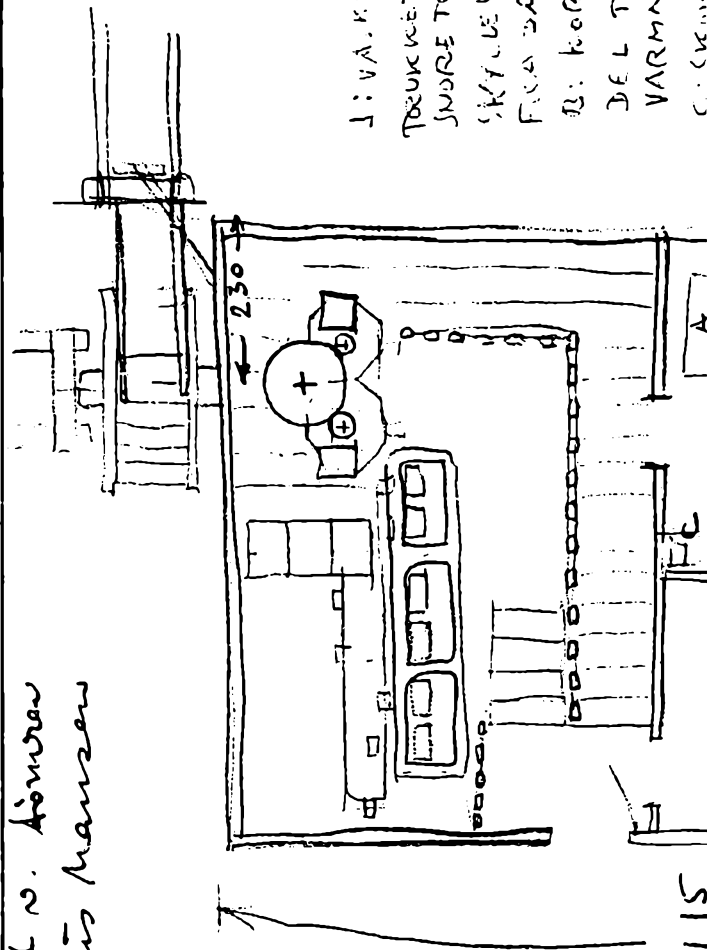
VANDMØLLE

FYN

SVANNINGE STAMPMØLLE

meddel v. tømrer
Rasmus Hansen

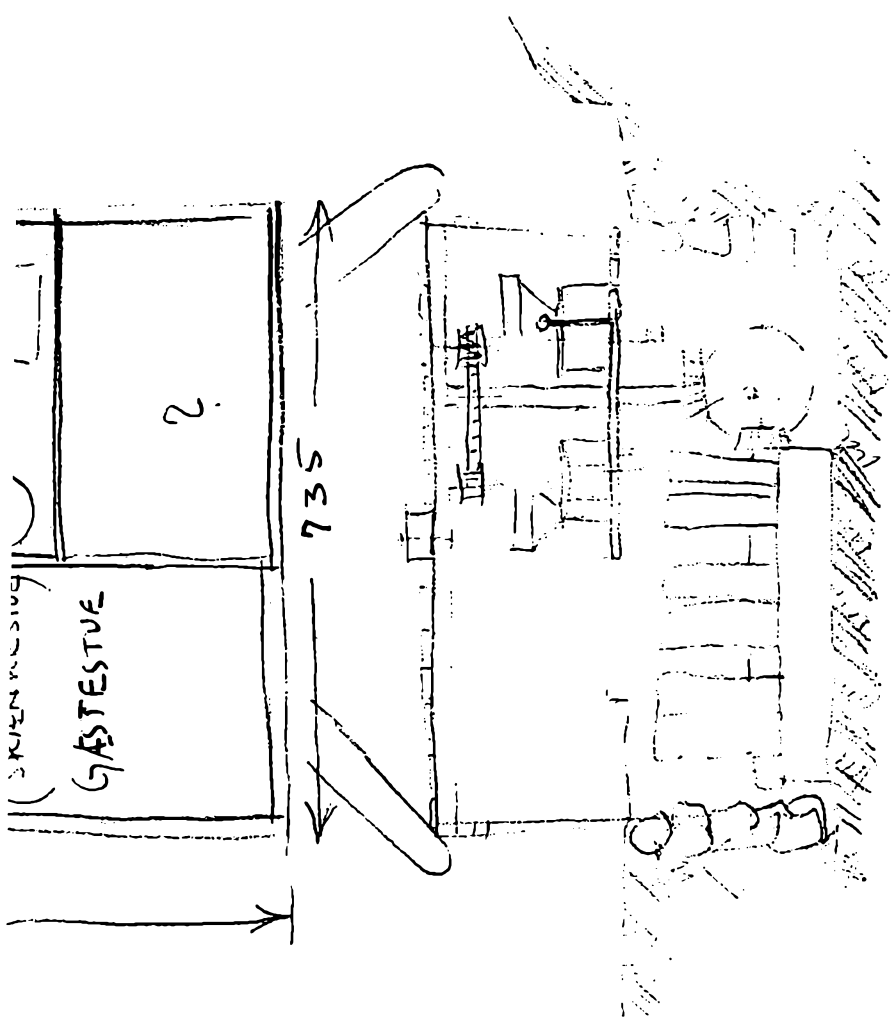
63



J: VÅ. KEMIKALIE
TRUKKET FRA
SINDE TRÅK
SKYLE VAND
FRA DAM
B: KORBERKE
DEL TIL VAND
VARM.
C: SKIVESTRØJ

1115

Fig. 22: Skitse udarbejdet af forfatteren paa basis af interview med Tømrer Rasmus Hansen. Sketch made by the author based on an interview with Rasmus Hansen, Carpenter,



nsen, Svanninge den 05-05-48.
ranninge, date:05-05-48.

110945-1590-A4

Ved løsningen af en saadan opgave gaar man naturligt ud fra det givne og prøver derfra at extrapolere sig ind i det ukendte. Ovenfor er redegjort for rekonstruktionen af de udvendige dele, der kun efterlod tvivl paa eet punkt: vandhjulets buebredde. Gaar vi nu ind i møllen, finder vi det aabne rum i fig. 16. Fra fig. 22, 38 & 39 ved vi, at der har staaet et skæreværk langs væggen. Axlernes placering er nogenlunde kendt fra opmaalingsskitserne, og tilbygningen til skæreværket (anno 1864) kan aflæses paa fotografierne og til dels kontrolleres af det overlevende tappeladstømmer for vandhjulsaxlens indre leje. Placeringen af kværnene kan nu bestemmes. Stjernhulets delecirkel maalttes til 166 cm diameter, og da kan drevets delecirkel beregnes til $\frac{166 \times 25}{64} = 65$ cm diameter. Afstanden fra centrum velle til centrum kværn bliver følgelig $\frac{166 + 65}{2} = 115.5$ cm. Dette gælder kværn 1, som ligger inde i møllen. For kværn 2 nærmest ydervæggen findes paa samme maade centerafstanden til 118 cm. De leverede kværne fra Turup Mølle var 105 cm og 120 cm diameter, men den lille var slidt op og den anden havde kunststen. Vi lagde derfor et sæt andre 110 cm rhinske sten i den lille kværn og bibeholdt stenene i den store.

Hvis vandhjulet gaar 1.9 m/sekund (se ovenfor) bliver kværnens fart:

$$\lambda_1 = \frac{1.9 \times 67 \times 64 \times 1.10}{3.3 \times 30 \times 25} = 3.62 \text{ m/sekund}$$

$$\lambda_2 \text{ udregnes paa samme maade til: } 3.66 \text{ m/sekund}$$

Dette svarer ifølge undersøgelserne i Gearing in Watermills side 30 til gennemsnittet for de overlevende eet-trinsmøller i Danmark, mens de fynske to-trinsmøller ligger paa 6.40 m/sekund. Man kan tænke sig, at møllebyggeren i 1864, da møllen maa formodes ombygget fra eet til to-trin, har opretholdt en uforandret kværnhastighed, uagtet stjernhjulet gav ham mulighed for at forøge farten og dermed møllens male-effekt betydeligt, nemlig ca. 4.4 gange. I fald det fynske gennemsnit skulle have været fulgt, maatte stjernhjulet have haft $\frac{64 \times 6.4}{3.62} = 113$ kamme, hvad der ingenlunde er unormalt i en vandmølle.

Som et koriosum kan nævnes, at DK-11-Brobyværk Mølle, som ombyggedes fra eet til to-trins drift paa omtrent samme tid ogsaa fik en langsom gang, nemlig 3.88 m/sekund, i dette tilfælde fra et underfalds- eller brystfaldshjul. Sandsynligvis har begge møller været ombygget af samme møllebygger. Ogsaa Brobyværk har kamme i sit krondrev, hvor det normale er stokke.

Kværnenes øvrige broværk og dertil hørende letteværk blev opbygget paa traditionel vis af Møllebygger M. P. Petersen, Vester Aaby, Fyn, og han udførte til lige vandhjul og malekarm. Det bløde træ til vandhjul/malekarm blev skaaret af kasserede telefonstænger, skænket af KTAS.

Opstillingen af skæreværket af det gamle tømmer fra Kilde Mølle blev udført af Møllebygger, Civilingeniør Dahlerup fra Allerød.

Det bør nævnes, at til en begyndelse havde vi ikke vellen, men regnede med at bruge den fra Turup Mølle, som kunne kortes ned. En fornyet gennemgang af Den Gamle Bys magasiner afslørede imidlertid en axel, der i længde nøjagtig svarede til Stampemøllens. Det mærkelige var da, at vore 17 cm overhøjde paa huset var sporløst forsvundet. Vellen kunne netop knibes ind mellem vandhjulsaxlen og tapbjælken over skæreværket. Desværre var netop denne bjælke fornyet og de gamle stumper likvideret, saa vi har ingen helt sikker viden om, hvorledes vellen blev styret foroven, men nu er den laast ind i den nye bjælke mens de to kværndrev styres med hver sin løse stikbjælke, alt som vist paa Arkitekt Engqvists skitse af loftplanen. Paa denne skitse er ogsaa vist to huller i loftets brædebeklædning, og herunder maa de to kuber til kværnene have staaet.

Nu er det ene hjørne af møllen "møbleret" og vi kan vove os ud paa det delvis ukendte: **s t a m p e v æ r k e t .**

Placeringen af knasterne passer godt med de dimensioner, Tømrer Hansen opgav for stampernes bredde - naar man regner med en "kulisse"-bredde paa 12 cm mellem hver stampegruppe paa 2 stamper hver. I opbygningen af selve stampeværket fandt vi megen hjælp i materiale udefra:

ad 12) Et sæt bygningstegninger til DK-568-Stampen paa Mølleaaen ved København, beroende i Nationalmuseets Billedarkiv. Materialet er medtaget som fig. 40, 41 & 42 i samme maalestok, 1/100, som tegningerne af Svanninge Stampemølle.

ad 13) S-32-Bodarsjön Stampa, nu genopstillet paa Skansen i Stockholm, se fig. 30 & 34.

Pælefunderingen af stampetruget i DK-568 fik os til at tage alvorligt paa funderingsproblemet her: en svær betonklods blev nedstøbt under stampekarret, dels som fundament, dels som massemodstand for at optage de store kræfter, der udløses, naar stamperne falder i karret. Det ville naturligvis have været muligt at undersøge dette paa stedet i Svanninge, hvis blot ikke ejeren havde opført et nyt hus paa Stampemøllens fundamenter.

Naar stampeaxlens beliggenhed er givet, og stampekarrets størrelse er kendt, kan man paa basis af de kendte stampemøller tegne sig frem til konstruktionen.

Gulvhøjden giver sig selv, og tilsvarende gælder kulissens fastgørelse til skæreværket.

Det stod dog efter det fornyede studium i august 1964 af Bodarsjön Stampa klart, at en 8 cm tyk stampe intet kunne udrette, der maatte en fortykkelse til paa den nederste ende, vi døbte disse "stampehove", og for at give extra vægt og især for at muliggøre en forsvarlig fastgørelse af hæveklodserne, lod vi hovene gaa ca. 1.3 m op. En anden vigtig ting, jeg fandt paa Bodarsjön var den skraa afskæring af de trappeformede stampelødder. Meningen er øjensynlig at underkaste stoffet et vist stræk, saa det ikke ligger og krøller i karret, hvorved det sikkert vil blive ødelagt. Endnu en detaille fra Bodarsjön var de saakaldte "støvleknægte", nogle plader af blødt poppeltræ sat ned langs stampens bagside for at forhindre en opslidning af stampekarrets sidetræ.

Vi fik paa denne maade en maskine, der kunne fungere, men som maaske ligger i overkanten af, hvad møllen kan slæbe. Nu maa man dog forestille sig, at lige saa lidt som en mølle kører med alle kværne paa een gang, lige saa lidt har man kørt med alle stamper paa een gang. Hver stampe kan stilles af ved at gribe den med en jernstang i et hul, naar den kommer i højeste position. Ved at dreje jernstangen lidt ned, løftes stampen helt fri af knasten, og endnu et hul kommer til syne i hvilket man kan anbringe en spærrepind af jern, det var en anden detaille, der fremkom ved besøget paa Bodarsjön.

Ved prøvekørslen, hvor træet endnu var vaadt og ikke tilstrækkelig gennemsmurt, og hvor vandhullet hang i bagvand og vandet ikke stod i flodemaal, kunne vi ikke køre med mere end 2 stamper ad gangen. Tog vi 4 med, kunne møllen gaa i staa, og med kun 2 var den tilbøjelig til at løbe løbsk. Men naar saa kværnen kom med som "ren ohmsk modstand", gik det fint. Maaske ligger her en del af forklaringen paa kværnens placering heri: den virker udjævnene paa gangen, foruden at kornmølleriet naturligvis ogsaa maa have haft en lignende virkning paa økonomien - hvad forøvrigt ogsaa fremgaar af den udvikling, brandtaxationerne kan berette om.

Stampens effektforbrug kan kun anslaaes, da tabene er ukendte:

Selve stampen har et rumfang paa ca	109 liter
mens stampe"hoven" er ca.	<u>89 liter</u>
I alt	198 liter

~ 200 liter. Sættes vægtfylden til ca. 1 for det fugtige egetræ, bliver vægten pr. stampe ca. 200 kg. Løftet kan anslaaes til ca. 0.3 m og farten paa stampeaxlen

$$\text{til } \frac{1.9 \times 67}{3.3 \times \pi \times 31} = \quad . \quad 0.4 \text{ rev/s}$$

Der er 3 løft pr. rev eller $0.4 \times 3 =$	1.2 løft/s
paa hver stampe. Værket har altsaa, naar alle 6 stamper er sat til, et netto-	
forbrug paa $\frac{200 \times 0.3 \times 1.2}{75} =$	0.96 hk / stampe
eller for alle 6 stamper	5.76 hk

Naar stampen ret pludselig skal bringes fra stilstand til fart, vil den stritte i-
 mod, og en del af energien til at overvinde denne inertie vil fremkomme fra
 møllens levende masse - deraf fordelten ved at have kværnen med. Paa vejen
 vil de værste stød udlignes i systemets elasticitet, men heldigvis er det meste
 udført af træ som har et ret højt hysterese-tab, hvorfor skadelig resonans und-
 gaas paa grund af det indre deformationsarbejde i træet. Men dette arbejde be-
 tyder tab, lagt til de formidable friktionstab ved stampens vej op mellem kulis-
 sestyrene. Paa GB-37/418-Ruthven Works fandtes to identiske "beetling plants"
 med hvert sit vandhjul paa henholdsvis 35 og 70 hk. Den eneste forskel mellem
 de to lige store stampeværker var, at den kraftigere side var gearret ca. 20 %
 højere end den anden, og dette nødvendiggjorde altsaa et dobbelt saa kraftigt
 vandhjul (til brug i vandrige perioder).

Vi maa sikkert regne med, at mindst 50 % af den effekt, der tilføres værket gaar
 tabt ved friktion og hysterese, og hver stampe forbruger følgende ca. 2 hk.

Naar der er 6 hk til raadighed, kan man altsaa køre med halvdelen af møllen,
 og konklusionen maa derfor blive, at hvis alle stamper skal køre samtidig, maa
 hjulet udvikle ca. 12 hk, mens man kan køre med to kar og 4 stamper paa et 8
 hk vandhjul, svarende til en buebredde paa 26 cm i stedet for de nuværende 20.

Dette forhold vil forbedres med tiden, efterhaanden som træet tørrer ud og
 smørelsen trænger ind, men meget tyder paa, at 6 stamper er rigeligt for den
 lille mølle, og det er maaske forklaringen paa, at man kun har etableret de
 4 stamper i 1869.

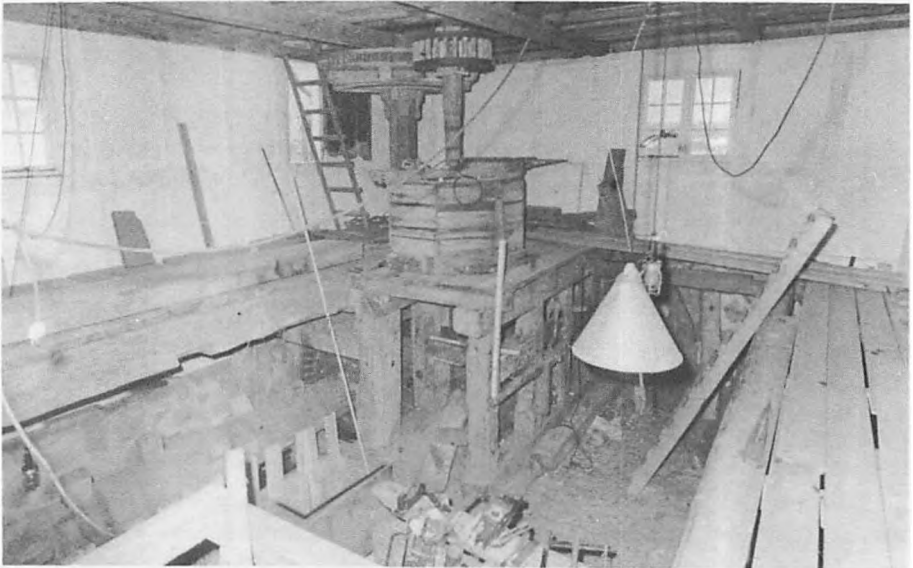
Om rekonstruktionen af stampeværket m.v. er i øvrigt at sige, at Møllebygger
 Dahlerup udførte et fortræffeligt stykke arbejde med opstillingen af skærevær-
 ket og maskineriet indtil han var saa uheldig at falde gennem et brædt paa øver-
 ste loft og brække en arm. Dette skete paa det tidspunkt, som markeres af
 fig. 18.

Arbejdet med stampeværkets opstilling blev derpaa fortsat af Entreprenør Bør-
 ge Hillebrand, Møn, der oprindeligt er udlært som hjulmager og er en meget
 fin haandværker. Hillebrand lavede stampekarret og stillede herover kulisser,



**Fig. 18: neg. 1736.06: 17-10-64: Skæreværket færdigt; montagen af gearet begyndt.
Erection of stone hurst completed; gear installation is in progress.**

**Fig. 19: neg. 1745.10: 12-03-65: Mølleriet monteret; stampeværket under bygning.
Milling machines completed; fulling plant in the making.**



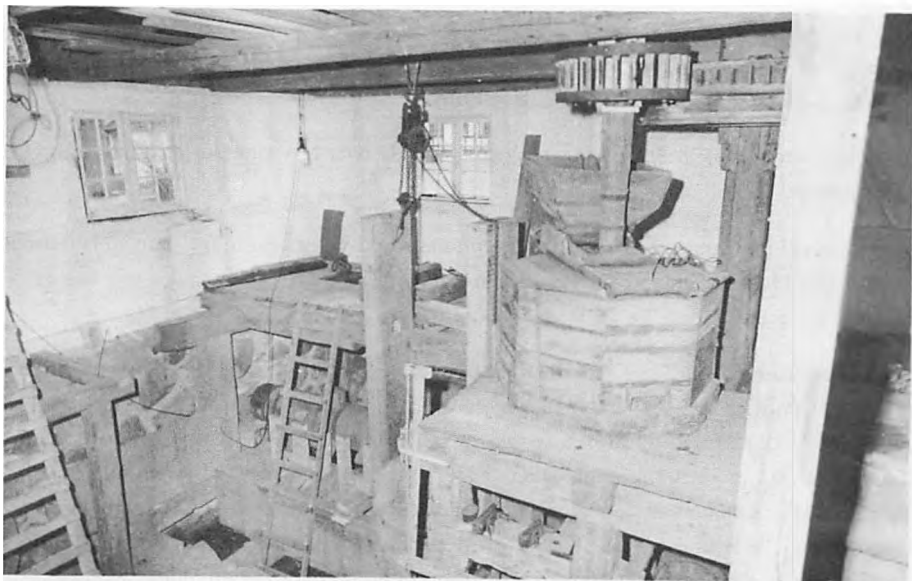


Fig. 20; neg. 1745.14; 25-03-65; Som fig. 19, længere fremme.
As fig. 19, further progress.

Fig. 21; neg. 1768.32; 08-05-65; Det færdige stampeværk i funktion.
Completed plant in operation. The lintel over the fulling frame still missing.



styr og stamper. Den 1. april 1965 kunne de første stamper prøvekøres, og den 10. maj indviedes møllen. Inden da havde Møllebygger Petersen opstillet de to kværne og sat snoretræk til vaskemaskinen.

Træet til stampeværket er nyt og skænkedes af A/S Det Danske Trælastkompagni, Aarhus.

Vaskemaskinen fandtes "i uddrag" i Den Gamle Bys magasiner. Den blev nu repareret af Museets haandværker, Tømrer Carl Jensen, som ogsaa tog sig af de mere snedkermæssige arbejder ved galleri, gulve m. v.

Vaskemaskinen kom til at passe meget fint i format og funktion. Den stammede fra N. Schmidts Farveri, Thorsager, hvor den sikkert har været haandrevet, se fig. 29. Det store drivhjul var imidlertid forsvundet, og i stedet satte vi en snorskive paa, saa maskinen fik en transporthastighed paa valserne paa ca. 1 m/sekund, hvilket svarer til forholdene paa Huntingtowerfield Bleachworks i Perthshire, Scotland (re/ GB-37/416). Klædet syes sammen i en endeløs bane, som bliver ved at løbe gennem valserne og ned i karret nedenunder. Karret manglede ogsaa, men paa fotografiet lignede det oprindelige kar en indigokasse, og hvad var naturligere for et farveri, end at bruge netop en saadan kasse? I karret er enten rent vand eller en opløsning af stampejord, "fuller's earth", det vil sige mergel, hvis kalkindhold saponificerer klædets indhold af fedtstoffer. Maskinens opstilling i bryggerset fremgaar af fig. 26, 27 & 44.

Stampekarret har tre adskilte sektioner, der hver for sig kan afdrænes ved at trække en bundprop. Karret er frit saavel under som fra siderne, men en løs plankebro er lagt helt frem til karrets forkant. Dette er konstrueret ud fra en almindelig arbejdsanalytisk betragtning. Tilsvarende gælder den rhinsksten, der er nedlagt i gulvet nedenfor trappen, netop der hvor stampesvenden kommer med sine spande fulde af kogende sæbevand. Paa den ru møllesten vil hans træsko være mindre tilbøjelige til at glide end paa den glatte stenpikning.

Stampemøllen er nu færdig og kan fungere. Ved indvielsen valkedes et stykke klæde, men processen kunne ikke afsluttes indenfor den lille time det tog at tømme mølledammen. Der forestaar nødvendigvis en periode med efterjusteringer, en periode, hvor man ogsaa kan faa tilføjet de smaating, der endnu mangler, bl. andet overliggeren over kulisserne (udført i vinteren 1965/66 af Børge Hillebrand).

De helt overvejende nødvendige ting er dels en tilfredsstillende vandforsyning paa ca. 200 l/sekund, og dels en bedre afdræning til Møllerup-dammen.

Naar dette er sket, vil Stampemøllen kunne køre kontinuerligt, og de sidste justeringer foretages.

Det vil være gavnligt, om der af og til kan valkes her, men møllen kan ogsaa fungere udmærket som kornmølle, og det samme vand vil derefter kunne drive Møllerup Mølle. Fra Garver-dammen nedenfor Møllerup Mølle kan vandet saa returpumpes til et sted ovenfor Stampemøllen, et samlet løft paa kote 13.00 m - kote 6.00 m = 7.00 m. Regnes med en 200 m plasticledning paa 30 cm diameter, vil transporttabet blive ca. 27 m/km eller ca. 5.4 m for de 200 m ledning. Pumpen skal altsaa levere 200 l/sekund med en løftehøjde paa 12.4 m ialt.

Naar dette system kører, kan man paa Møllerup Mølle have til raadighed ca.:

$$\frac{200 \times 1.3 \times 0.3}{75} = 1.04 \text{ hk}$$

$$\text{hvormed kan formales (byg)} \frac{1040}{22} = 48 \text{ kg/h}$$

Med det nuværende vandhjul paa Stampemøllen kan, naar man overfylder hjulet og derfor maa regne med en mindre virkningsgrad paa ca. 0.7, udvikles

$$\frac{200 \times 4.08 \times 0.7}{75} = 7.6 \text{ hk}$$

$$\text{hvormed kan formales (byg)} \frac{7600}{22} = 345 \text{ kg/h}$$

Den store forskel mellem de to møllers kapacitet ligger dels i den større faldhøjde ved Stampemøllen, dels i den betydeligt højere virkningsgrad i overfaldshjulet end i underfaldshjulet.

$$\text{Til oppumpning af vandet behøves ca. } \frac{200 \times 12.4 \times 2}{75} = 66 \text{ hk}$$

svarende til et elektricitetsforbrug (motortab medregnet) paa 48.5 kW

Med en el-pris paa 12 øre/kWh bliver driftudgiften ca. 6 kr/time.

Vandløbet, som passerer disse to møller, er kun en lille bæk, der er saa uheldigt stillet, som en møllebæk kan være: den faar kun tilløb af overfladevand fra parken og fra Ringvejen, det vil sige, at om sommeren er den saa godt som tør, men under et regnskyl kan der komme op mod et par m³ pr. sekund, som dels kan oversvømme Stampemøllens underste gulv og dels kan efterlade større sandmængder, naar vandet trækker sig tilbage igen.

Gennemgravningen nedenfor Stampemøllen vil fjerne dette problem, og selv om returpumpningen ikke i sig selv vil skaffe mere vand i vandløbet, vil den gøre det vand, der er, adskilligt renere ved den iltning, vandet udsættes for ved at passere de to vandhjul. I særligt tørre perioder kan man maaske tilsætte 10 % vandværksvand til returvand.

Tilbage staar at takke Den Gamle Bys Direktion og Bestyrelse for den tillid man har vist mig ved at betro mig afslutningen af denne spændende opgave og at anerkende det fortræffelige arbejde, der er udført med genrejsningen af huset, at takke haandværkerne for det udmærkede samarbejde og at rette en varm tak til Direktør Brahe-Christensen, der sikrede Svanninge Stampemølle til Købstadmuseet og som siden har været særdeles aktiv for dens genrejsning. En særlig tak til Aarhus Kommunes Stadsgartner for at have accepteret den nuværende placering, der passer saa godt som den gør med den oprindelige beliggenhed i Svanninge. Møllen kunne ikke være placeret noget bedre sted indenfor Museets omraade. Udgifterne til Stampemøllens flytning og genrejsning stammer i det væsentlige fra Textilfabrikantforeningen samt fra Aarhus Kommune, Aarhus Oliefabrik, Andelsklædefabriken Grindsted, og Korn & Foderstofkompagniet.

Anders Jørgensen.

17-12-65



Fig. 1: neg. 17.06: 31-03-39: DK-63-Svanninge Stampemølle set fra syd. Til venstre stuehuset, til højre vandmøllen. Billedet findes ogsaa paa omslaget.

Svanninge Stampemølle from the South. On the left: residence, on the right: the watermill. In the background: Svanninge Church. This motif is also used as cover.



THE RECONSTRUCTION OF THE FULLING PLANT IN SVANNINGE STAMPEMØLLE, NOW IN THE OPEN AIR MUSEUM "DEN GAMLE BY", AARHUS, DENMARK

Svanninge Stampemølle was erected 1824 in the Parish of Svanninge near Faaborg on the island of Fyn. The mill was in operation as a combined flour- and fulling mill until some time between 1900 and 1914. A long period of rest was followed by a short activity as a saw mill in 1938, and after the last war the building deteriorated rapidly. It was in the nick of time that - upon the initiative of Brahe Christensen, Director - the mill was secured for removal to the Borough Museum "Den Gamle By" in Aarhus, Jylland.

Dismantling the building in 1952 was conducted by H. H. Engqvist, Architect, M. A. A., Lecturer to the Royal Academy of Fine Arts, Copenhagen. The dismantling of the milling plant was explicitly excluded from the responsibility of Mr. Engqvist.

Re-erecting the fulling mill took place in 1962 - 5. The building was conducted by the architect of Den Gamle By, Mr. Aage Kristensen, M. A. A., using the drawings produced by Mr. Engqvist. By letters dated 24-08-63 and 28-02-64 the reconstruction of the plant was trusted with me as the technical consultant of the Danish National Museum Mill Preservation Board.



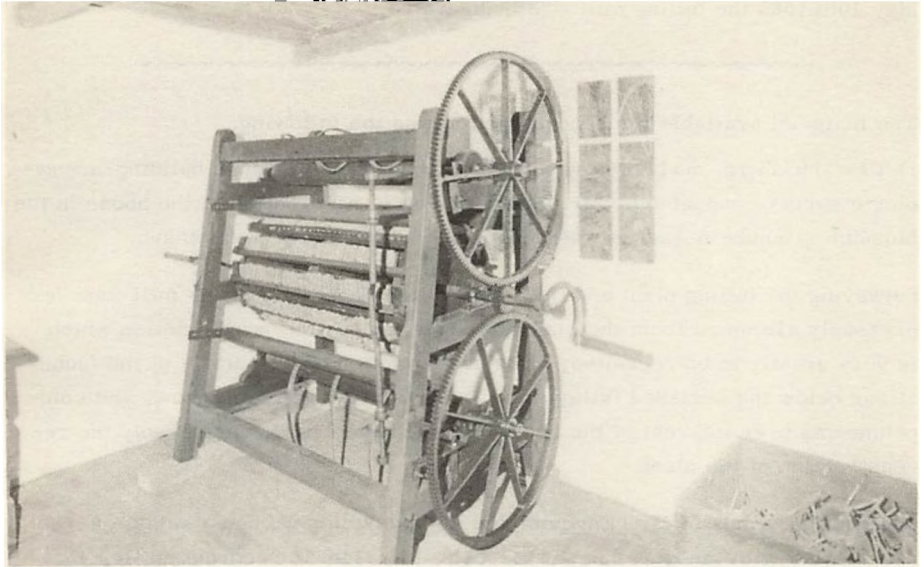
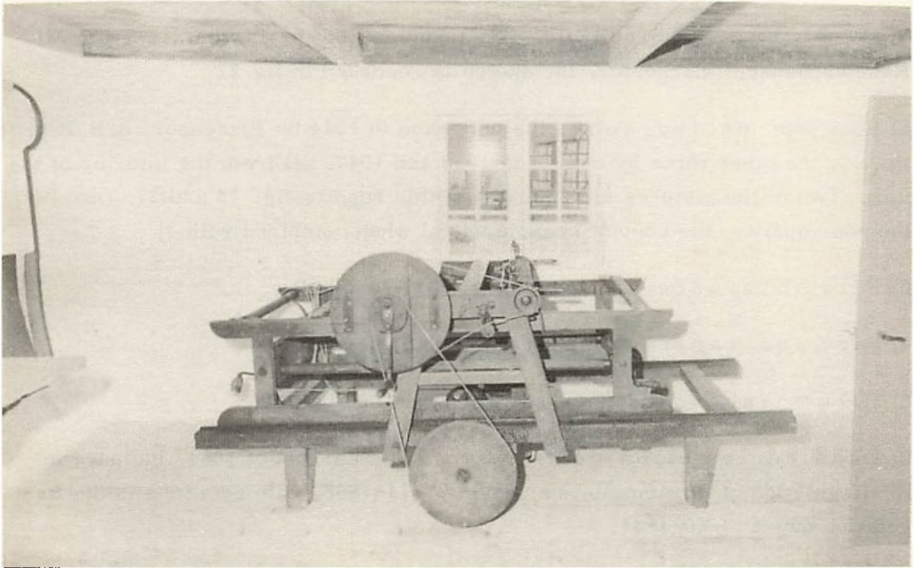


Fig. 24: neg. 1768.37: 08-05-65: Ruemaskine. Roughing machine.

← Fig. 23: neg. 1768.34: 08-05-65: Stampeværket prøvekøres.
Testrunning the fulling stocks.

Fig. 25: neg. 1768.35: 08-05-65: Overskæremaskine. Paa væggen det gl. redskab.
Trimming machine. On the wall: the old implement.



May 10th 1965 the fulling mill was inaugurated.

The material available for reconstruction was the following:

1) The fulling mill was re-erected upon a very thorough building-archæologic survey conducted by Mr. Engqvist, while re-erection of the house in the Museum grounds in Aarhus was supervised by Mr. Aage Kristensen.

Surveying the fulling plant and the other mechanical parts of the mill was expressly exempted from the mandate of Mr. Engqvist - a restriction which is very greatly to be regretted, as an investigation, particularly of the foundations below the perished fulling tub - executed with the same care, and competence as over the rest of the house - would have eased considerably the reconstruction of the plant.

2) From the hands of Mr. Engqvist and his assistants we had a serial of sketches with measurements, the most important is recorded in fig. 43. Further, a complete set of erection drawings, which formed the basis of figs. 43 ··· 46.

3) Two photographs, fig. 38 and 39, taken during dismantling in 1952, nobody knows by whom. The photographs are the property of Den Gamle By, and they became our key witnesses.

4) My own survey of 05-05-48, taken down after an interview with Mr. Rasmus Hansen, Carpenter, the sketch is recorded in fig. 22.

5) Four poor photographs, the one taken in 1944 by Professor, S. B. Böcher, Ph. D., the other three by myself in 1938 and 1947, all from the interior of the mill. Two of the pictures are included in this report, fig. 14 and 37. Despite the poor quality, the content became useful when combined with 3)

6) Fire insurance valuation of 1825, see below.

7) Fire insurance valuation of 1845, see below.

8) Fire insurance valuation of 1864, see below.

9) Land reclamation commission decision of 1864, included in the Regulation of Hornemøllebæk, dated 27-11-1865, with additions in the Regulation dated 18-06-1931.

- 10) Fire insurance valuation of 1869, see below.
- 11) My own measurements of the wheels of 1944 to 8, see below.
- 12) Drawings for a fulling plant in DK-568-Stampen, see below.
- 13) Photographs of S-32-Bodarsjön Stampa (fulling mill), Skansen, Stockholm, followed by a renewed visit, see fig. 30.
- 14) Material evidence:
14. 1) Waterwheel shaft,
 14. 2) Remains (unrepairable) of waterwheel,
 14. 3) Pit wheel, wood with cast-iron cog-segments bolted on,
 14. 4) "Vellen" (the upright shaft),
 14. 5) Wallower (wood),
 14. 6) Spurwheel,
 14. 7) Wyper shaft with some wipers intact,
 14. 8) Wallower on this shaft (cast-iron with wooden cogs),
 14. 9) Bearing blocks for horizontal shafts,
 14. 91) Some of the planks from the stone hurst (the hurst timber itself had disappeared),
 14. 92) Parts of the railing,
 14. 93) Miscellaneous stairs, and some timber from the gallery.

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re 1) Based on Mr. Engqvist's material and on an analysis of 2) ···· 14) has been produced a set of drawings included in this report as figs. 43 ··· 46. These drawings governed the reconstruction of the fulling and milling plant. The house is 7.38 m broad, and 7 bays = 11.10 m long. The drawings of the plant were meant for guidance only, as we considered it most advantageous wherever possible to use material from other, demolished, mills rather than new timber.

Very conveniently the timber from the very beautiful and sturdy mill, DK-53-Kilde Mølle - built on Fyn by the Ravnholt Estate - became available when the house blew down in a gail during the winter 1963/4.

Likewise two mill stones were offered the Mill Preservation Board in 1964 from DK-35-Turup Mølle near Assens on Fyn. Mr. Jørgensen, the owner, had died, and Mrs. Jørgensen very kindly donated the machinery for mill restorations elsewhere, as she intended to sell the property. This mill was not worthy of preservation as an entity, due to a thorough renovation earlier in this cen-

tury, only the corner where the stone hurst was standing was original.

re 4) Mr. Rasmus Hansen, Carpenter, was ill in bed when Mr. Svend Larsen, Director of the Odense Museum, and I visited him in May 1948. Communication was very difficult, but the sketch in fig. 22 resulted: the mill had had a large, open room with a balcony running along the three walls. Along the fourth wall - the gable where the waterwheel was situated - was placed the stone ledge level with the balcony. This stone ledge was a heavy timber structure supporting the mill stones and parts of the gearing, and undoubtedly the fulling frame had in some way been linked to this ledge for stability.

We were told of the dimensions of the fulling stocks as being 15" x 3" (Danish equivalent of ca. 40 cm x 8 cm, but alas we did not receive information regarding the length. The fulling tub was one alen square or 63 cm x 63 cm. Apart from two pairs of mill stones and six fulling stocks the mill had had some screens for flour and meal situated on the wall towards the waterwheel.

Next door to the mill was a scullery where water had been heated for the fulling tub, and this room had also accommodated a wash mill, driven from the mill by a long, endless rope. Water for rinsing was taken from the mill pond by a tube. The heating vessel was said to be of copper.

re 6) Fire Insurance Valuation Role for Svanninge Parish, Salling J. P. District, B 1812 - 1825 (Landsarkivet for Fyn) (all measurements are translated into metric, the original Danish units may be found in the Danish text. Rdl. or Rbd. are Rigsdaler, the Danish currency unit until 1873 when it was superseded by the krone. 1 Rdl. = 2 kroner. 1 Rdl. = 6 Mark = 96 Skilling. 1 krone = 100 øre. Present exchange value: 1 £ = 19.36 kroner)

Svanninge Stampemølle, pag. 552, January Quarter 1825, 1963, Peder Hansens under the County of Brahesminde, Steensgaard:

a: A wing, South and North, 7 bays, wide 7.54 m, oak timber below (i. e. in the half-timber structure), pine above, bricked walls (i. e. in the wooden framework) of kilned bricks, and thatch. Attic (or ceiling) windows and doors and 1 chimney. Then a wing partly accommodating rooms and partly for the convenience of the fulling and flour works placed therein, and was thus this building, which is erected last year from good, solid, and new materials, valued per bay at 80 Rdl., total ..... 560 Rdl.  
in silver ..... 498 Rdl.  
reduced upon request to ..... 470 Rdl.

b: Fulling and flour plant, placed in Litra A is composed of a complete fulling stock with 6 hammers, and a flour stone, all driven by a waterwheel, and was this plant with all its standing and running implements assessed and valued for 600 Rbd. silver 535 for ..... 530 Rdl.

Not previously insured. Safe against fire hazard. Summa 1000 Rdl. silver  
Theile - Lars Hansen - Rasmus Eilersøn - O. L. Trolle

**Commentary:**

Quite obviously the mill was erected the year before this valuation. The date cut in the door lintel "1834" is of much later origin, and not very trustworthy.

There can hardly be any doubt that this is Stampemøllen, as we know it to-day - as far as the building is concerned. But internally the mill is different from the later appearance since there is only one pair of mill stones. We see in fig. 18 and 38 how the original very sturdy stone ledge frame surrounding the pit wheel has later become extended into the middle of the mill. The author is in no doubt that the mill when erected in 1824 had no spurwheel, and one-step underdrive from the pit wheel directly to the stone nut, just as we find it to-day in DK-76-Kaleko Mølle.

We are led to assume that the screen was a box with a "Beutel Sack" as on Kaleko Mølle.

The fulling plant on the other hand corresponds closely to the situation described later, last by Mr. Hansen, the carpenter, and the surviving wyper shaft also shows us that the mill had 6 stocks.

re 7) Fire Insurance Valuation Role for Svanninge Parish and Village, Salling J.P. District, F 1844-1850 (Landsarkivet for Fyn).

Svanninge Stampemølle, pag. 105, 1845, 72<sub>2</sub> now Madam Hansens under Steensgaard Estate.

c: A wing west of "a", 7 bays, width 5.8 m. Oak timber below, pine above, bricked walls, thatch, from South 4 bays for residence with attic (or ceiling) windows and doors, stone floor, chimney and oven. 3 bays for byre and peat house. Assessed and evaluated: 4 bays at 40 Rdl. is 160 Rdl. 3 bays at 25 Rdl. is 75 Rdl. total 235 Rdl. Is the same in silver,

|                                 |           |
|---------------------------------|-----------|
| insured for .....               | 240 Rdl.  |
| Mill, bay 105.28 .... for ..... | 1000 Rdl. |
|                                 | <hr/>     |
|                                 | 1240 Rdl. |

Safe against fire hazard. Wilh. Thejle - Brand - H. Lau - Rasmus Pedersen.

**Commentary:**

We may perhaps assume that the fulling & milling master has lived for 20 years in the mill house itself. By this time he has earned enough to afford to build a residence across from the mill - see on the left of fig. 1.

He can now have an employee living in the mill, It is also possible that the new residence has been erected for the old people now leaving the mill for the next generation, "now Madam Hansens" seems to indicate a widow who may have left the fulling to her son.

It is also possible that the activity has become extended to the further treat-

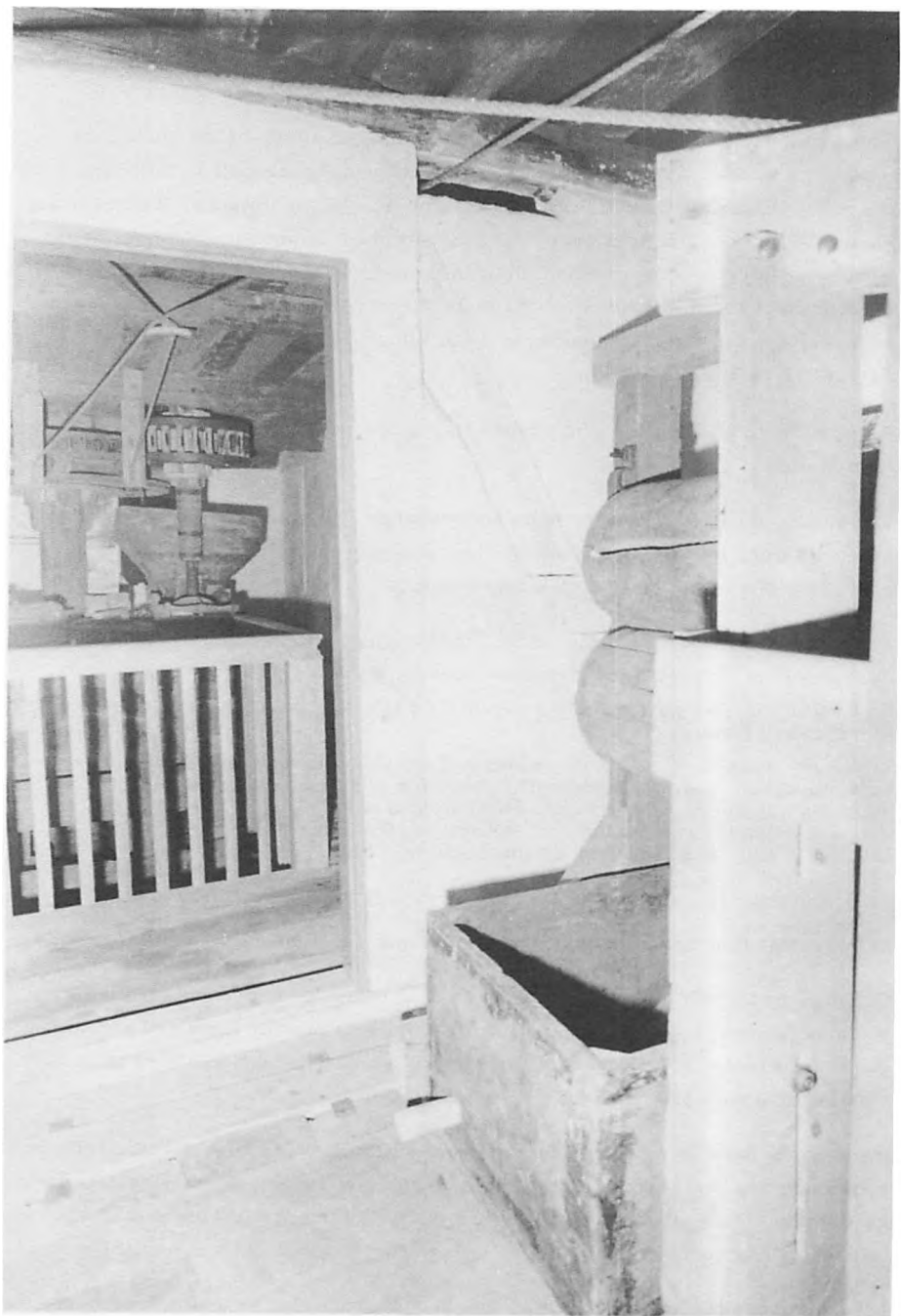




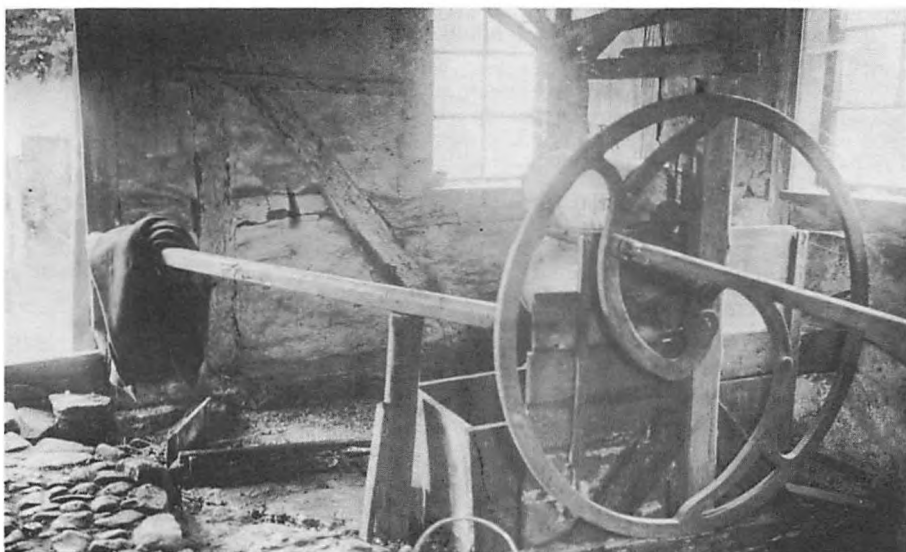
Fig. 27: neg. 1769. 17: 08-05-65: Vaske-  
maskine. Wash mill .



Fig. 28: neg. 1769. 04: 08-05-65: Grue-  
kedel. Heating vessel.

← Fig. 26: neg. 1769. 03: 08-05-65: Kig fra bryggers mod mølle.  
View from scullery towards mill. The wash mill in on the right.

Fig. 29: neg. Gamle By 7939: Vaskemaskinens oprindelige placering i Thorsager.  
Original siting of wash mill in Thorsager. Date of photograph unknown.



ment of the cloth as this has been exemplified in the restoration in Aarhus (the roughing, and trimming machines seen in fig. 24 & 25). Perhaps this development does not come until the last part of the century.

re 8) Fire Insurance Valuation Role for Svanninge Parish, Salling J. P. District, K 1857-1871. (Landsarkivet for Fyn).

Svanninge Stampemølle, fol. 306, year 1864 Decbr. 1st. 3 o'clock P. M. the Fire Insurance Director visited the so-called Fulling Mill situated on Svanninge Field in order to promote said mill re-insured in The Ordinary Fire Insurance Company for Rural Buildings - upon request by Estate Agent Sandagger. The reason for the business was the rebuilding of the milling plant.

Of the valutors elected by the County Council the following were present upon request: L. Jensen, Ironfounder and Millwright, and Henning Hansen, Master Carpenter both of Faaborg, the requisitionerist was also present.

The business was promoted as follows:

167. Stampemøllen in Svanninge Parish under Steensgaard Estate, parcel nr. 76.

a, Wing in South and North, 7 bays, 11.00 m long, 7.38 m wide, and 2.2 m high. Oak timber below, pine above, kilned brick walls and thatch, accommodating from South: room with wooden floor, bed room and kitchen with brick floor, further mill house, attic (or ceiling) over the whole wing with a small room in the attic with wooden ceiling.

In the mill house 2 stories, 8<sup>1</sup>/<sub>2</sub> bay windows with small panes, 3 (possibly only 2) plain and 2 panelled doors inside and are outside with panels.

Valuated 7 bays at 90 Rdl. . . . . 630 Rdl.

A rather new pentrough of oak and pine, 3.76 m long, 1.12 m broad, 1.26 m deep . . . . . 100 Rdl.

A mill wheel 3.30 m diameter, 0.79 m wide of oak and pine . . . . 200 Rdl.

The milling plant referred to in Litra a, composed of 2 pairs of mill stones, screen box with screens and 1 sack hoist &c . . . . . 700 Rdl.

b. Wing West of a, 7 bays, 11.9 m long, 5.81 m wide, and 2.20 m high, from same materials as a with thatch, accommodating from South 2 rooms with brick floor and hall, further workshop with attic (or ceiling) over 2<sup>1</sup>/<sub>2</sub> bays, byre, henhouse and fire wood shed. 3 internal and 3 external plain doors and 6<sup>1</sup>/<sub>2</sub> bay windows with small panes, 1 chimney of kilned bricks.

Valuated 7 bays at 60 Rdl. . . . . 420 Rdl.  
2050 Rdl.

The buildings are rather new and well maintained, and they are safe against fire hazard. They were previously insured under nr. 35 for 1240 Rdl., which is now cancelled. The buildings are placed far more than 62.80 m from the nearest neighbouring building. The requisitionerist declared himself content with the valuation, as the men declared to have conducted upon their best judgment, such as they are prepared to swear in court.

Thus passed, confirmed by our signatures.

C.N. Wiborg - L. Jensen - Sandagger - E. Hansen.

Charge:

|                                           |                     |
|-------------------------------------------|---------------------|
| For the Fire Insurance Director . . . . . | 1 Rdl. 48 S.        |
| For the men . . . . .                     | 2 Rdl. - S.         |
|                                           | <u>3 Rdl. 48 S.</u> |

in writing three Daler and forty and eight Skilling. C. N. Wiborg.

## Commentary:

We receive here a very minute description of the whole plant, particularly of the waterwheel and the pentrough, which has been reconstructed from this, compared with the Land Reclamation Commission decision discussed below. The length of the pentrough had, of course, to be adapted to the topographical conditions in Aarhus, and so the pentrough has become 8 m long against the 3.76 m quoted by the valuation. This is due to the fact that in Svanninge the dike retaining the mill pond behind the mill had a stone wall making it possible to bring the pond nearer the mill. Furthermore, the Svanninge mill pond approached the mill in a wedge, see fig. 1.

There are now two pairs of stones, and naturally these were driven by a spur-wheel exactly as it has been reconstructed in Aarhus.

The screens could have been Beutel Sacks as before, but it is possible that the screens were placed along the wheel side where Mr. Hansen the carpenter told us they were in his day. This is the place where there is best room for these machines, although this location introduces the difficulty that flour must be fed manually from the mill stones, since the mill had no grain elevator. We still have a vacant groove on the spurwheel for the rope drive to the screens, no doubt they were centrifugal screens.

So far we have not been able to find suitable screens, but we have the best hopes. This also goes for the sack hoist, it must have been a manual type, the so called "kransetov", i. e. rim-rope, involving an endless rope travelling on the Y-forks of a wheel fixed to the hoist barrel. There are traces in the floor boards and a beam where this hoist was situated (centre for the gallery, opposite the chimney).

The introduction of the two pairs of mill stones has made an extension of the stone hurst necessary, and for pedagogic reasons this extension is reconstructed in pine, while the "original" parts of the hurst are in oak. This is to exemplify the later trend in this extension at a time when plant specification became more important than the durability of the materials employed (see fig. 18). This policy is well known from other mills of this period.

We may wonder what could have happened to the fulling plant in this valuation. It re-appears later (1869) although with only "4 hammers".

Alterations could of course have taken place, which we can no longer follow. But it is also possible that on principle they insured only what had to be in-

sured. As long as the Mølleprivilegier (State Milling Soke) prevailed, i. e. until 1862, the Soke was in fact a mortgage placed upon the cereal mill by the Crown (later the State). In consequence the owner was obliged to insure this liability in order that the Crown might be spared the loss in case of a fire. But a fulling plant did not require any permission, and therefore needed no insurance. This could be an explanation for the fulling plant - perhaps momentarily out of commission - not being included in the 1864-valuation, the pre-1862 procedure being used by force of habit.

Against this assumption are two pieces of evidence: the one is the change over from scullery to kitchen, and the other we find in the 1869-valuation, which was obviously taken in honour of the "installed fulling plant with 4 hammer(s)". That this machine is described as "entirely new" does not necessarily mean that a more or less redundant plant did not precede it.

re 9) Excerpt Regulation for Hornemøllebæk dated 27-11-1865:

.....  
2. The Flood Gauge for Svanninge Mølle has been settled by the Land Reclamation Commission on December 13th 1864 as follows:

From the bottom of the pentrough shall be 0.74 m upwards to flood gauge level which is then situated 0.21 m below the top of the side lintel of the pentrough. The flood gauge is indicated by a cut in the pentrough, the lower side of which cut is valid.

Likewise was made a cut on the north eastern corner post of the mill house proper, the lower side of this cut is valid as flood gauge.

Both these marks are in level with each other.

The users of both mills (DK-119-Grubbe Mølle is previously mentioned in the Regulation) were notified that they must never make any alterations or repairs by which the flood gauge marks become removed or dislocated, without first notifying the County (Council).

.....  
Exerpt Regulation for Hornemøllebæk dated 18-06-1931:

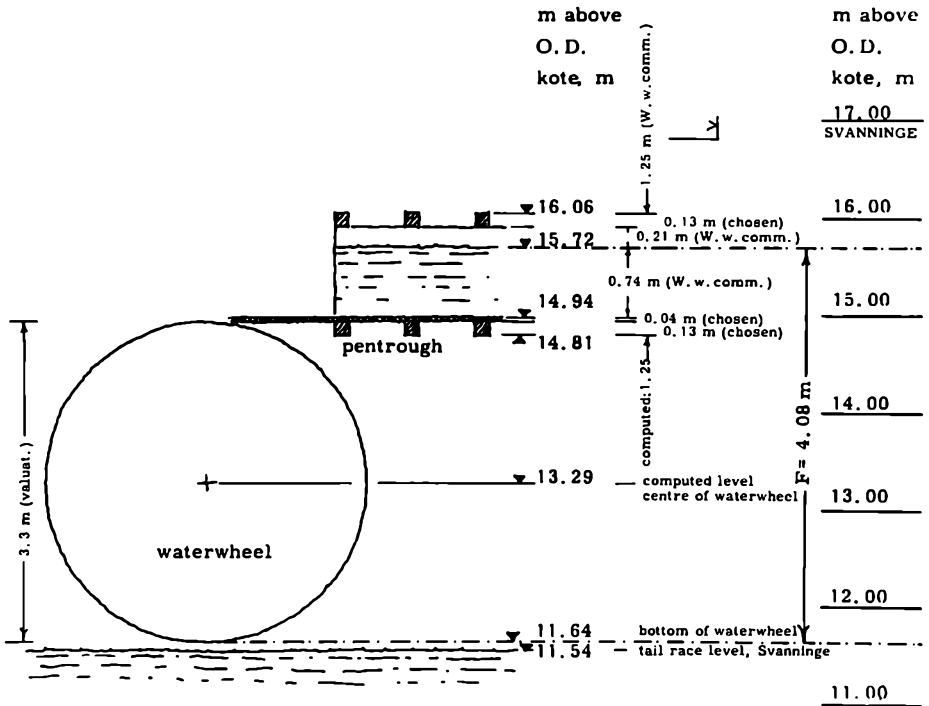
.....  
1. Svanninge Mølle. The flood gauge has been fixed by a Land Reclamation Commission on Dec. 13th 1864. The conditions applying to the pentrough are no longer valid, since the pentrough has since been renewed. On the north-eastern corner post of the mill house proper was made a cut, the lower edge of which is valid flood gauge. This cut is still present, and is situated 15.72 (m above Ordnance Datum).  
.....

Commentary:

If we compare the information contained in these three documents - the two early ones are issued only twelve days from each other - we receive the following picture of the conditions around the waterwheel:



Fig. 47



Unfortunately, no levelling was taken to the mill in its original setting.

In Aarhus the mill building had already been erected, and the flood gauge mark on the house could just be traced as a c. 2 cm broad cut in the corner post nearest the pentrough. The centre of this mark was found to be placed 12.07 m above Ordnance Datum (Aarhus) after re-erection.

The concrete retention wall in Aarhus was placed 12.06 m above O.D., while the overflow from the existing mill pond was in 11.71 m O.D. In the watermill placed below - DK-1386-Møllerup Mølle - the mill pond is in 7.51 m O.D., but this level cannot be utilized by the fulling mill at the moment since the pipe, connecting the two mills, is in 7.66 m O.D. at the lowest point.

In view of the long pentrough, which it must be possible to drain during frost, 2 cm were added to the flood gauge, and it was not considered realistic to place this gauge above the concrete wall. The Aarhus flood gauge was therefore fixed at 11.90 m O.D. or 12.07 m - 11.90 m = 0.17 m below the level of the house already erected. This gave us advantages inside as we shall see later. As far as

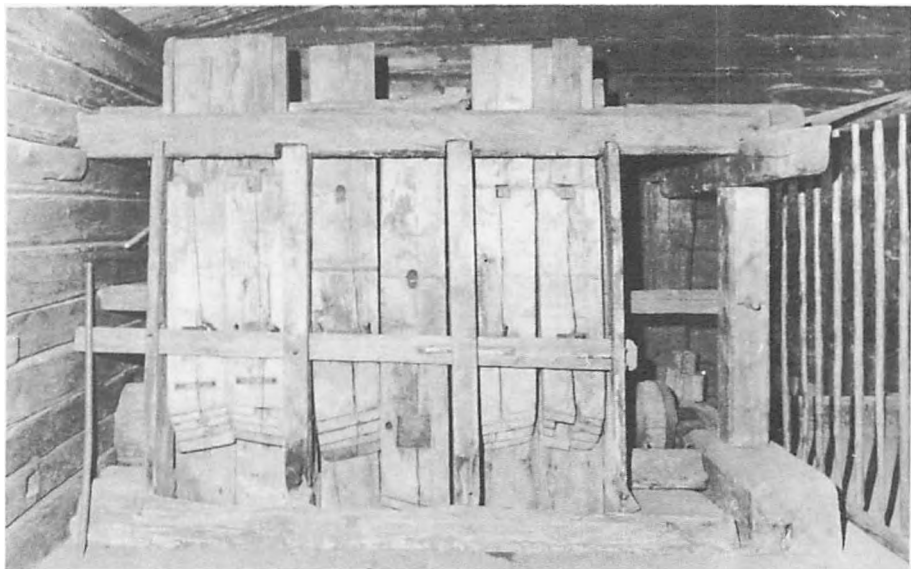


Fig. 30; neg. 1728. 22; 12-08-64; S-32-Bodarsjön Stampa. Stamperammen forfra. Bodarsjön Stampa, fulling frame viewed from the working side.

Fig. 31; neg. 1795. 33; 19-04-66; DK-63-Svanninge Stampemølle; Stampen forfra. Svanninge Stampemølle, fulling frame viewed from the working side.

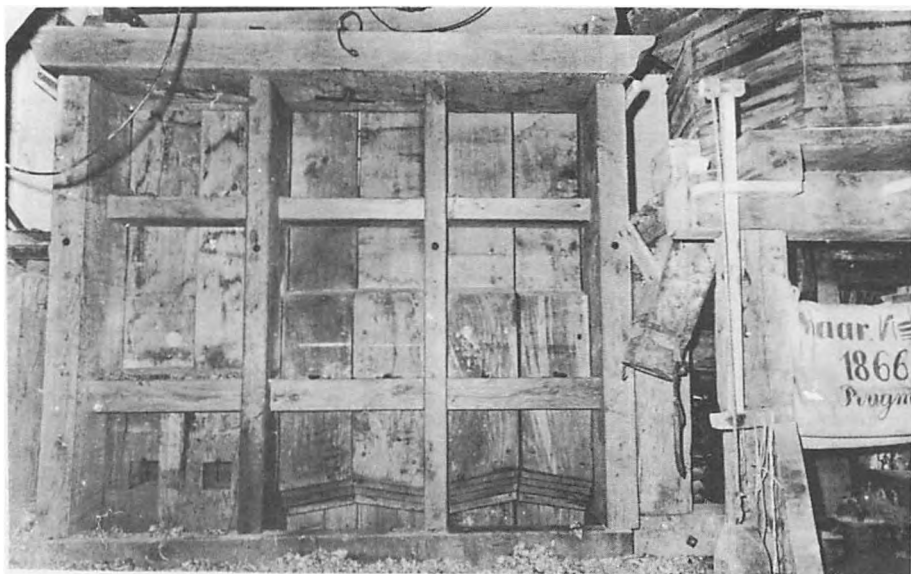




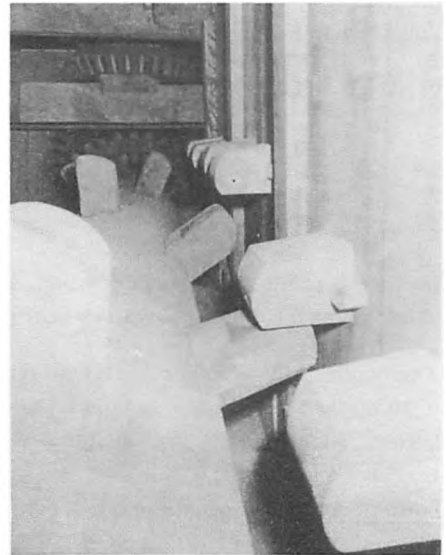
Fig. 32: neg. 17.05: 31-03-39: Vandhjulet igang i Svanninge . . . . .  
Waterwheel working in Svanninge . . . . .



Fig. 33: neg. 1555.09: 10-05-65 i Aarhus paa indvielsesdagen.  
in Aarhus on the day of inauguration.

Fig. 34: neg. 1728.15: 12-08-64: Stampeaxlen paa Bodarsjön . . . . .  
Wyper shaft on Bodarsjön . . . . .

Fig. 35: neg. 1769.10: 08-05-65: paa Svanninge Stampemølle.  
on Svanninge Stampemølle.



the house is concerned we found the difference in level between Svanninge and Aarhus to be:

|                                                      |               |
|------------------------------------------------------|---------------|
| 15.72 m - 12.07 m =                                  | 3.65 m        |
| and for pentrough and waterwheel: 13.29 m - 9.47 m = | <u>3.82 m</u> |
| --- the difference as before .....                   | 0.17 m        |

At present the mill pond is in 11.71 m O. D. (water level), but everything is built to accommodate the possible 11.90 m O. D. Due to the steep gradient of the stream this pond level will not create any trouble in the park, on the contrary, the ugly concrete walls will be submerged, since the dike ought to have a safety height some 0.3 m above flood gauge level, i. e. 12.20 m O. D.

The real problem is that the bottom of the waterwheel is 7.82 m O. D. and is served by a pipe with a theoretical minimum level of 7.66 m O. D. This should give 0.16 m below the wheel, but in actual fact the waterwheel is always hanging in backwater, as water jams in the pipe probably because of silting up.

A permanent solution is to excavate from the Møllerup-pond past the Chemist House and back towards the Fulling Mill, and to establish in the passing a granite bridge at the intersection with Allévejen. In this way the tail race level would be reduced to 7.55 m O. D. , and there would be 0.27 m free below the waterwheel. Moreover there would be a security against having the Fulling Mill flooded by storm water, a recurring phenomenon at present.

The width of the pentrough can now be computed, since we may assume that when the height is being quoted from outside frame to outside frame, it appears plausible that the width is measured in the same way.

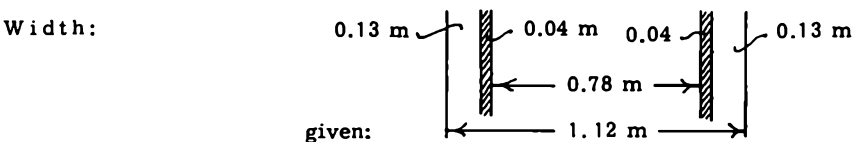


Fig. 48

Using the same dimensions of wood, the pentrough will consequently be 0.78 m broad or exactly like the waterwheel (0.79 m, presumably between the shrouds).

The depth of the shrouds is taken from my measurements of the last wheel, S= 0.20 m, and we can now compute the effect and the water consumption of the wheel:

- h = 0.74 m
- D = 3.30 m
- bottom 0.04 m (of chute)
- F = 4.08 m = 15.72 m O. D. - 11.64 m O. D.

water jet velocity  $V_o = \sqrt{2g \cdot 0.74} = 3.8 \text{ m/second}$

If the breaking coefficient incl. loss in the trough is  $\Psi = 0.5$

the periphery speed of the waterwheel is  $\Lambda_o = 3.8 \times 0.5 = 1.9 \text{ m/s}$

The overall water content of the wheel is:  $1.9 \times B \times S = 1.9 \times 0.79 \times 0.2 = 0.3 \text{ m}^3/\text{s}$

But the buckets take some space, and it is not desirable to fill the wheel completely at "12 o'clock", as some water will overspill already at "3 o'clock". We will restrict the filling coefficient  $\beta$  to 0.5 and the optimal waterconsumption  $q_o$  will then be:  $0.3 \times 0.5 = 0.15 \text{ m}^3/\text{s}$  or 150 litres/second = 150 kg of water/second.

The induced effect will then be  $E_i = \frac{150 \times 4.08}{75} = 8.16 \text{ hp (metric)}$

but no more than 70 to 80 % of this can be extracted as useful effect for the mill, so the optimal, actual effect will be:

$E_o = 8.16 \times 0.75 = 6.1 \text{ hp}$

when the waterwheel is not exposed to backwater ! The present backwater will probably reduce the effect to about half : 3.0 hp

re 10) Fire Insurance Valuation Role for Svanninge Parish, Salling J. P. District, K 1857 - 1871. (Landsarkivet for Fyn):

Fol. 481: Year 1869 Saturday May 20th 9 oclock A. M. the Fire Director visited Grubbe Mølle in Svanninge Parish upon request by Estate Agent Sandagger in order to make a valuation for the insurance in The Ordinary Fire Insurance Company for Rural Buildings of a French flour works installed in this mill.

The County valuator Millwright and Iron Founder L. Jensen and Carpenter Master H. Petersen of Faaborg, as well as the requisitioner were present.

.....  
The same day was visited a Fulling and Windmill (must be a misspelling of Watermill) in Svanninge Parish in order to valueate a fulling stock placed therein.

The requisitioner Sandagger and the same valuator were present.

The business was promoted as follows:

262. Fulling Mill on Svanninge Field, parcel number 76 under Steensgaard Estate.

|                                                                                                                     |             |
|---------------------------------------------------------------------------------------------------------------------|-------------|
| a. Residence and mill house, halftimber, thatch, old insurance                                                      | 630         |
| The pentrough, old insurance .....                                                                                  | 100         |
| Waterwheel, old insurance .....                                                                                     | 200         |
| The milling plant in Litra a, old insurance .....                                                                   | 700         |
| b, residence in West, halftimber, thatch, old insurance .....                                                       | 420         |
| c, in litra a is installed a fulling stock with 4 hammers with appurtenant trough of oak and beach, valued at ..... | 250         |
|                                                                                                                     | <u>2300</u> |

The buildings are older, but well maintained, the same goes for the milling plant, the fulling stock is entirely new.

The buildings are secure against fire hazard and have previously been insured under N. 35 for 2050 Rd. , which is now cancelled.

They are placed more than 62.8 m from nearest neighbouring building. The requisitionist accepted the suitable valuation, which the men declared to have made to the best of their conscience and judgement, such as they are prepared to swear to same.

Thus passed confirmed by our signatures.

C.N.Wiborg - L.Jensen - Sandagger - H.Petersen.

|                            |                    |
|----------------------------|--------------------|
| Paid for the business      |                    |
| to the Fire Director ..... | 1 Rd. - Mk.        |
| to the men each 4 Mk. .... | 1 Rd. 2 Mk.        |
| Stamp Tax .....            | - Rd. 1 Mk.        |
|                            | <u>2 Rd. 3 Mk.</u> |

in writing: two Daler and three Mark. Travelling reckoned under the previous business.

C. N. Wiborg.

.....

#### Commentary:

That "the fulling plant is entirely new" is by far the most important piece of information in this valuation. This may be the explanation for the fulling plant not being mentioned in the 1864-valuation, but we are still in the dark as to whether we face complete re-erection of the fulling plant in 1869, or whether this is just a new stock being connected to the existing shaft. But when they pass from 6 stocks in 1824 to 4 in 1869 finally to have 6 stocks again at the turn of the century, we are lead to assume that the same wyper shaft could have been there all the time, since it is the stocks and the trough which will perish first.

The cast-iron elements in the gear are probably from the 64/69 period. It is interesting to observe that one of the valutors is "Millwright and Iron Founder", dare we guess that this is the man who made both rebuildings ?

~~~~~

Conclusion:

We then decided to resort, not to the original status of 1824 with one mill stone and 6 stocks, not to the 1864 situation with two pairs of stones and (probably) an idle wyper shaft, but to the condition after 1869, where 6 stocks are again in use and with waterwheel/pentrough as described so accurately in 1864. This could have been the status of the mill in the last third of the century when it reached its greatest development. Mette Hansen in her article on Svanninge Stampemølle (L 226) informs us that the last two stocks were added by Ship Builder Hans Illum between 1874 and 1879. No source to this information is given.

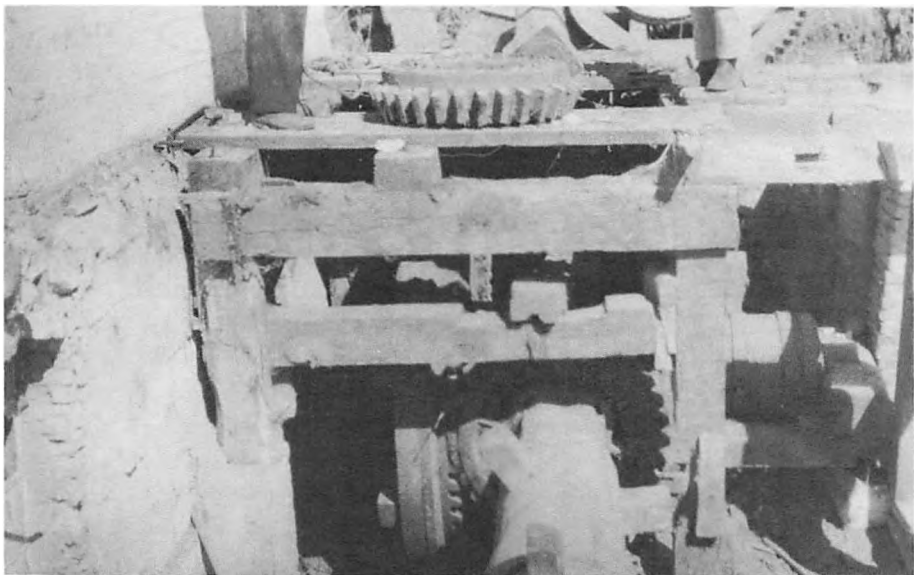


Fig. 38; neg. Den Gamle By 7646; ca. 1952: Kronvidnet, fotografierne fra nedtagningen i Svanninge; ukendt fotograf.

The key witness, the photographs taken during dismantling in Svanninge. Unknown photographer.

Fig. 39; neg. Den Gamle By 7645; ca. 1952: do.

do.

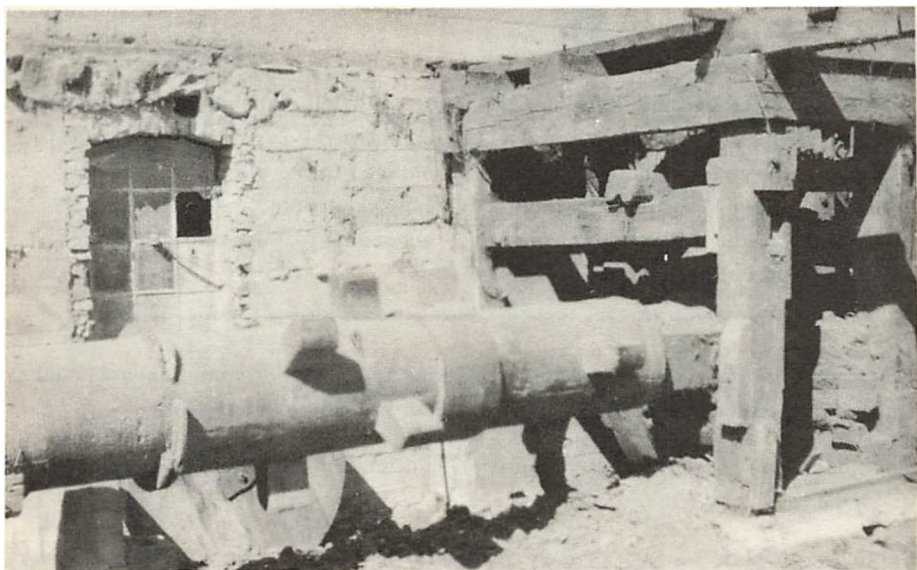
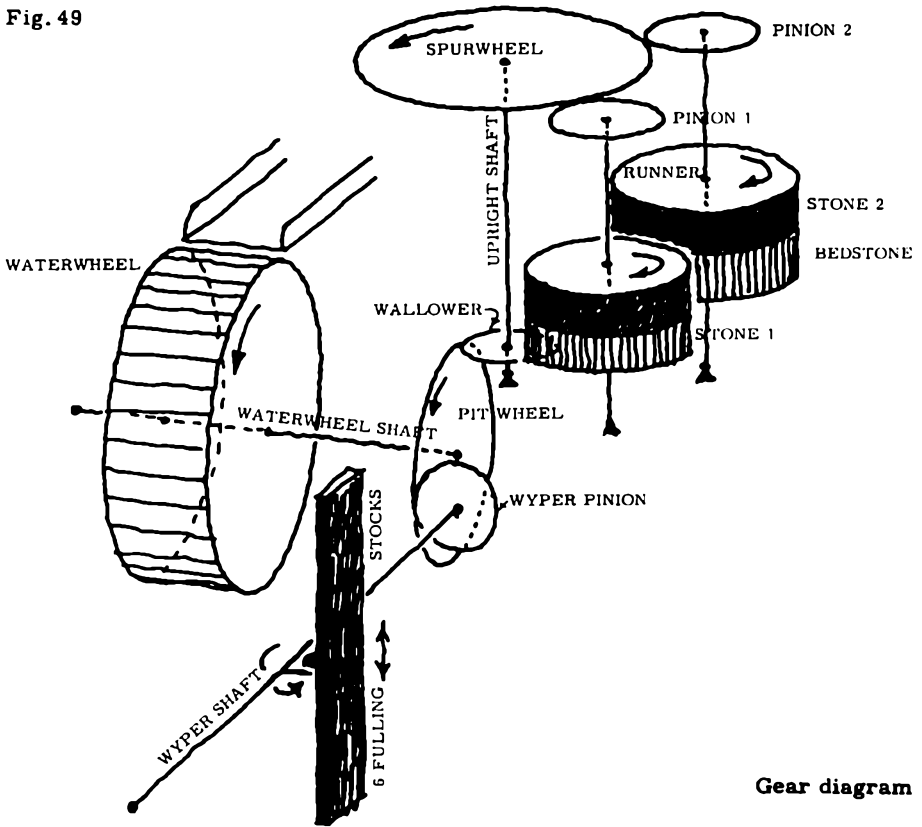


Fig. 49



Gear diagram

At the visit in Svanninge the grinding stone was found somewhere on the property, and the one plate of the stone nut was used as a wheel on a wheel barrow (!), from this piece of evidence the figure has been entered in the diagram. Grinding stone 2 has been entered in the diagram as it is now re-erected in Aarhus. Of this stone only traces in the attic timber remained, according to Engqvist's drawings. Unfortunately both bearing beams had perished.

Based on this material we had to reconstruct the mill. We could have wished for more, but could certainly have been faced with considerably less.

The house was already erected, as it proved luckily c. 17 cm higher than originally envisaged.

Solving a problem like the present it is natural to commence with the evidence

re 11) My own investigations in Svanninge Stampemølle between 1944 and 48, when the mill was functioning for a short time as a saw mill (via the wyper shaft) shall be briefly referred to:

Waterwheel:	A. J.	Engqvist 1952	Valuation 1864
Diameter:	3.20 m	3.20 m	3.30 m
Width:	1.05 m	1.00 m	0.79 m
Shroud (S):	0.20 m	0.20 m	0.?? m

On Architect Enqvist's sketch of the attic plan is entered:

"Waterwheel rebuilt by Carpenter Enemærke c. 1910, wheel was then made broader and the diameter smaller".

It is possible that the increase in width of the waterwheel in 1910 from 0.79 m to 1.00 m could have been compensated for by reducing the depth of the shrouds (S). To give the waterwheel the same waterconsumption the 1864-wheel should then have had 25.2 cm deep shrouds, which is quite plausible. The change in 1910 could have been made to save the broad, crooked oak wood for the shrouds, and promoted by a desire to get water more quickly in and out of the buckets. We do not know anything definite of these changes, of course, but perhaps the next waterwheel should be made 10" Danish = 26.1 cm deep when the wheel is to be changed out again anno 2000 (!) This would increase the effect from 6.1 hp to 8 hp, and the waterconsumption from 150 l/s to 190 l/s. A future pumping plant should, therefore, have a capacity of c. 200 l/s ~ 12 m³/minute ~ 720 m³/h. This amount of water can, of course, be utilized by the present waterwheel, but the coefficient of efficiency would be lower.

Gear train:

waterwheel: 3.30 m diameter (waterwheel shaft)

pit wheel: 67 cogs (cast-iron)

~~~~~

wallower: 30 cogs upright shaft

fulling wallower: 31 cogs wyper sh.

spurwheel: 64 cogs

3 wipers/stock x 6 stocks  
= 18 lifts/rev

~~~~~

stone nut₁: 25 sticks stone nut₂: 27 st.

stone: 1.10 m diam. 1.20 m diameter
blue stone composite

~~~~~

blue stone composite

See the gear diagram, fig. 49, in page 58.

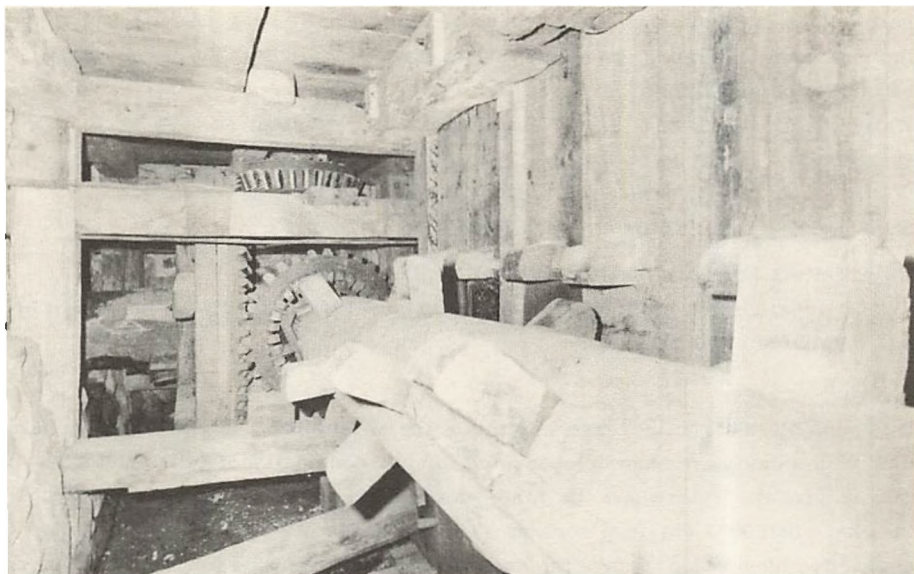
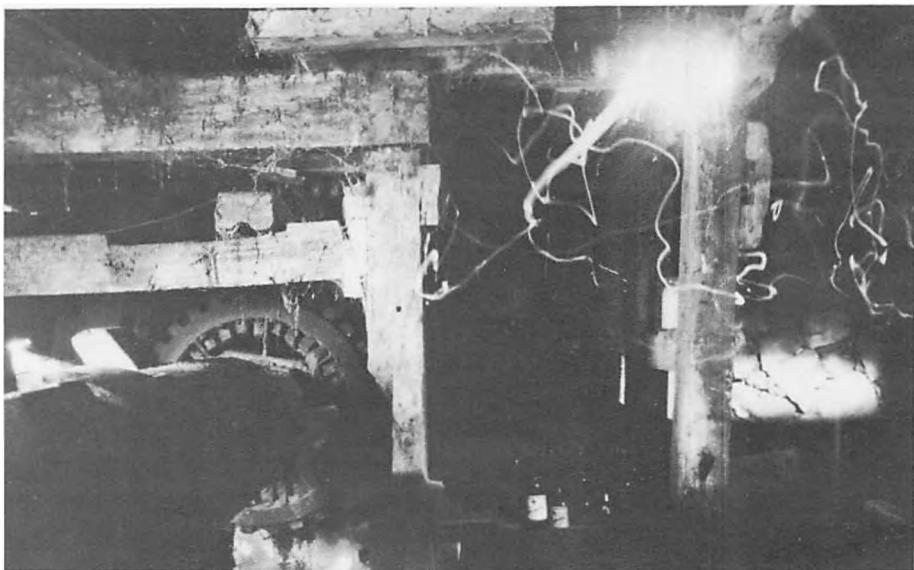


Fig. 36: neg. 1769.09; 08-05-65: Det færdige stampeværk fra løfter-siden.  
Completed fulling plant from wyper side; Svanninge Stampemølle/Aarhus.

Fig. 37: neg. 379.27; 06-10-47: Stampeaxlen i Svanninge.  
Wyper shaft in the basement at Svanninge.



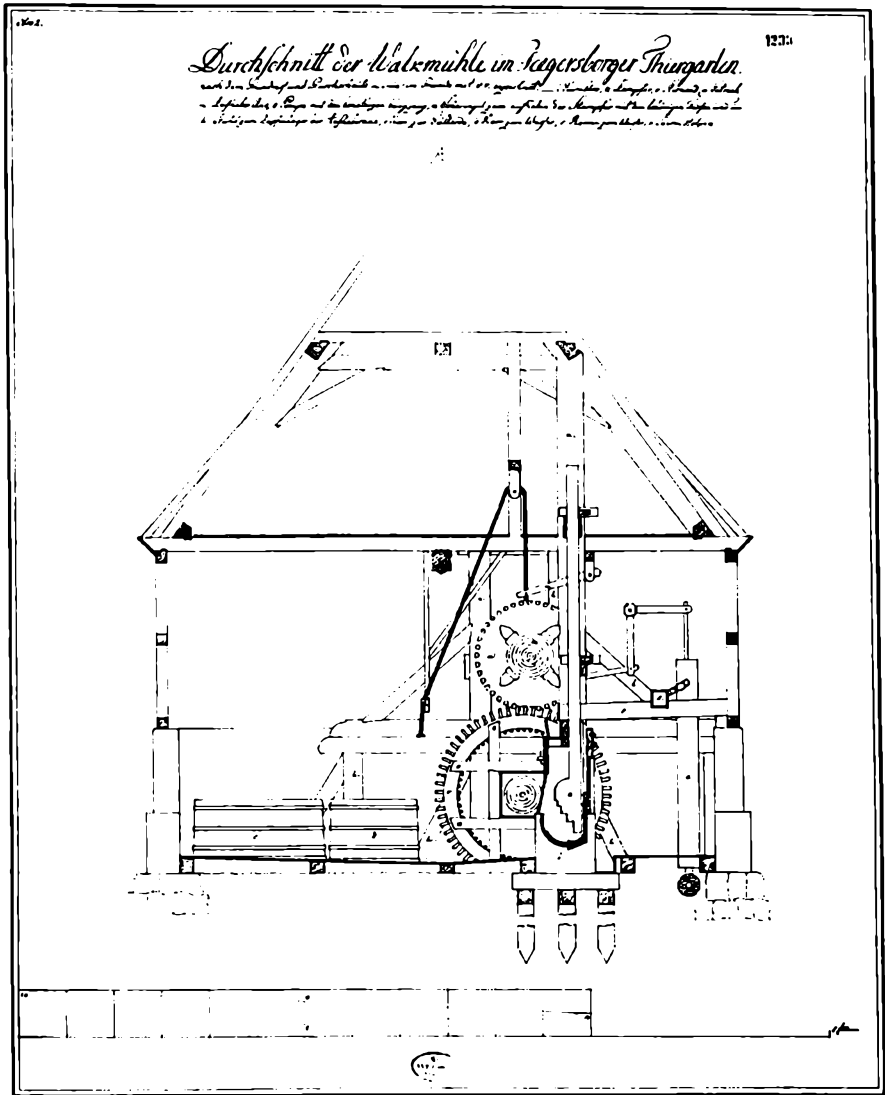


Fig. 40: Nationalmuseets Billedarkiv: Anno 1824: DK-568-Stampen, konstruktions-tegning: tværsnit, maal 1/100.

DK-568-Stampen, fulling mill on Mølleaaen, cross section, scale 1/100.

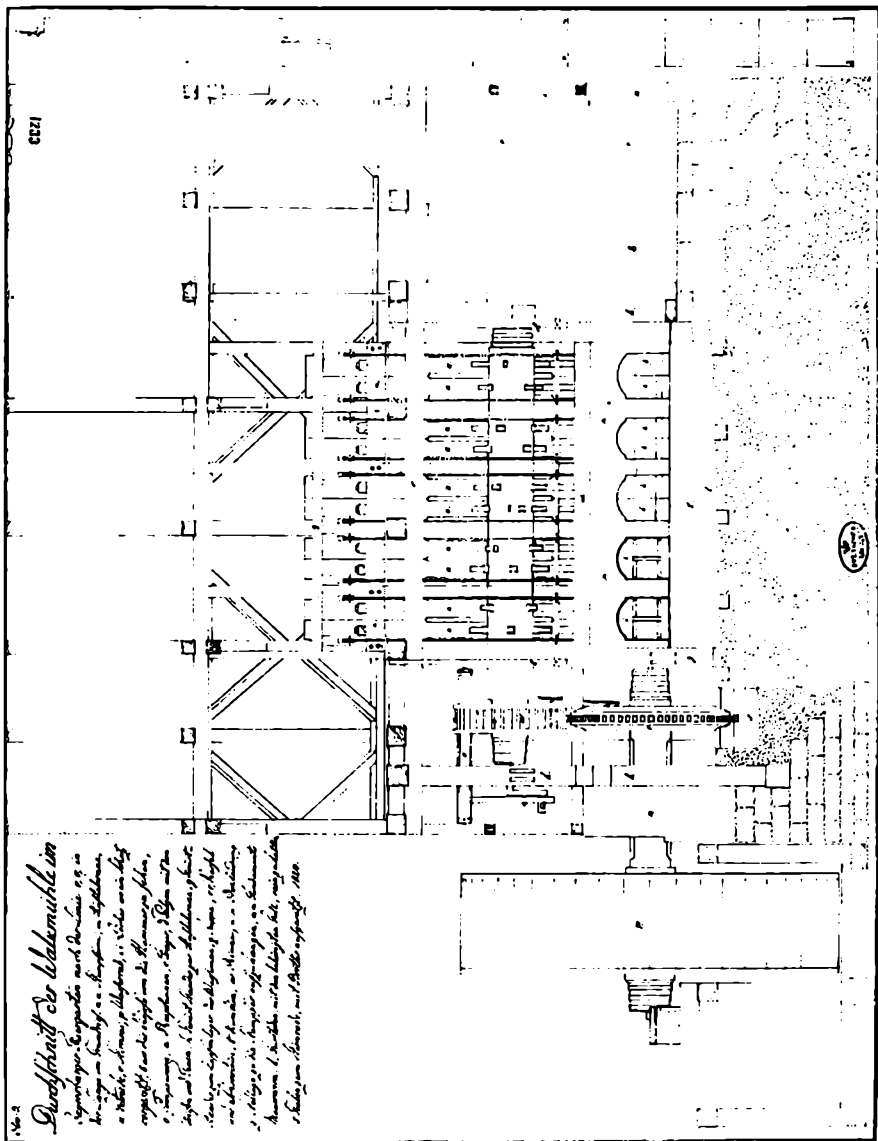


Fig. 41: Nationalmuseets Billedarkiv: Anno 1824: DK-568-Stampen, konstruksjons-tegning: længdesnit, maal 1/100.

DK-568-Stampen, fulling mill, construction drawing, longitudinal section 1/100.

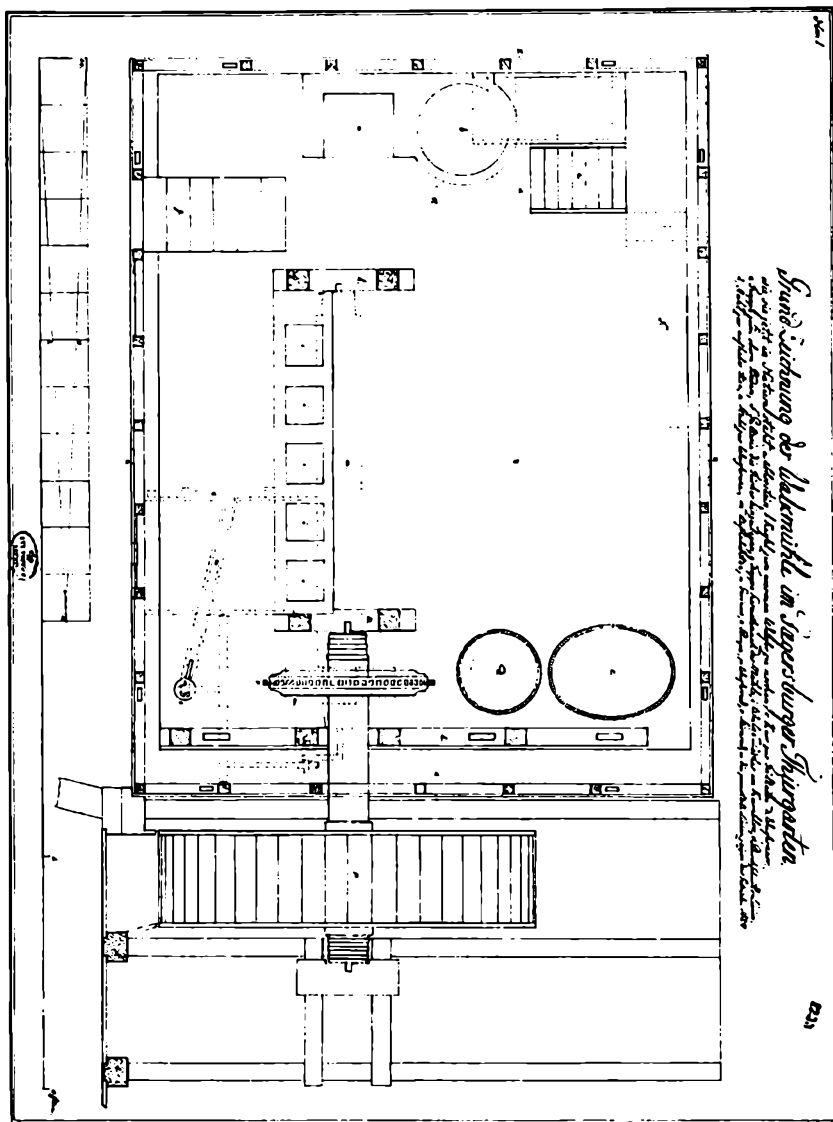


Fig. 42: Nationalmuseets Billedarkiv: Anno 1824: DK-568-Stampen, konstruktions-tegning: plan, maal 1/100.

DK-568-Stampen, fulling mill, construction drawing, plan, scale 1/100.

granted, and thence to extrapolate into the unknown. Above has been recorded the reconstruction of the external parts leaving only one point in doubt: the depth of the waterwheel shroud. Entering the mill we find the open room recorded in fig. 16. From fig. 22, 38, and 39 we know that a stone ledge was placed along the wall. The position of the shafts is known with a reasonable amount of accuracy from the measured sketches, and the 1864-addition to the stone ledge can be read from the photographs, and checked by the surviving timber blocks supporting the bearing timber. The position of the mill stones can now be decided. The pitch circle of the spurwheel was measured to be 166 cm diameter, and it is then possible to compute the stone nut pitch circle to:  $\frac{166 \times 25}{84} = 65$  cm diameter. The distance from centre of upright shaft to centre of mill stone will consequently be  $\frac{166 + 65}{2} = 115.5$  cm. This refers to stone nr. 1 placed in the middle of the mill. Stone nr. 2 placed nearer the outer wall towards the mill pond can be computed in the same way: centre distance: 118 cm. The mill stones delivered from Turup Mølle were 105 cm and 120 cm diameter, but the smaller one was worn out and the other had a composite stone. We therefore placed another set of 110 cm diameter blue stone in the small machine, and retained the composite stones in the larger one.

If the waterwheel turns at 1.9 m/second (see above) the stone speed may be computed thus:

$$\lambda_1 = \frac{1.9 \times 67 \times 64 \times 1.10}{3.3 \times 30 \times 25} = 3.62 \text{ m/second}$$

$$\lambda_2 \text{ is found in the same way to be: } 3.66 \text{ m/second}$$

According to Gearing in Watermills page 30 this corresponds to the average speed on mill stones on surviving one-step mills in Denmark, while the Funen two-step mills average 6.40 m/s. We may imagine that the millwright in 1864, when the mill must have been changed from one to two-step drive, has retained the stone speed unaltered, disregarding the possibility given him by the spurwheel to increase the speed of the mill, and thus the grinding capacity considerably: 4.4 times.

Should the Funen average have been followed, the spurwheel should have had  $\frac{64 \times 6.4}{3.62} = 113$  cogs, which is not at all unusual for a watermill.

As a point of interest it could be mentioned that DK-11-Brobyværk Mølle, which was rebuilt from one to two-step drive at about the same time, also received a slow gearing, resulting in a stone speed of 3.88 m/s, in this case from an under or breastshot wheel. Quite likely both mills were rebuilt by the same millwright. Brobyværk Mølle too has cogs in its wallower, the normal practice is sticks.

The bridgework and tenting mechanism was built in the traditional way by Millwright M. P. Petersen, Vester Aaby, Fyn, and the waterwheel and pentrough was also made by this craftman. The soft wood used in waterwheel/pentrough came from scrapped telephone poles from KTAS (Copenhagen Telephone Company Ltd.)

say 200 litres. Let the specific gravity for the wet oak wood be 1, the weight per stock will be c. 200 kg. The lift can be estimated at 0.3 m and the speed of the wyper shaft:  $\frac{1.9 \times 67}{3.3 \times \pi \times 31} =$  0.4 rev/s  
 There are 3 lifts per rev. or 0.4 x 3 = 1.2 lifts/s  
 on each stock. Working all six stocks, therefore, the plant will consume net:  
 $\frac{200 \times 0.3 \times 1.2}{75} =$  0.96 hp/stock  
 or for all 6 stocks ..... 5.76 hp

When the stock is suddenly brought from rest to speed, it will resist, and a part of the energy to overcome this inertia will be produced by the moving mass of the mill - thence the advantage of having the mill stone joined to the system. On the way most of the shocks will be absorbed by the elasticity of the system, but luckily most of this has been made with wood, having a rather high hysteresis loss, thus preventing undesirable resonance from appearing. This is prevented by internal deforming work in the wooden fibres, causing in turn dynamic losses. These losses must be added to the formidable losses due to friction between the stocks and the guide posts when the stock travels quickly up and down. On GB-37/418-Ruthven Works they had two identical beetling plants powered by a 35 hp and a 70 hp waterwheel respectively. The only difference between the two plants was that the one was geared c. 20 % higher than the other, and this necessitated a waterwheel twice as powerful (for use during spate).

We must at least consider 50 % of the energy supplied to the plant to be lost by friction and hysteresis, and each stock will therefore consume c. 2 hp.

With 6 hp available half the fulling mill can be operated, and the conclusion must be that if all stocks are to be operated simultaneously it is necessary to have 12 hp delivered by the waterwheel, while two tubs and 4 stocks may be worked by an 8 hp waterwheel, corresponding to a shroud depth of 26 cm instead of the present 20 cm.

These conditions will improve through time, as the wood dries out and as lubrication penetrates, but it still looks as if 6 stocks are fairly much for this small mill, and this is perhaps the explanation for the limited number of 4 stocks installed (re-installed) in 1864.

On the reconstruction of the fulling plant is yet to say that Mr. Dahlerup made a very fine piece of work on the stone ledge and the machinery, until he most unfortunately fell through a broken board in the attic and broke an arm on the stone ledge. This stage of work is represented by fig. 18.

Work on the fulling frame was then taken over by Børge Hillebrand, Contractor, of Møn. Mr. Hillebrand is originally educated as a wheelwright and is a most competent artisan. He cut out the fulling tub, and placed above it the necessary guide posts and bracings, and the fulling stocks. On April 1st 1965 the first two stocks could be tested, and on May 10th the mill was inaugurated. By this time the two mill stones had been erected by Millwright M. P. Petersen, and he also connected the washing machine to the spurwheel by means of a rope drive.

The oak wood for the fulling plant is new, and is the generous gift of Det Danske Trælastkompagni Ltd., Aarhus.

The washing machine was found in parts in the stores of Den Gamle By. It was repaired by the craftman of the Museum, Mr. Carl Jensen, Carpenter. Mr. Jensen also took care of the joinery jobs on the gallery, floors &c.

The washing or rinsing machine fitted very well in size, and function. It came out of N. Schmidts Dye Works, Thorsager, where no doubt it was hand operated, see fig. 29. The large flywheel had, however, perished, and in its place we put a grooved wheel for the rope drive, giving the machine a transport speed on the mangles of c. 1 m/second, corresponding to similar, though much larger machines in Huntingtowerfield Bleachworks in Perthshire, Scotland (ref/GB-37/416). The cloth is sewn in an endless tape passing through the mangles and falling into the tub below. This tub was also missing, but the original tub in the photograph looked very much like an old indigo box, and what was more natural for a dye works to use for the job than this? In the tub is either pure water or a solution of "fuller's earth", i. e. clay with a high content of lime. The lime will saponify the grease contained in the cloth, upon which the soap can be washed out. The erection of the washing machine in the scullery may be seen in fig. 26, 27 and 44.

The fulling tub has three separate sections, each of which may be drained out by removing a stopper in the bottom. The block into which the tub is cut is free on all sides to prevent decay, but a loose plank bridge is placed between the edge of the basement floor and the edge of the tub. This has been constructed on an ordinary works analytical speculation. Similarly goes for the old blue stone, which has been placed in the basement floor at the foot of the stair case. This is where the fullers hand will place his foot when he comes with his buckets full of scolding soap water. His clogs will be less apt to slide on the rough surface of the mill stone than on the smooth surfaced cobbles.

The fulling mill is now completed and is workable. At the inauguration a piece of cloth was being fullled, but the process could not be terminated within the hour



Erecting the stone ledge from the old timber from Kilde Mølle was done by Millwright, Engineer Dahlerup, Allerød, Sjælland.

It should be mentioned that the upright shaft was not available from the beginning. We had expected to use the one from Turup Mølle, it could be shortened down to suit the job. A renewed check through the stores of Den Gamle By, however, exposed a shaft fitting in length exactly the mill now under erection. The strange thing was that the surplus 17 cm had now mysteriously vanished. The upright shaft could just squeeze in between the waterwheel shaft, and the beam above the stone ledge. Unfortunately this particular beam had been renewed, and the fragments of the old one had been disposed of, so we have no positive knowledge as to the exact shape of the top bearing. However, the top journal has now been supported in a "lock" bearing, and the two stone nuts each in their own removable bearing beam, all as shown in Engqvist's sketch. This sketch also showed two holes in the floor boarding, and below these holes must have been placed the two hoppers for the mill stones.

---

Now one corner of the mill has been "furnished", and we may step into the partly unknown: the fulling plant.

The position of the wipers corresponds well with the dimensions quoted by Mr. Hansen for the width of the fulling stocks - if we reckon the width of a "guide-board" to be 12 cm between each fulling group each comprising two stocks. In reconstructing the fulling plant much help was gathered from the outside:

re 12) A set of construction drawings for DK-568-Stampen on Mølleaaen (the Mill River) near Copenhagen. The drawings are on file in Nationalmuseets Billedarkiv, København. This material has been included as fig. 40, 41, and 42 in the same scale, 1/100, as the drawings of Svanninge Stampemølle for ease of comparison.

re 13) S-32-Bodarsjön Stampa, now placed in the open air museum Skansen in Stockholm, Sweden, see fig. 30 and 34.

The pile foundation below the fulling trough in DK-568 made us take this problem of foundation seriously: a heavy concrete block was cast below the fulling tub, partly as a foundation, and partly as a mass resistance to meet the considerable forces released when the stocks fall into the tub. It would of course have been possible to investigate this matter further in Svanninge, if the owner had not built himself a house on the foundations of the old Stampemølle.

When the position of the wyper shaft is known, and the size of the fulling tub too, it is possible to draw up the structure with reference to known plants elsewhere. The floor level comes automatically, and similarly goes for the fastening of the guide boards to the hurst.

Based on a renewed study of the Bodarsjön Stampe in August 1964 it became clear, however, that an 8 cm thick stock could do no proper work. It had to be thickened at the bottom, we called this "stock-hoof", and to give extra weight and particularly to allow of a securely fastening of the lifting cogs we extended the hoofs c. 1.3 m from the bottom of the stock. Another important thing found at Bodarsjön was the oblique form of the stepped back feet of the stocks. It is obviously the intention to submit the cloth to a stress, thus preventing it from curling up in the tub during the process of fulling. Curling would no doubt ruin the cloth. Another detail from Bodarsjön was the so called "boot-jack": plates of soft poplar wood placed along the back of the stocks to prevent wearing the side wood of the fulling tub by peeling the fibres off one by one.

In this way we created a machine which could function, but which may be a little on the outside of what the mill can pull. We must bear in mind, however, that as little as a miller will work all his grinding stones at any one time, as little does he necessarily work all his stocks simultaneously. Each stock can be thrown off load by catching it with an iron rod in a hole when the stock arrives at its highest position. By turning the lever down a little, the stock is lifted free from the wyper entirely, and now another hole becomes visible into which an iron blocking pin can be inserted. This was another detail collected at Bodarsjön. On the idle stock the lifting cog is now out of reach of the wyper.

During the test run, when the wood was still wet and not sufficiently lubricated throughout, and when the waterwheel was suspended in backwater, and the headwater in the pentrough was not at flood gauge level we could not run more than two stocks at a time. If we engaged four the mill might stall, and with two only it was apt to run away. But when the mill stone was added as a "pure ohm resistance" the mill was working very well. Perhaps this is some of the explanation for the placing of the mill stones in a fulling mill: they smoothen out the working of the plant, dynamically as well as economically. The latter is also obvious from the fire insurance valuations.

The effect consumption of the fulling stock can only be guessed at, since the losses are unknown:

|                                               |                  |
|-----------------------------------------------|------------------|
| The stock has a volume of approximately ..... | 109 litres       |
| the hoof c. ....                              | <u>89 litres</u> |
| total .....                                   | 198 litres       |

or so it took to empty the mill pond. A period of adjustment lies ahead, where also the smaller things still missing may be added, the lintel on top of the fulling frame, e. g. is in the process of completion at time of writing. It is also being made by Mr. Hillebrand.

The most important things still missing are a better water supply of c. 200 l/s, and a better connection from tail-race to the Møllerup pond.

When these problems are solved, the Stampemølle will be able to work continuously, and the last adjustments may be made.

It will be very useful to have this mill used occasionally for fulling, but the mill may also be used for grinding corn, and the same water will then be available at Møllerup Mølle. From the Tanner's pond below Møllerup Mølle water may then be returned by pumping to a place above Stampemøllen, a total lift to 13.00 m O.D. — 6.00 m O.D. = 7.00 m. If we envisage a 200 m P. V. C. tube of 300 mm diameter, the transport loss will amount to c. 27 m/km or c. 5.4 m for the 200 m conduit. The pump must in consequent be able to deliver 200 l/s against a head of 12.4 m.

When this system operates Møllerup Mølle will have c.

$$\frac{200 \times 1.3 \times 0.3}{75} = 1.04 \text{ hp (metric)}$$

$$\text{by which may be ground (barley)} \frac{1040}{22} = 48 \text{ kg/h}$$

The present waterwheel at Svanninge Stampemølle will - provided the wheel be overloaded and consequently work to a smaller rate of efficiency, say 0.7 - be able to develop:

$$\frac{200 \times 4.08 \times 0.7}{75} = 7.6 \text{ hp}$$

$$\text{by which may be ground (barley)} \frac{7600}{22} = 345 \text{ kg/h}$$

The considerable difference between the grinding capacities of these two mills is partly to be found in the greater head at Stampemøllen, and partly in the much better efficiency of the overshot wheel as compared with the undershot wheel.

$$\text{To pump up water will be necessary: } \frac{200 \times 12.4 \times 2}{75} = 66 \text{ hp}$$

equivalent to an electricity consumption (including losses in the electric motor) of 48.5 kW

With an electricity price of 12 øre/kWh the current expenses will be c.:

$$(\text{= c. 6 shillings/hour}) \quad 6 \text{ kr/hour}$$

The stream passing these two mills is just a small burn, being as unfortunate as

a mill stream can be: it only receives surface water from the park and from the Ring Road. This means that during the summer it is almost dry, but during a storm anything like 2 m<sup>3</sup> per second may arrive, quite enough to submerge the lower floor of Stampemøllen and enough too to deposit large amounts of silt.

The cut through to Møllerup from the tail-race of Stampemøllen will remove this problem, and even if the back-pumping of water will not create more water in the system, it will certainly purify the little water which is already there, by oxydation as the water passes two open waterwheels. During long periods of drought perhaps 10 % mains water could be added to the pump water.



It remains to thank the Executives of Den Gamle By for the trust they have shown me by placing the conclusion of this interesting problem in my hands, and to acknowledge the excellent work in re-erecting the house. Further I must thank the craftsmen and Mr. Brahe-Christensen, Director, who secured Svanninge Stampemølle for Den Gamle By, and who has since been very active in connection with the rebuilding of the mill. A sincere vote of thanks to the Borough Gardener of Aarhus who accepted the present location of the mill, bringing the topographical conditions as near as possible to those of Svanninge. The mill could certainly not have found a better place within the Museum area. The expenses in connection with moving and rebuilding the fulling mill were met mainly by Textilfabrikantforeningen (Textile Manufacturers Association), by Aarhus Town Council, Aarhus Oliefabrik (Aarhus Oil), Andelsklædefabriken Grindsted, and Korn- & Foderstofkompaniet.

Anders Jørgensen.

07-05-66

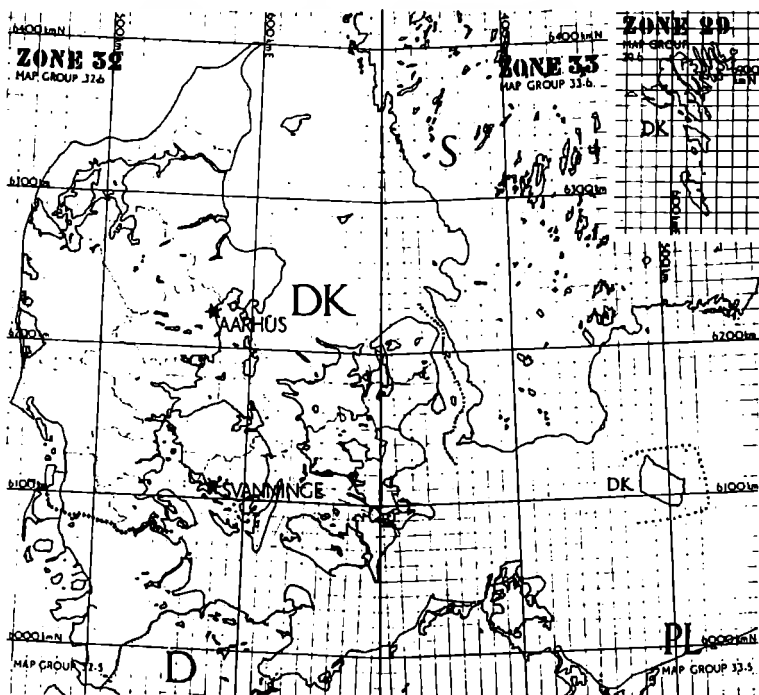
# TOPOGRAPHICAL INDEX

Topographical names and places, mentioned in this book, are quoted below in Universal Transverse Mercator Grid or (where specifically mentioned) in the National Grid, covering Great Britain. Where no digit is available or where it is unnecessary due to the extent of the place °°° are inserted in place of the digits.

| Name of place                                         | UTMn | Zone | East<br>km | North<br>km |
|-------------------------------------------------------|------|------|------------|-------------|
| Aarhus .....                                          |      | 32   | 575.°°°    | 6224.°°°    |
| Allerød .....                                         |      | 33   | 334.°°°    | 6194.°°°    |
| Allévejen (Gamle By, Aarhus) .....                    |      | 32   | 574.061    | 6224.707    |
| Bodarsjön Stampa-S-32 (original location) .....       |      | 33   | 45.°°°     | 685.°°°     |
| Brobyværk Mølle-DK-11 .....                           |      | 32   | 580.210    | 6121.450    |
| Copenhagen (see København)                            |      |      |            |             |
| Faaborg .....                                         |      | 32   | 579.°°°    | 6106.°°°    |
| Fyn .....                                             |      | 32   | 58.°°°     | 613.°°°     |
| Gamle By, Købstadsmuseum/ Borough Museum .            |      | 32   | 574.°°°    | 6224.°°°    |
| Grindsted .....                                       |      | 32   | 496.°°°    | 6179.°°°    |
| Grubbe Mølle-DK-119 .....                             |      | 32   | 577.360    | 6109.030    |
| Holte (Author's H. Q.) .....                          |      | 33   | 340.320    | 6188.010    |
| Hornemøllebæk .....                                   |      | 32   | 577.°°°    | 6109.°°°    |
| Huntingtowerfield Bleachfield-GB-37/416 National Grid |      |      | 307.200    | 725.750     |
| Jylland (~Jutland) .....                              |      | 32   | 5.°°°      | 62.°°°      |
| Kaleko Mølle-DK-76 .....                              |      | 32   | 580.930    | 6106.780    |
| Kilde Mølle-DK-53 .....                               |      | 32   | 603.520    | 6130.010    |
| København .....                                       |      | 33   | 34.°°°     | 617.°°°     |
| Landsarkivet for Fyn (Odense) .....                   |      | 32   | 587.690    | 6140.360    |
| Mølleaaen (~Fuuraa ~Fuurstrømmen) .....               |      | 33   | 343.°°°    | 6185.°°°    |
| Møllerup Mølle-DK-1386 (original location) .....      |      | 32   | 596.598    | 6238.935    |
| Møllerup Mølle, present location in Aarhus .....      |      | 32   | 574.113    | 6224.618    |
| Møn .....                                             |      | 33   | 32.°°°     | 609.°°°     |
| Nationalmuseet (Prinsens Palais, København) ...       |      | 33   | 347.630    | 6172.800    |
| Pjedsted .....                                        |      | 32   | 540.°°°    | 6162.°°°    |
| Ravnholt Gods .....                                   |      | 32   | 600.°°°    | 6125.°°°    |
| Ringkøbing .....                                      |      | 32   | 453.°°°    | 6216.°°°    |
| Ringvejen (Aarhus) .....                              |      | 32   | 573.°°°    | 6225.°°°    |
| Ruthven Beetling Mill-GB-37/418 .....                 |      |      | 308.130    | 725.239     |
| Salling Herred .....                                  |      | 32   | 58.°°°     | 611.°°°     |
| Skansen (Open Air Museum, Stockholm) .....            |      | 34   | 33.°°°     | 657.°°°     |
| Stampen-DK-568 .....                                  |      | 33   | 346.560    | 6187.560    |
| Steensgaard .....                                     |      | 32   | 575.460    | 6111.310    |
| Svanninge By & Sogn .....                             |      | 32   | 578.°°°    | 6109.°°°    |
| Svanninge Stampemølle-DK-63 (original location) .     |      | 32   | 578.640    | 6109.180    |
| Svanninge Stampemølle, present location, Aarhus .     |      | 32   | 574.055    | 6224.732    |
| Thorsager (~Torsager) .....                           |      | 32   | 590.°°°    | 6245.°°°    |
| Turup Mølle-DK-35 .....                               |      | 32   | 561.865    | 6129.625    |
| Vester Aaby (Fyn) .....                               |      | 32   | 587.°°°    | 6105.°°°    |

An outline map of Denmark to scale 1/5 000 000 is found in the next page. The UTM-grid has been superimposed.

# UNIVERSAL TRANSVERSE MERCATOR GRID



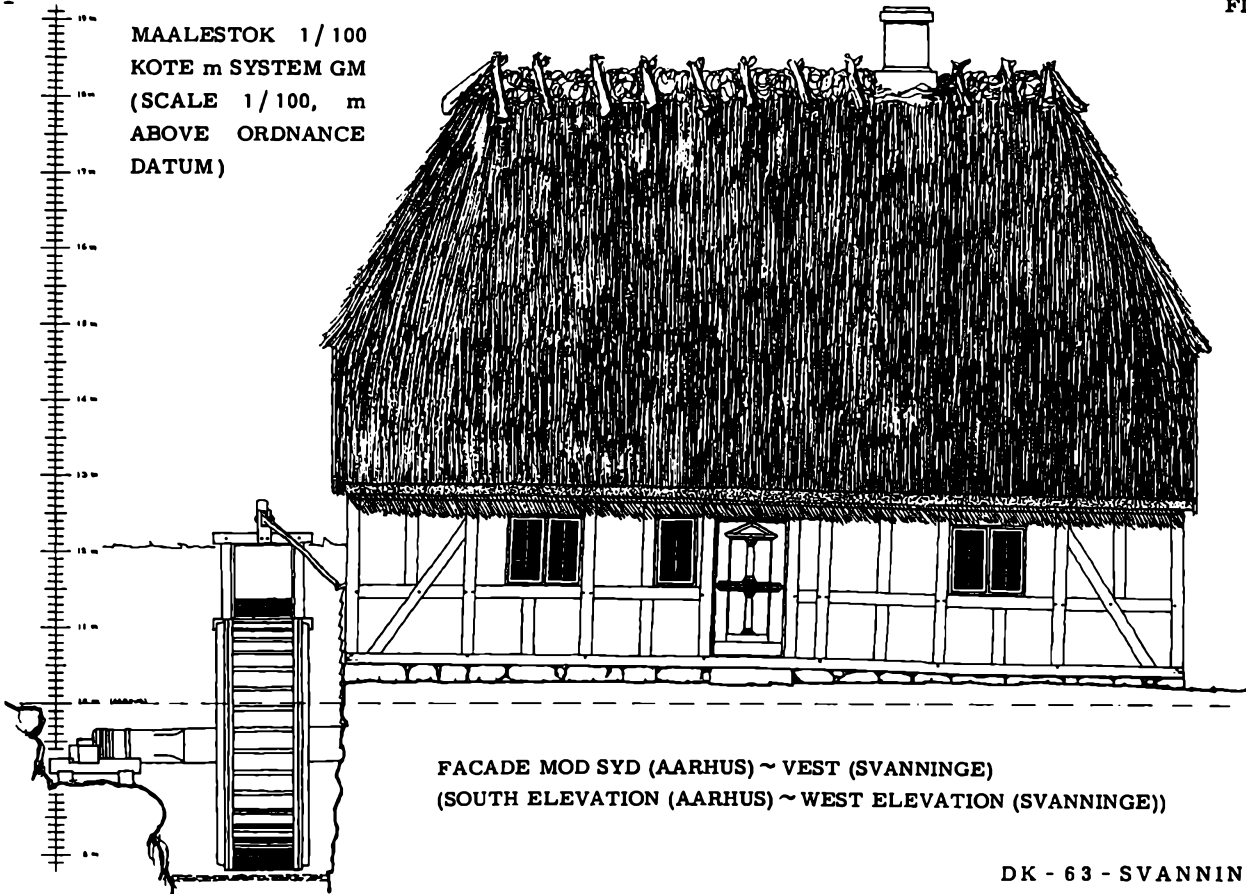
DANMARK

scale 1/5 000 000

Where nothing else has been acknowledged photographs have been taken by the author. The negative numbers will make it possible to trace any neighbouring photographs in the files.

- 204 Jespersen, Anders: Gearing in Watermills/Gangtøjet i Vandmøller. Virum ..... 1953
- 212 Jespersen, Anders: Report on Watermills, Vol. 3 (later also Vol. 5): Scale Drawings. Virum ..... 1957
- 220 Skansens Hus och Gårder. Stockholm ..... 1953
- 226 Hansen, Mette: Svanninge Stampemølle ..... 1954
- 230 Christensen, Brahe: Genfremstillingen af en Gammel Textilvirksomhed Tidsskrift for Textilindustrien, april ..... 1955
- 323 Jespersen, Anders: Standard Proposals for Mill Survey Work. Nationalmuseets Mølleudvalg / Danske Møllers Venner... 1965
- 324 Jespersen, Anders: Mill Preservation in Denmark. Nationalmuseets Mølleudvalg/ Danske Møllers Venner .....1965

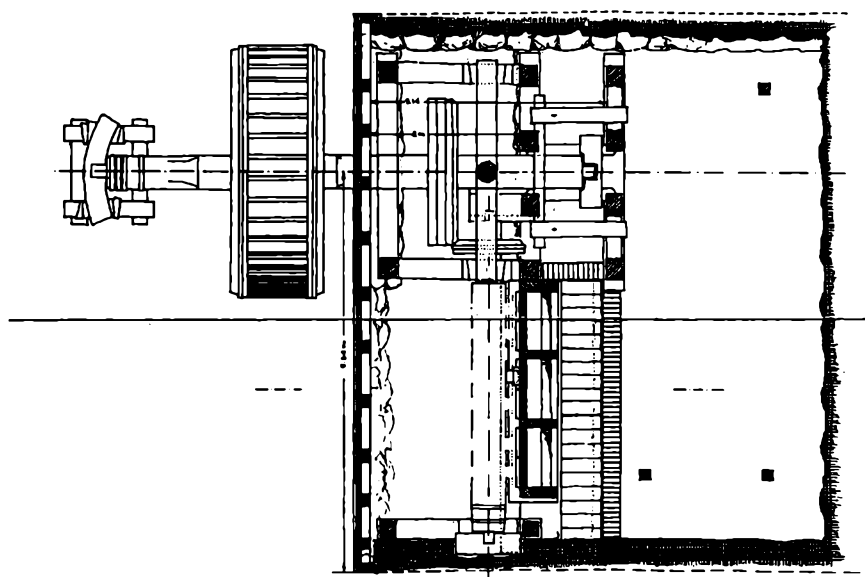
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 (SCALE 1/100, m  
 ABOVE ORDNANCE  
 DATUM)



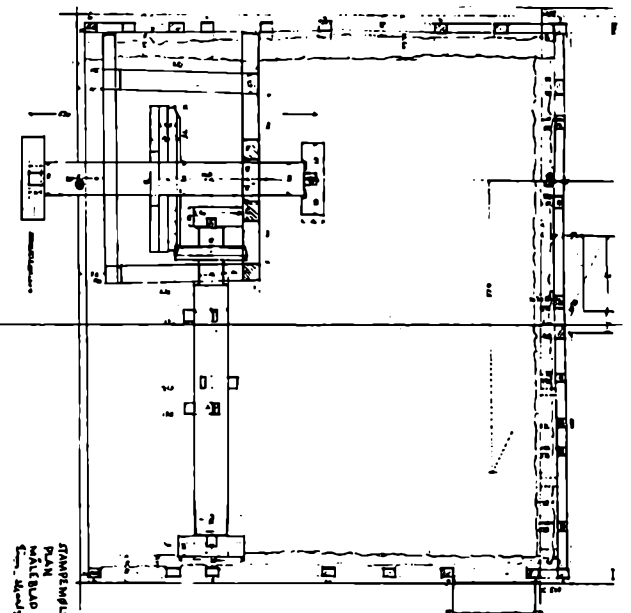
FACADE MOD SYD (AARHUS) ~ VEST (SVANNINGE)  
 (SOUTH ELEVATION (AARHUS) ~ WEST ELEVATION (SVANNINGE))

(ANDERS JESPERSEN)

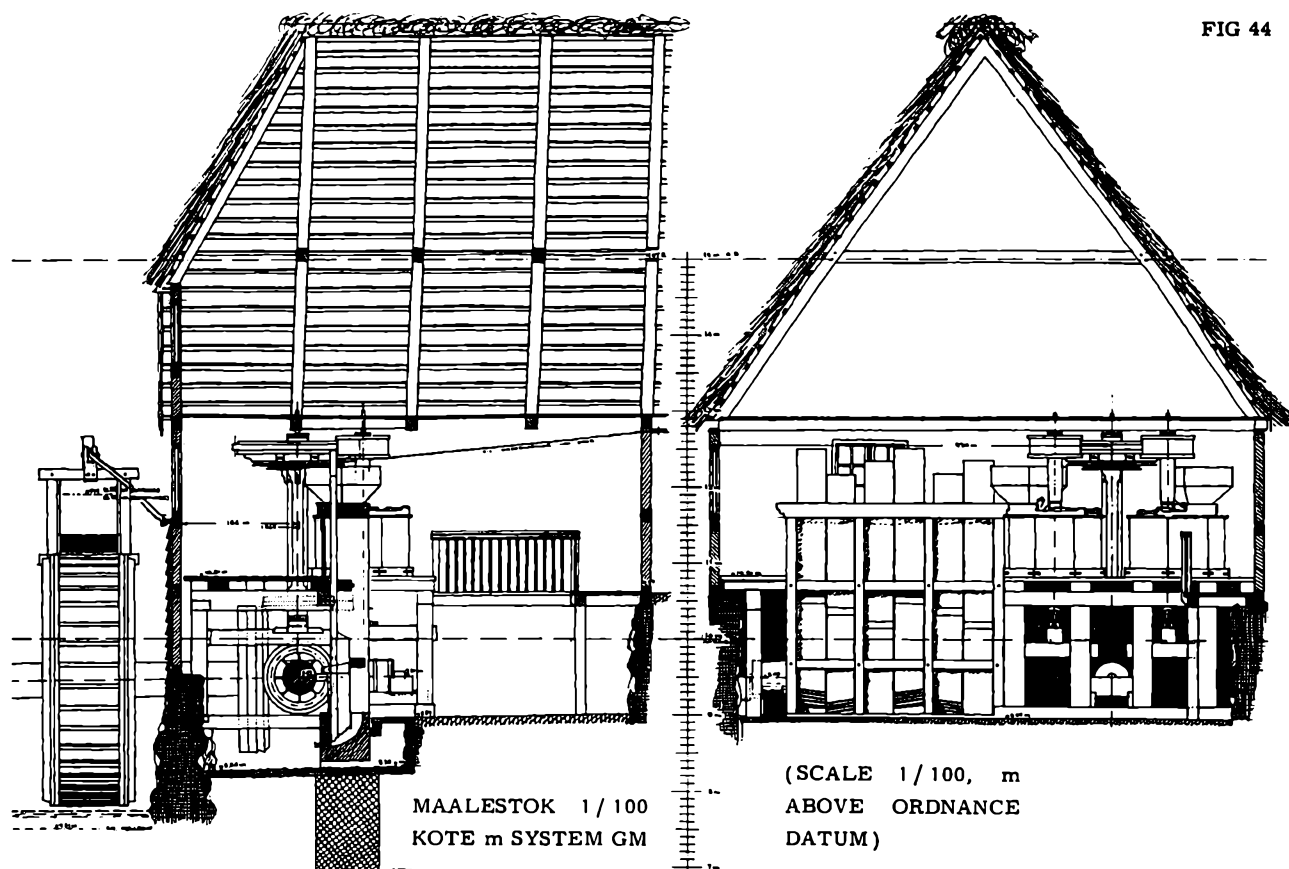
DK - 63 - SVANNINGE STAMPEML.  
 MATR.NR. 76 SVANNINGE BY & SOGN,  
 SALLING HERRED, SVENDBORG AMT.  
 MB 40 15. UTMn/32/578.640/6109.180.  
 HORNEMØLLEBÆK ~ HORNE KROG/  
 LILLE BÆLT.  
 EFTER GENOPSTILLING I KØBSTADSMU-  
 SEET DEN GAMLE BY, AARHUS:  
 MB 22 17. UTMn/32/574.055/6224.732.  
 BÆK ~ AARHUS BUGT/KATTEGAT.  
 GENOPSTILLINGSTEGNING.



PLAN AF UNDERMØLLE  
 (PLAN OF BASEMENT)



OPMAALINGSSKITSE AF FINN HJARTGÅRD



SNIT ≠ VANDHJULSAXEL FRA SYD (AARHUS)

(SECTION ≠ WATERWHEEL SHAFT FROM SOUTH (AARHUS))

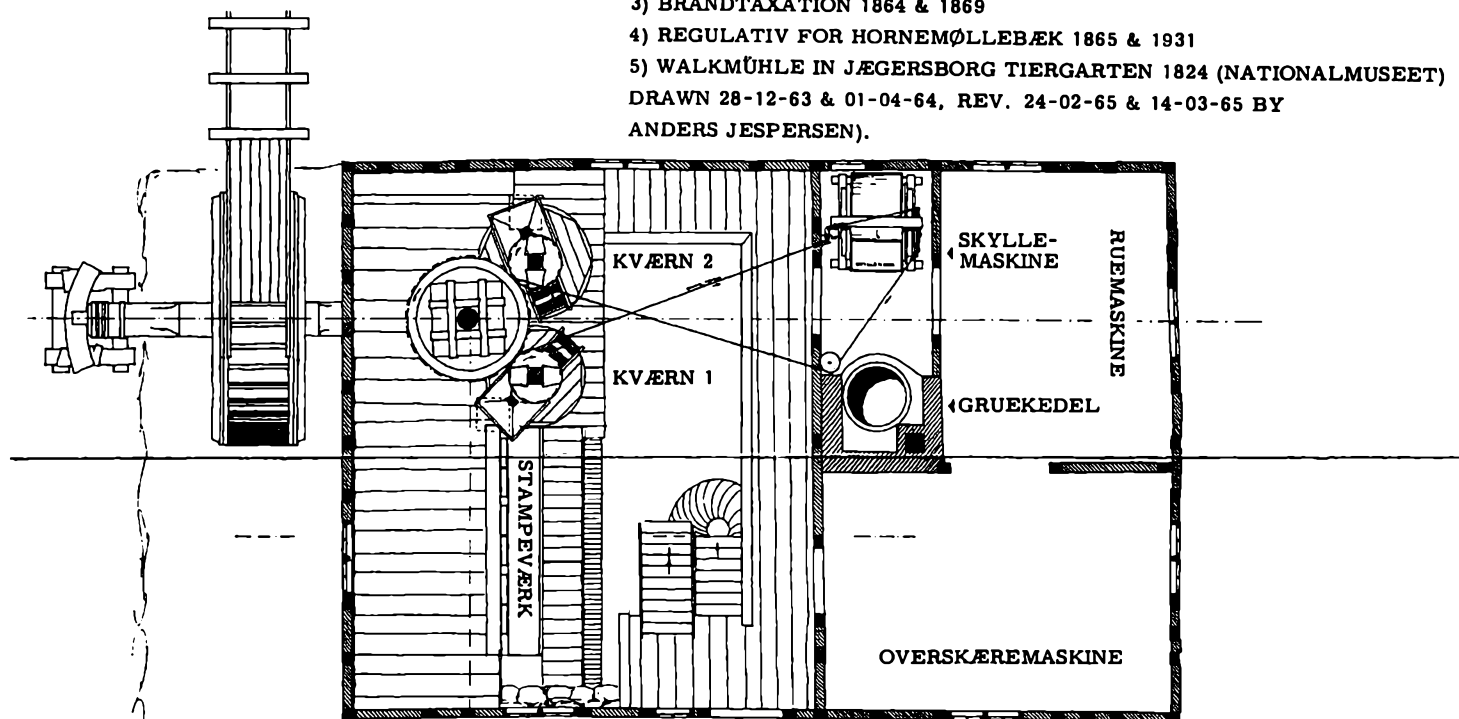
SNIT ⊥ VANDHJULSAXEL FRA ØST (AARHUS)

(SECTION ⊥ WATERWHEEL SHAFT FROM EAST)

DK - 63 - SVANNINGE STAMPEML.  
 MATR.NR. 76 SVANNINGE BY & SOGN,  
 SALLING HERRED., SVENDBORG AMT.  
 MB 40 15. UTMn/32/578.640/6109.180.  
 HORNEMØLLEBÆK → HORNE KROG/  
 LILLE BÆLT.

(CONSTRUCTION DRAWING OF FULLING STOCK ETC.  
 BASED ON:

- 1) CONSTRUCTION DRAWINGS BY H.H. ENGQVIST, M.A.A. REV.05-01-60
- 2) LEVEL CONTROL ON RE-ERECTED HOUSE 1964
- 3) BRANDTAXATION 1864 & 1869
- 4) REGULATIV FOR HORNEMØLLEBÆK 1865 & 1931
- 5) WALKMÜHLE IN JÆGERSBORG TIERGARTEN 1824 (NATIONALMUSEET)  
 DRAWN 28-12-63 & 01-04-64, REV. 24-02-65 & 14-03-65 BY  
 ANDERS JESPERSEN).



PLAN AF KVÆRNLOFT  
 (PLAN OF STONE FLOOR)

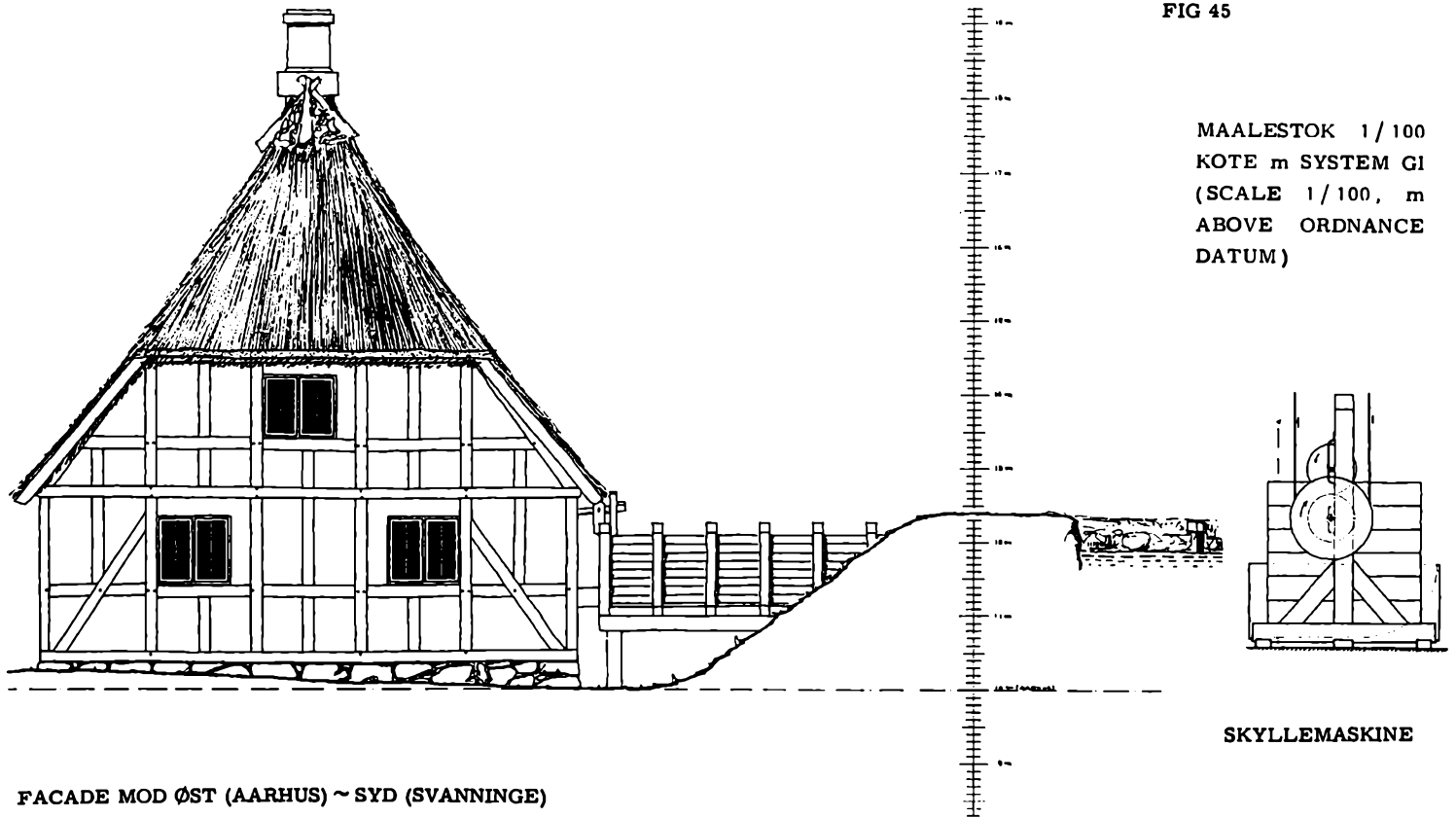
KONSTRUKTIONSTEGNING AF STAMPEVÆRK M. V.  
 BASERET PAA:

EFTER GENOPSTILLING I KØBSTADSMU-  
 SEET DEN GAMLE BY, AARHUS:  
 MB 22 17. UTMn/32/574.055/6224.732.  
 BÆK → AARHUS BUGT/KATTEGAT.  
 GENOPSTILLINGSTEGNING.

- 1) ARKITEKT ENGQVISTS OPSTILLINGSTEGNING REV.05-01-60
- 2) KONTROLNIVELLELEMENT AF OPSTILLEDE HUS 1964
- 3) BRANDTAXATION 1864 & 1869
- 4) REGULATIV FOR HORNEMØLLEBÆK 1865 & 1931
- 5) WALKMÜHLE IN JÆGERSBORG TIERGARTEN 1824 (NATIONALMUSEET)  
 SAMMENTEGNET 28-12-63 & 01-04-64, REV. 24-02-65 & 14-03-65 AF  
 ANDERS JESPERSEN.



FIG 45



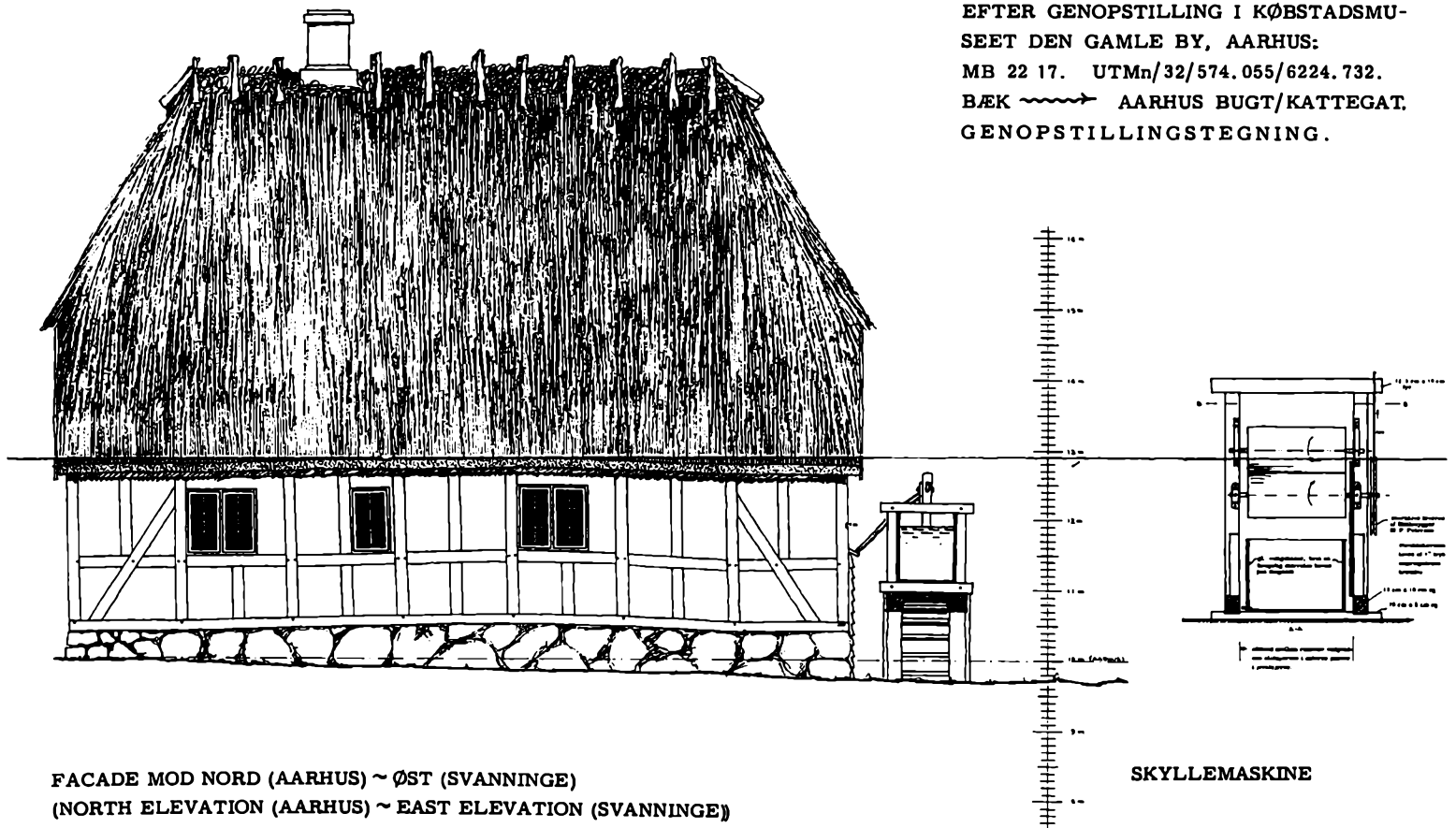
MAALESTOK 1/100  
 KOTE m SYSTEM G1  
 (SCALE 1/100, m  
 ABOVE ORDNANCE  
 DATUM)

SKYLLEMASKINE

FACADE MOD ØST (AARHUS) ~ SYD (SVANNINGE)  
 (EAST ELEVATION (AARHUS) ~ SOUTH ELEVATION (SVANNINGE))

(ANDERS JESPERSEN)

DK - 63 - SVANNINGE STAMPEML.  
 MATR.NR. 76 SVANNINGE BY & SOGN,  
 SALLING HERRED, SVENDBORG AMT.  
 MB 40 15. UTMn/32/578.640/6109.180.  
 HORNEMØLLEBÆK ~ HORNE KROG/  
 LILLE BÆLT.  
 EFTER GENOPSTILLING I KØBSTADSMU-  
 SEET DEN GAMLE BY, AARHUS:  
 MB 22 17. UTMn/32/574.055/6224.732.  
 BÆK ~ AARHUS BUGT/KATTEGAT.  
 GENOPSTILLINGSTEGNING.



SKYLLEMASKINE

FACADE MOD NORD (AARHUS) ~ ØST (SVANNINGE)  
 (NORTH ELEVATION (AARHUS) ~ EAST ELEVATION (SVANNINGE))

CONSTRUCTION DRAWING OF PENTROUGH & WATERWHEEL  
 BASERET PAA:

- 1) ARKITEKT ENGQVISTS OPSTILLINGSTEGNING
- 2) KONTROLNIVELLELEMENT AF OPSTILLEDE HUS 1964
- 3) BRANDTAXATION 1864 & 1869
- 4) REGULATIV FOR HORNEMØLLEBÆK 1865 & 1931

(CONSTRUCTION DRAWING OF PENTROUGH & WATERWHEEL  
 BASED ON:

- 1) CONSTRUCTION DRAWING BY H. H. ENGQVIST, M. A. A.
- 2) LEVEL CONTROL ON RE-ERECTED HOUSE 1964
- 3) FIRE INSURANCE VALUATION 1864 & 1869
- 4) WATERWAYS REGULATION FOR HORNEMØLLEBÆK 1865 & 1931

SAMMENTEGNING 30-03-64 AF ANDERS JESPERSEN  
 (DRAWN 30-03-64 BY ANDERS JESPERSEN)

FACADE MOD VEST (AARHUS) ~ NORD (SVANNINGE)  
 (WEST ELEVATION (AARHUS) ~ NORTH ELEVATION  
 (SVANNINGE))

HERUNDER: BELIGGENHEDSPAN I 1/500  
 (BELOW: SITE PLAN 1/500)

DK-63-SVANNINGE

FIG 46

STAMPEML.

MAALESTOK 1/100  
 KOTE m SYSTEM GM  
 (SCALE 1/100, m  
 ABOVE ORDNANCE  
 DATUM)

