

Fig. 1.

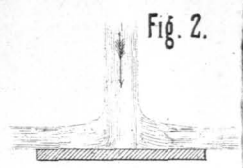


Fig. 2.

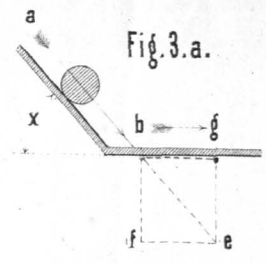


Fig. 3.a.

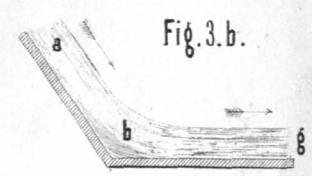


Fig. 3.b.

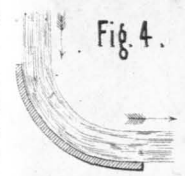


Fig. 4.

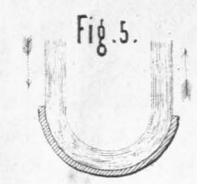


Fig. 5.



Fig. 6.

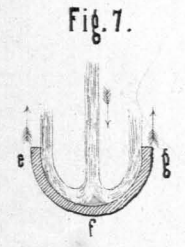


Fig. 7.

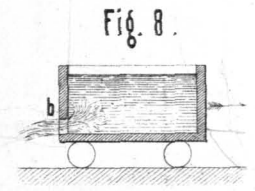


Fig. 8.

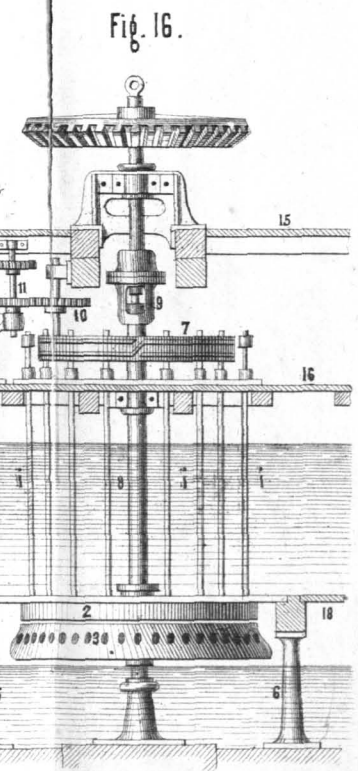


Fig. 16.

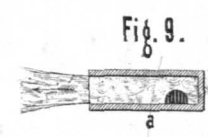


Fig. 9.

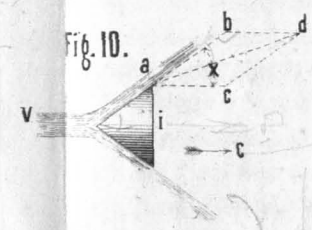


Fig. 10.

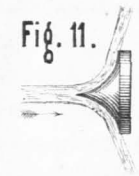


Fig. 11.

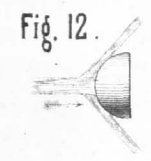


Fig. 12.

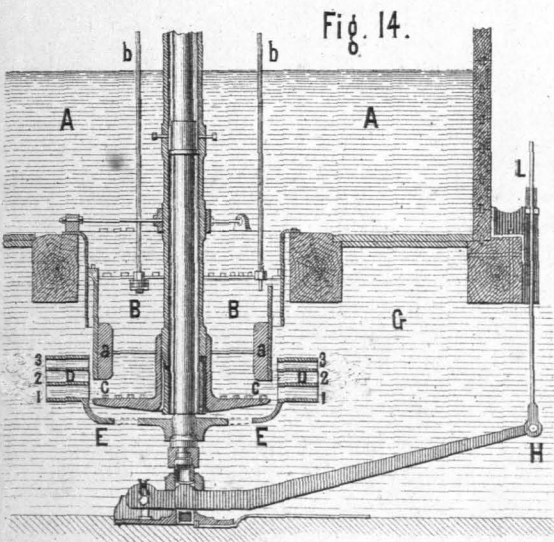


Fig. 14.

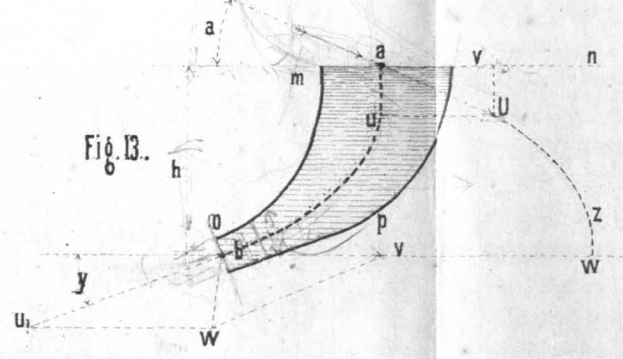


Fig. 13.

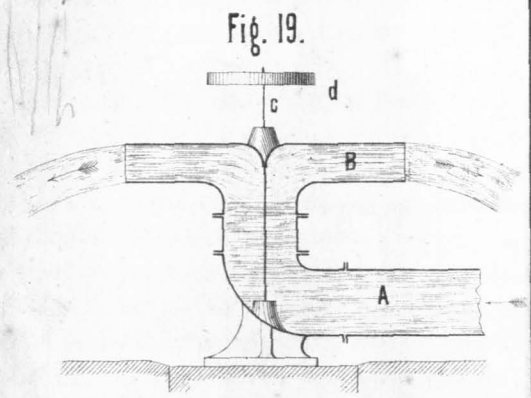


Fig. 19.

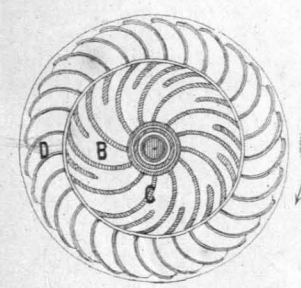


Fig. 15.

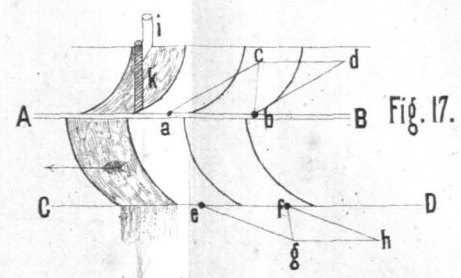


Fig. 17.

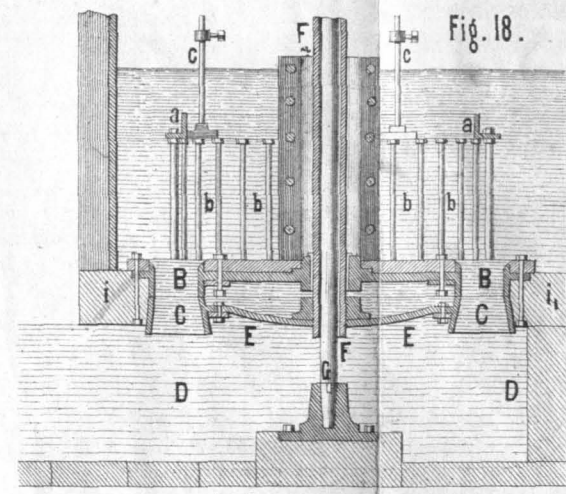


Fig. 18.

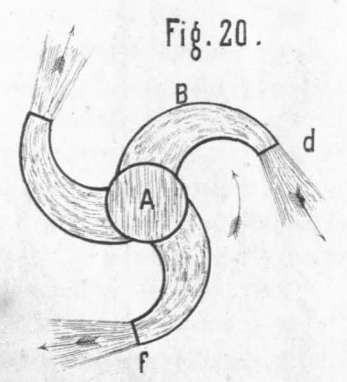


Fig. 20.

Fig. 1.

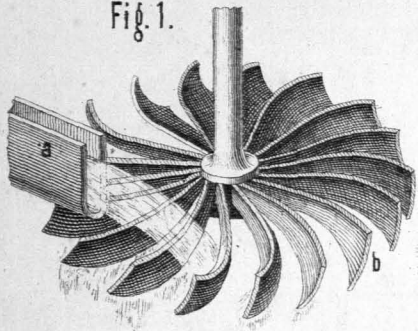


Fig. 2.

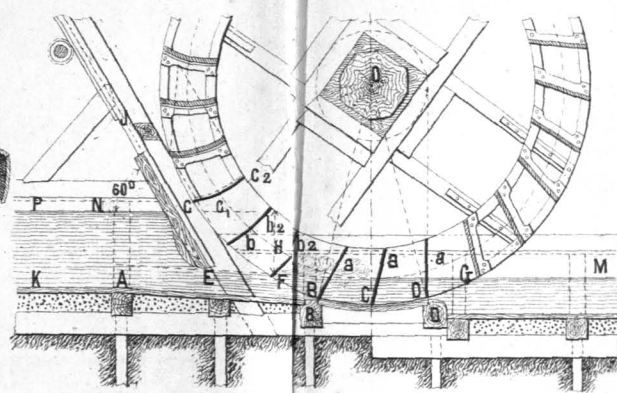


Fig. 3.

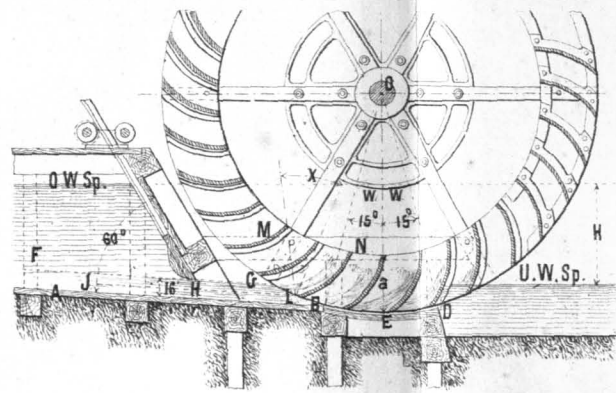


Fig. 5.

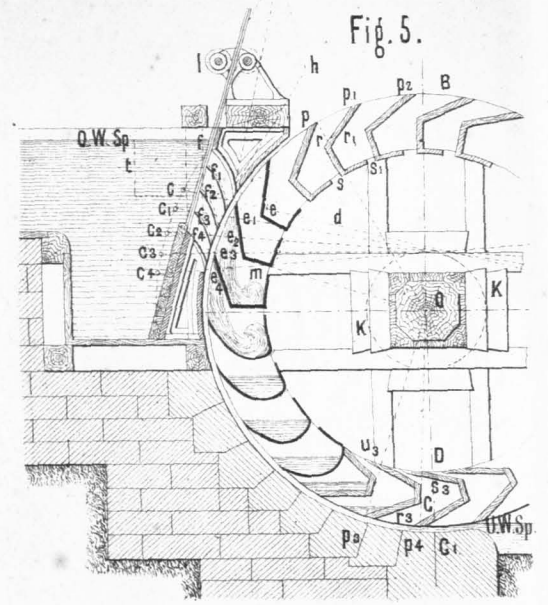


Fig. 4.

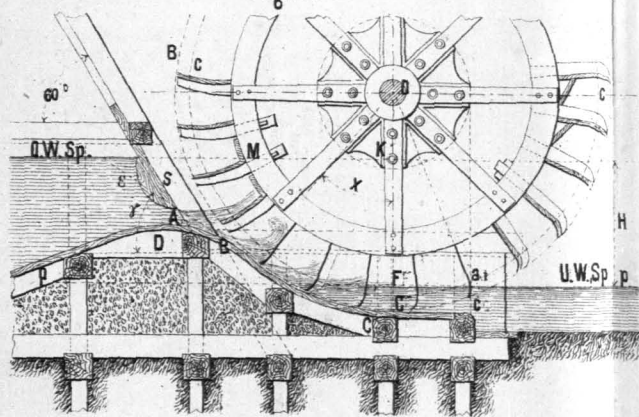


Fig. 6.

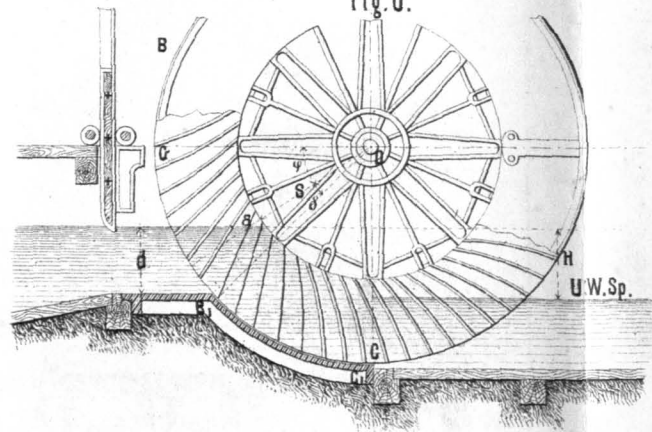


Fig. 8.

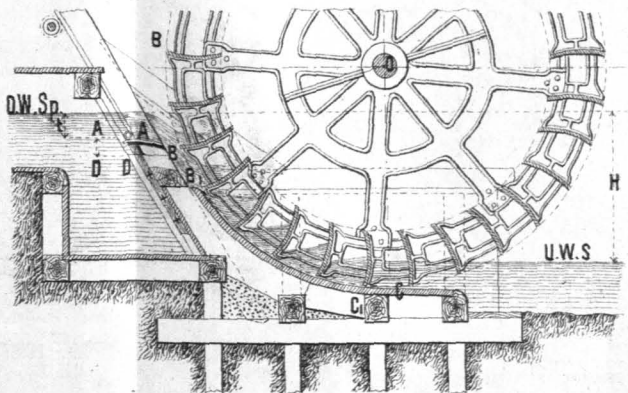


Fig. 9.

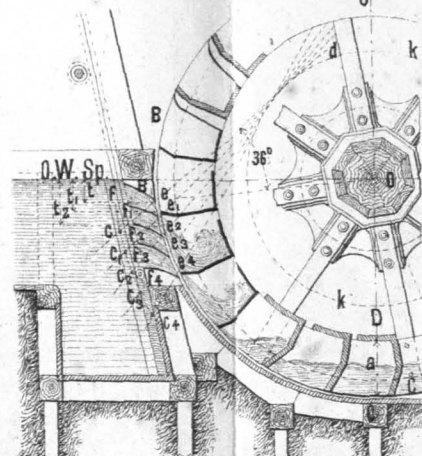


Fig. 10.

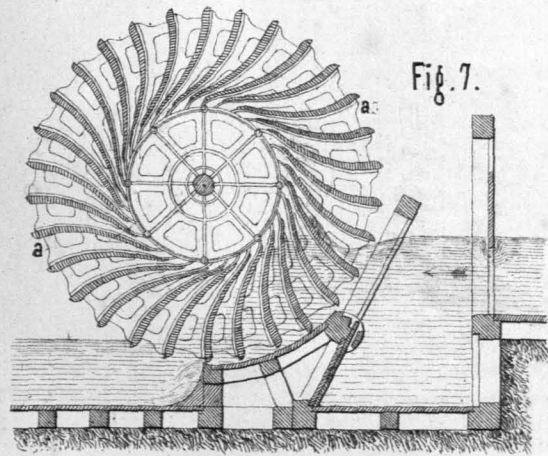
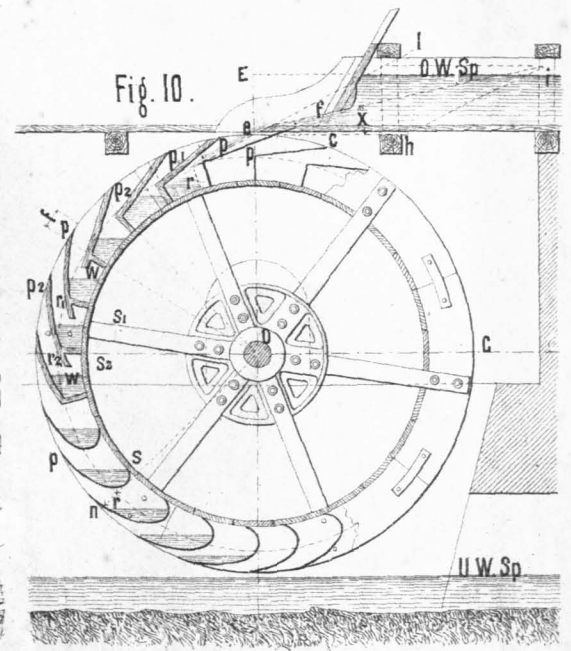
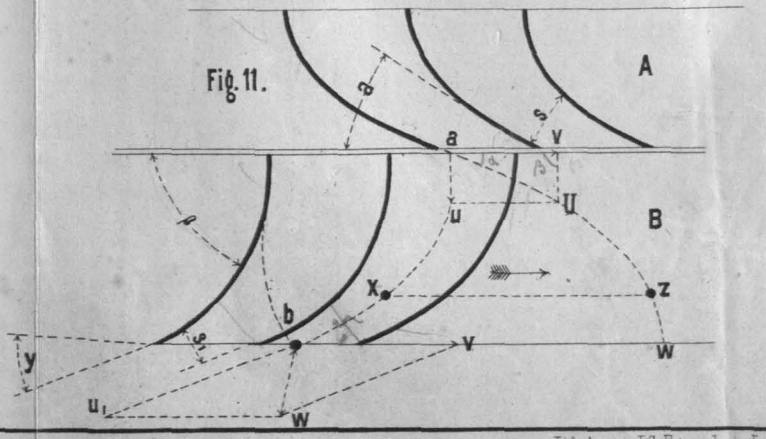
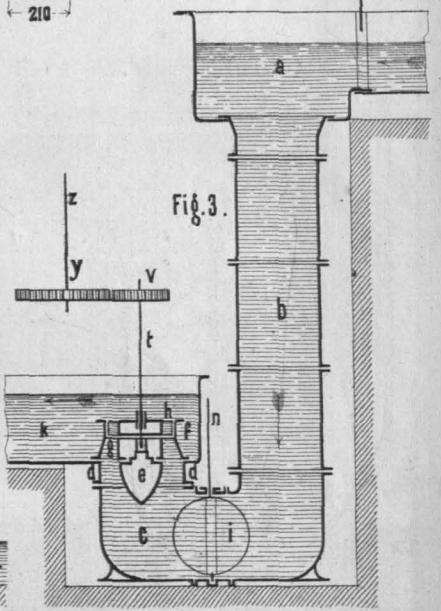
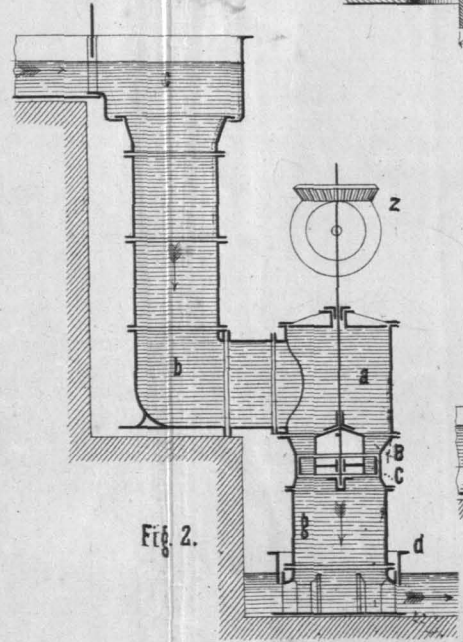
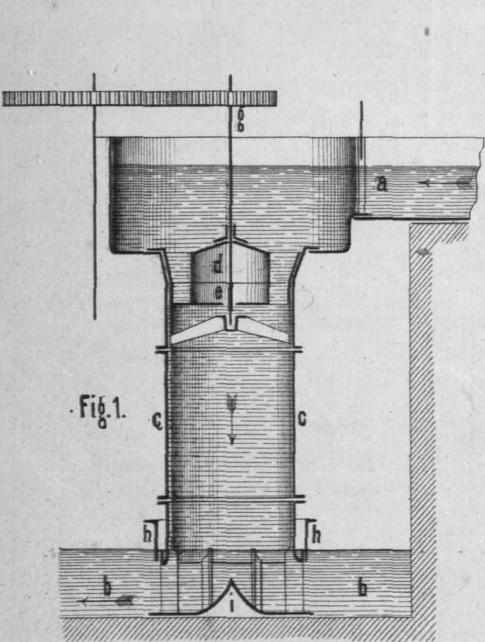
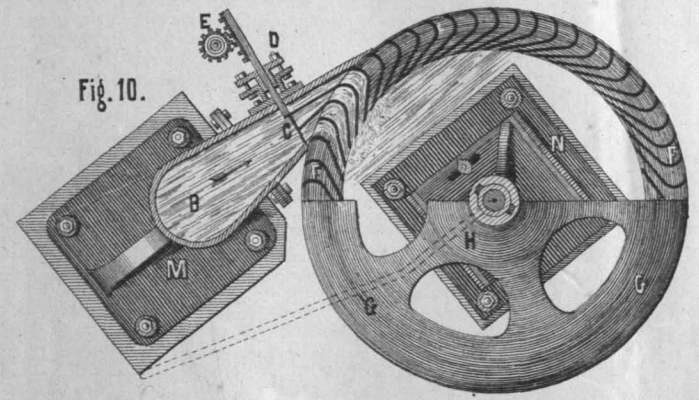
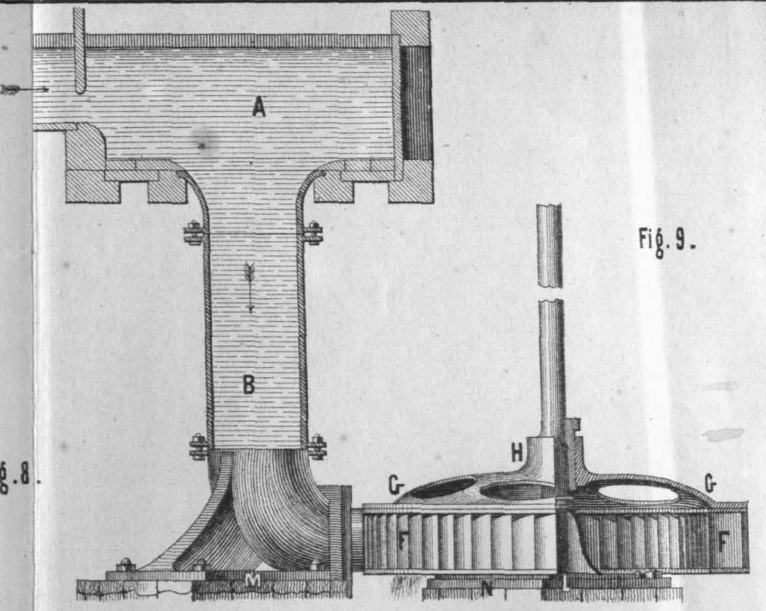
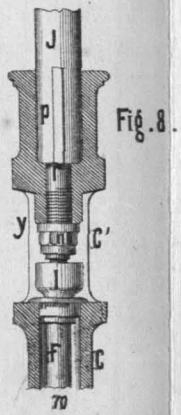
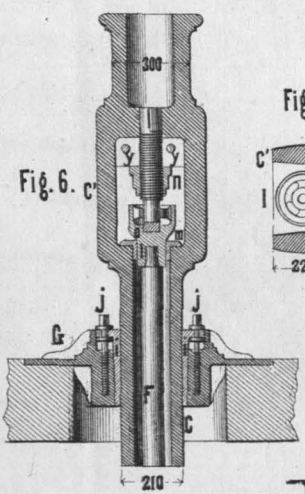
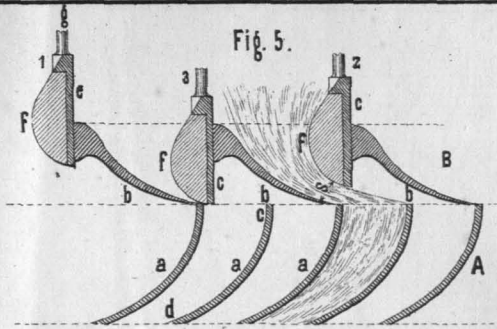
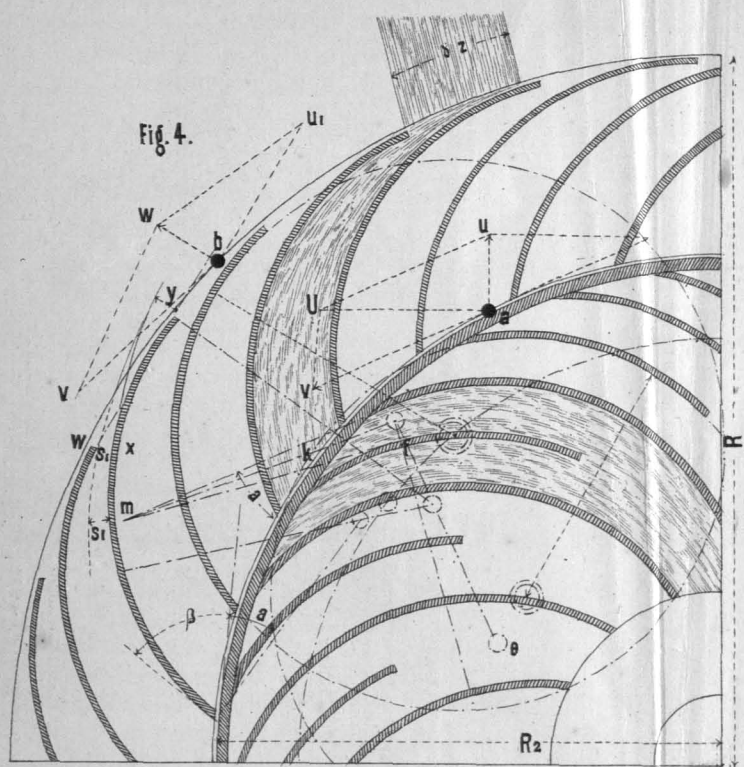
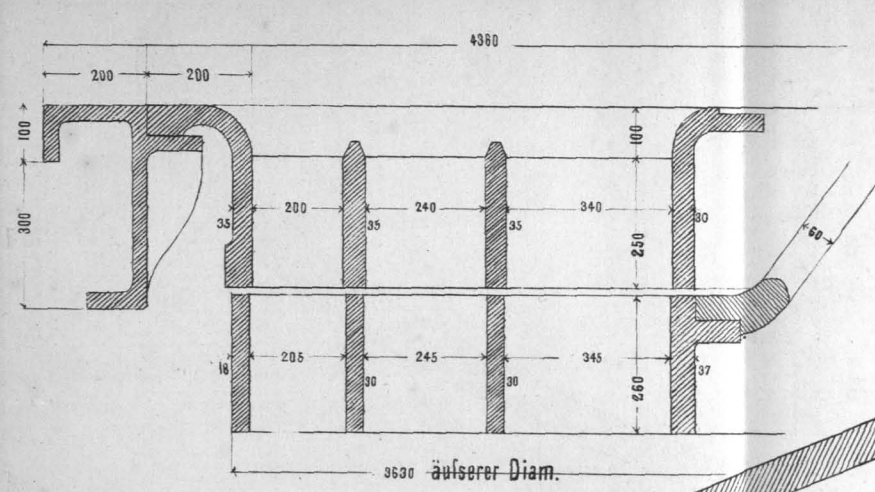


Fig. 7.

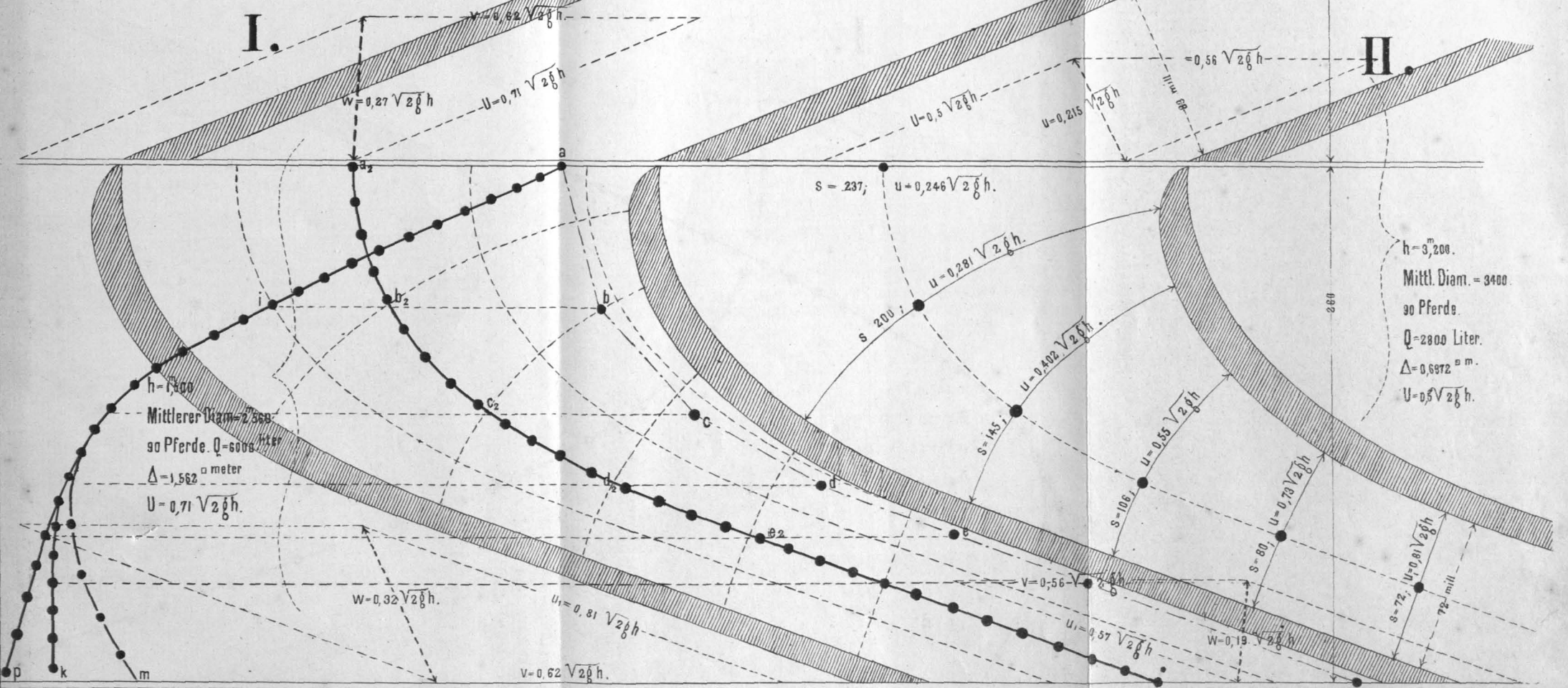




Maßstab=1: 2 1/2.

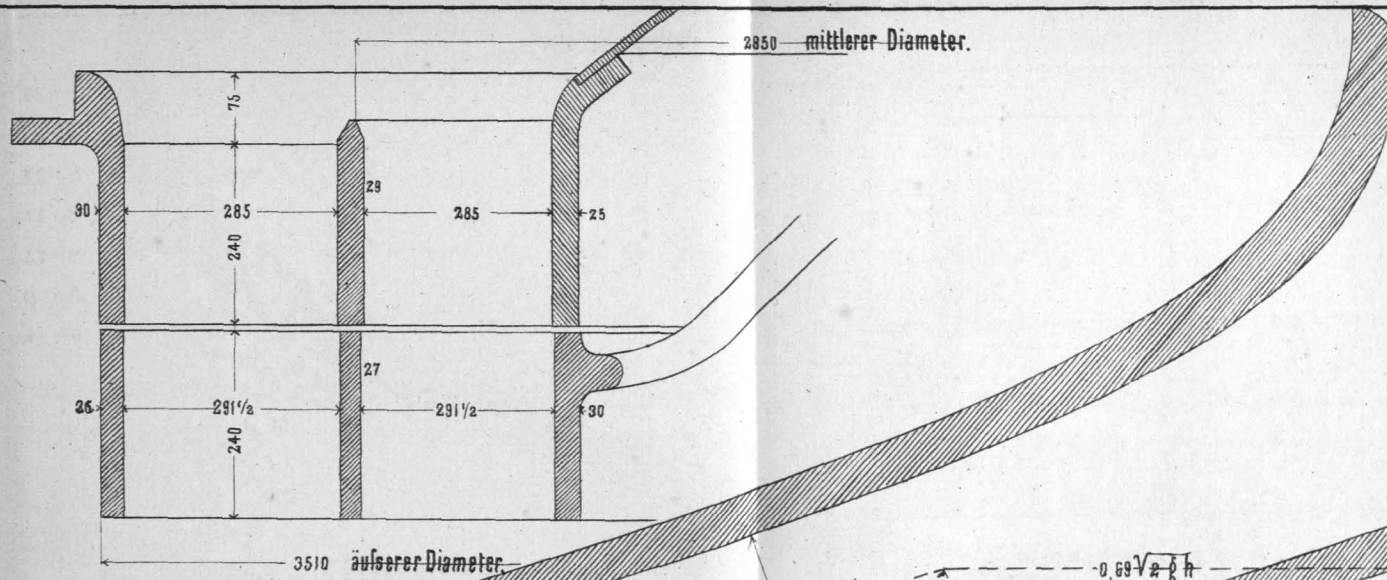
I.

II.

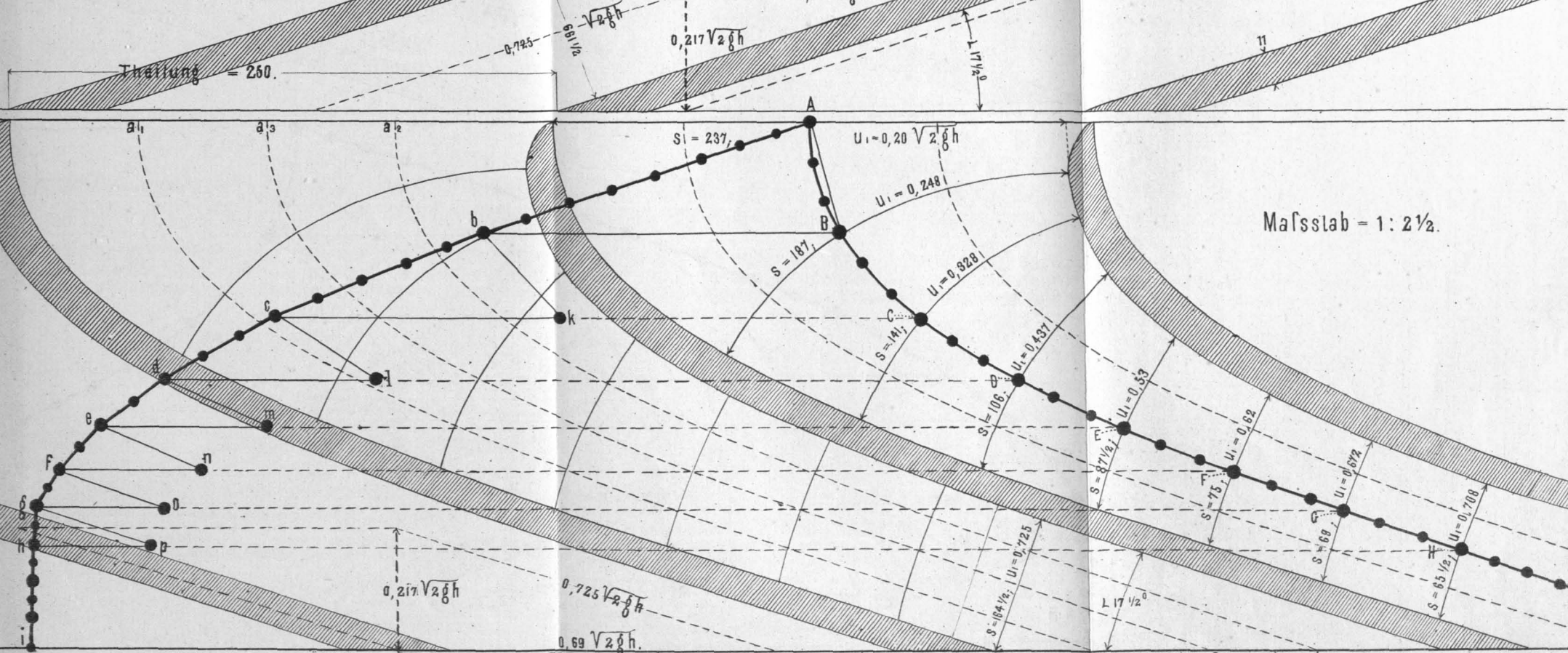


$h = 3,200$.
 Mittl. Diam. = 3400.
 90 Pferde.
 $Q = 2800$ Liter.
 $\Delta = 0,6972$ m.
 $U = 0,5 \sqrt{2gh}$.

$h = 1,500$
 Mittlerer Diam. = 2360
 90 Pferde. $Q = 6000$ Liter
 $\Delta = 1,562$ meter
 $U = 0,71 \sqrt{2gh}$.



$h = 2050, Q = 6100 \text{ Liter}$
 $N_n = 70\% = 117 \text{ Pferde}$
 $U = 0,725 \sqrt{2gh}$
 $w_1 = 0,725 \sqrt{2gh}$
 $w = 0,217 \sqrt{2gh}$
 $\Delta = 1,370^\circ \text{ m}$
 $v = 0,69 \sqrt{2gh}$



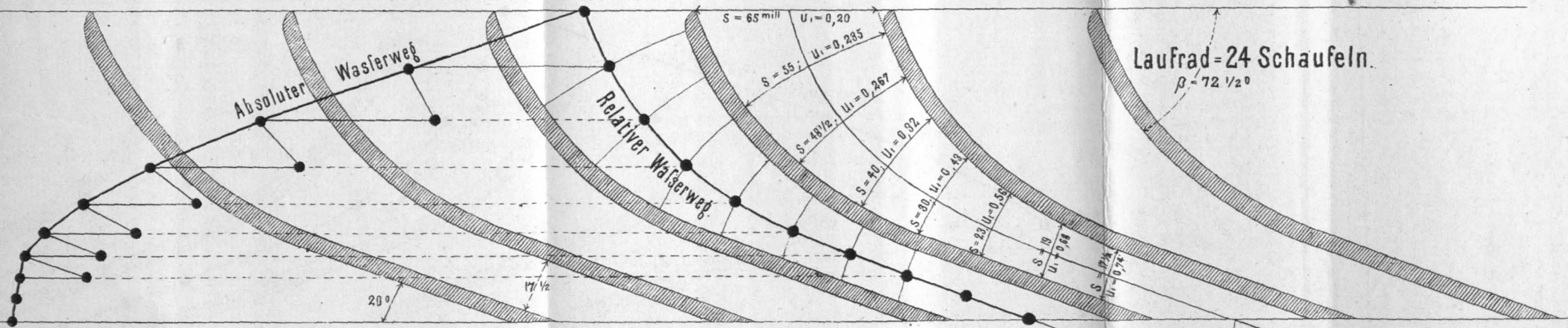
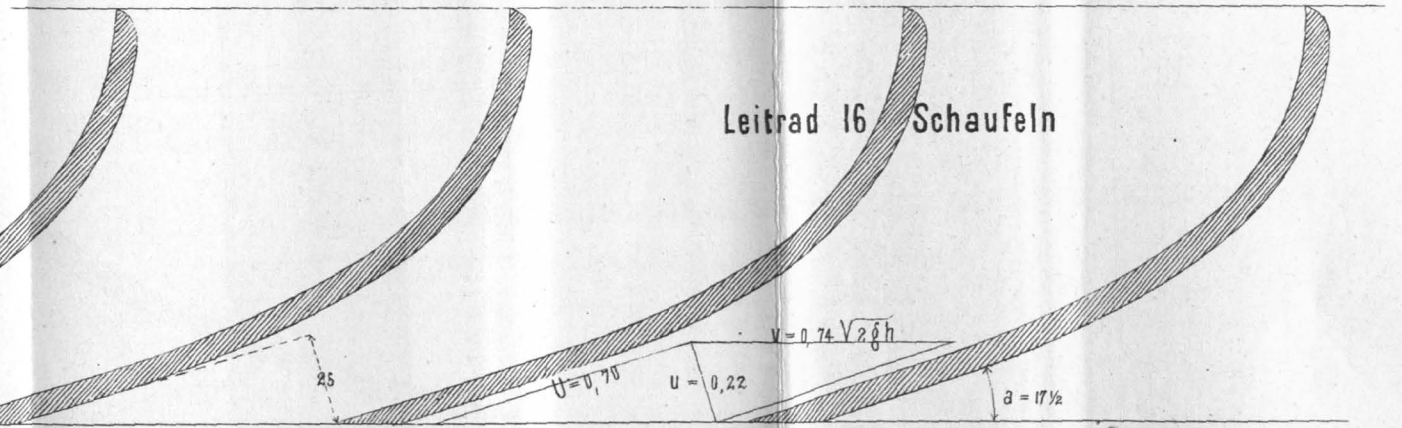
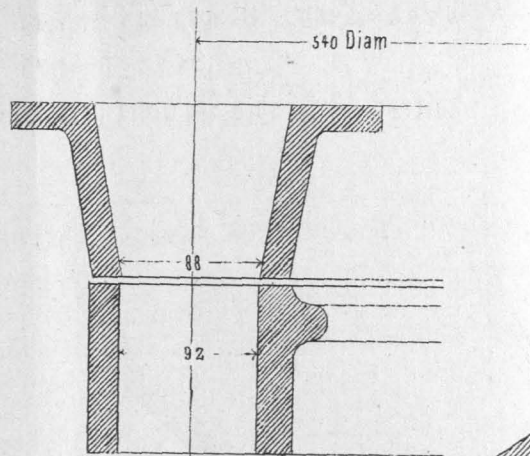
Maßstab = 1 : 2 1/2.

$h = 7,200$, $Q = 246$ Liter, N_n à $70\% = 16$ Pferde.

$\sqrt{2gh} = 11,866$, $U = 0,70\sqrt{2gh} = 8,32^m$

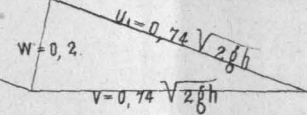
$v = 0,74\sqrt{2gh} = 8,79^m$

Leitrad 16 Canäle, 88 breit, 25 weit = $0,0352^m$ Ausflussquerschnitt.



$a + \beta = 90^\circ$, $\frac{\sin \beta}{\cos a \cdot \sin(a + \beta)} = 1$.
 $U = \sqrt{gh} = 0,707 \sqrt{2gh}$

Maßstab = 1 : 2.

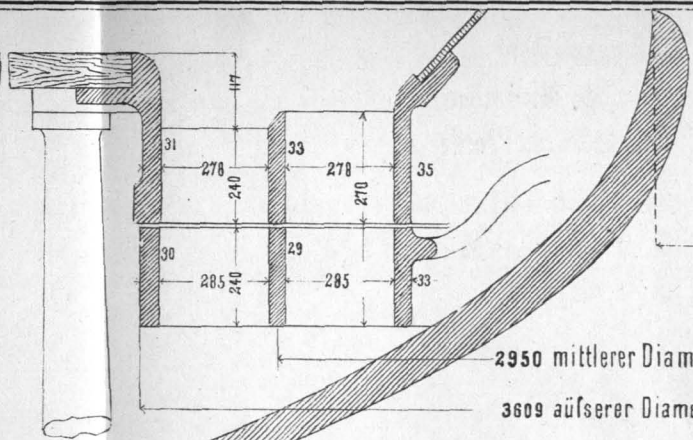


$Q = 6350$ Liter.
 $h = 1,700$ Minimum.
 $N \text{ à } 70\% = 100$ Pferde.

$\frac{\sin \beta}{\cos. a \cdot \sin(a + \beta)} = 1,126.$

$U = \sqrt{1,126 gh} = 4,33 = 0,75 \sqrt{2gh}$

$u_1 = 0,703 \sqrt{2gh}$



2950 mittlerer Diameter
 3609 äußerer Diameter

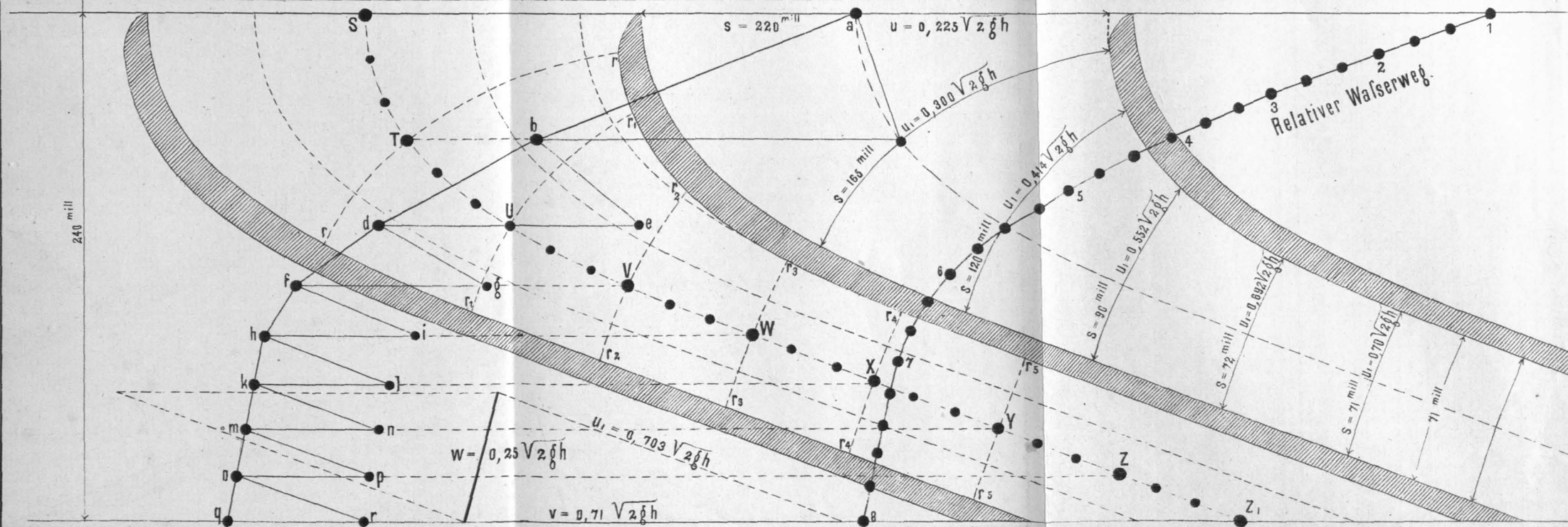
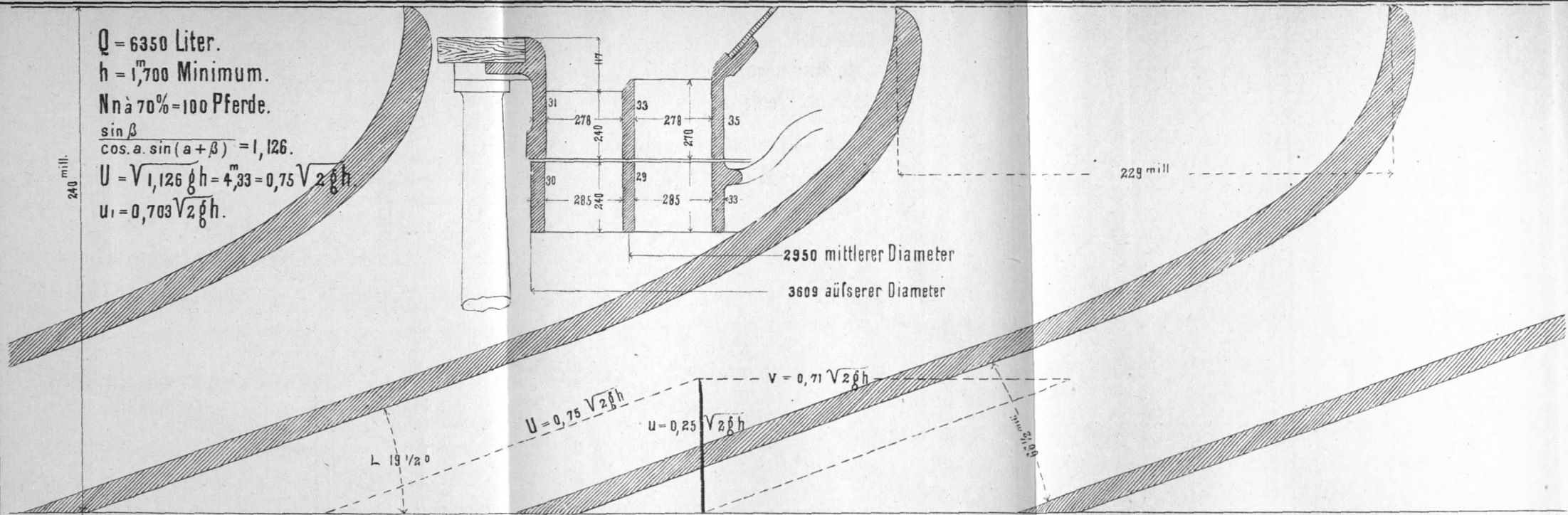


Fig. 1. Maßstab = 1:3.

$Q = 1996$ Liter theor. = 1950 Liter effectiv.
 $h = 2,200$ Meter. $N_n \text{ à } 75\% = 43$ Pferde.
 30 Canäle 63 weit, 180 breit = $\Delta = 0,3402$ Meter
 $U = 0,90 \sqrt{2gh} = 1,98$ m. $v = 0,58 \sqrt{2gh}$
 $u = 0,44 \sqrt{2gh}$

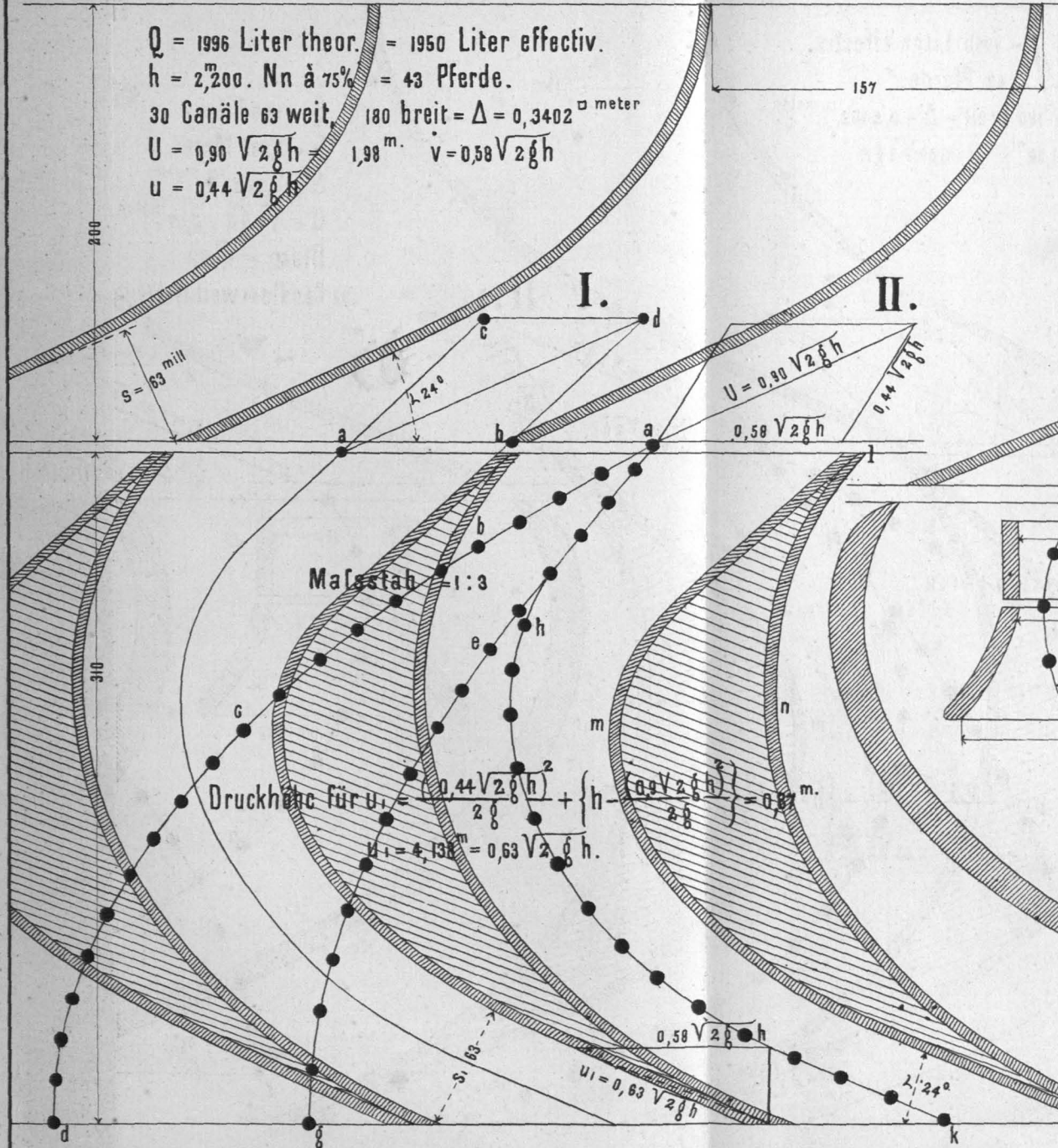
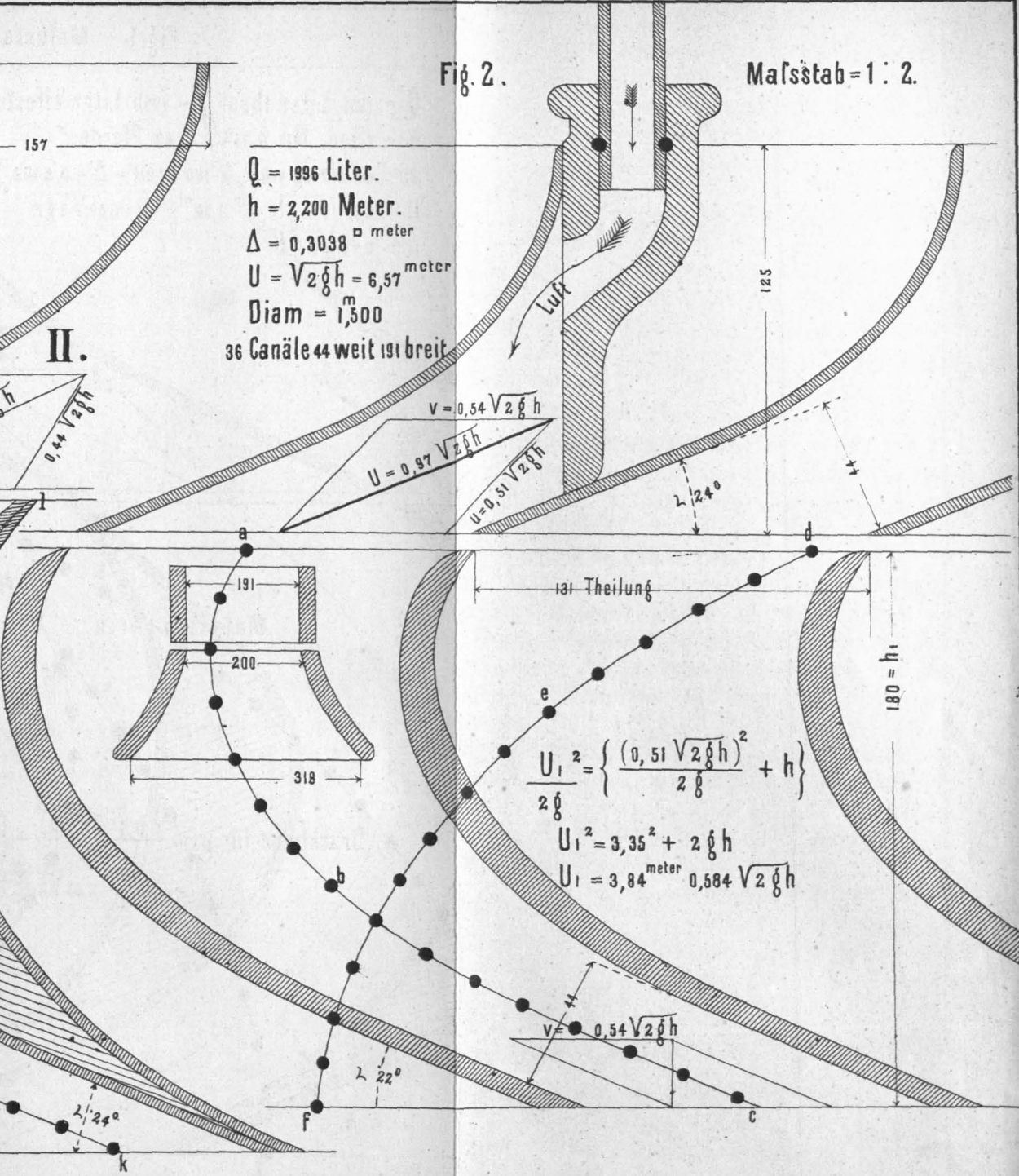
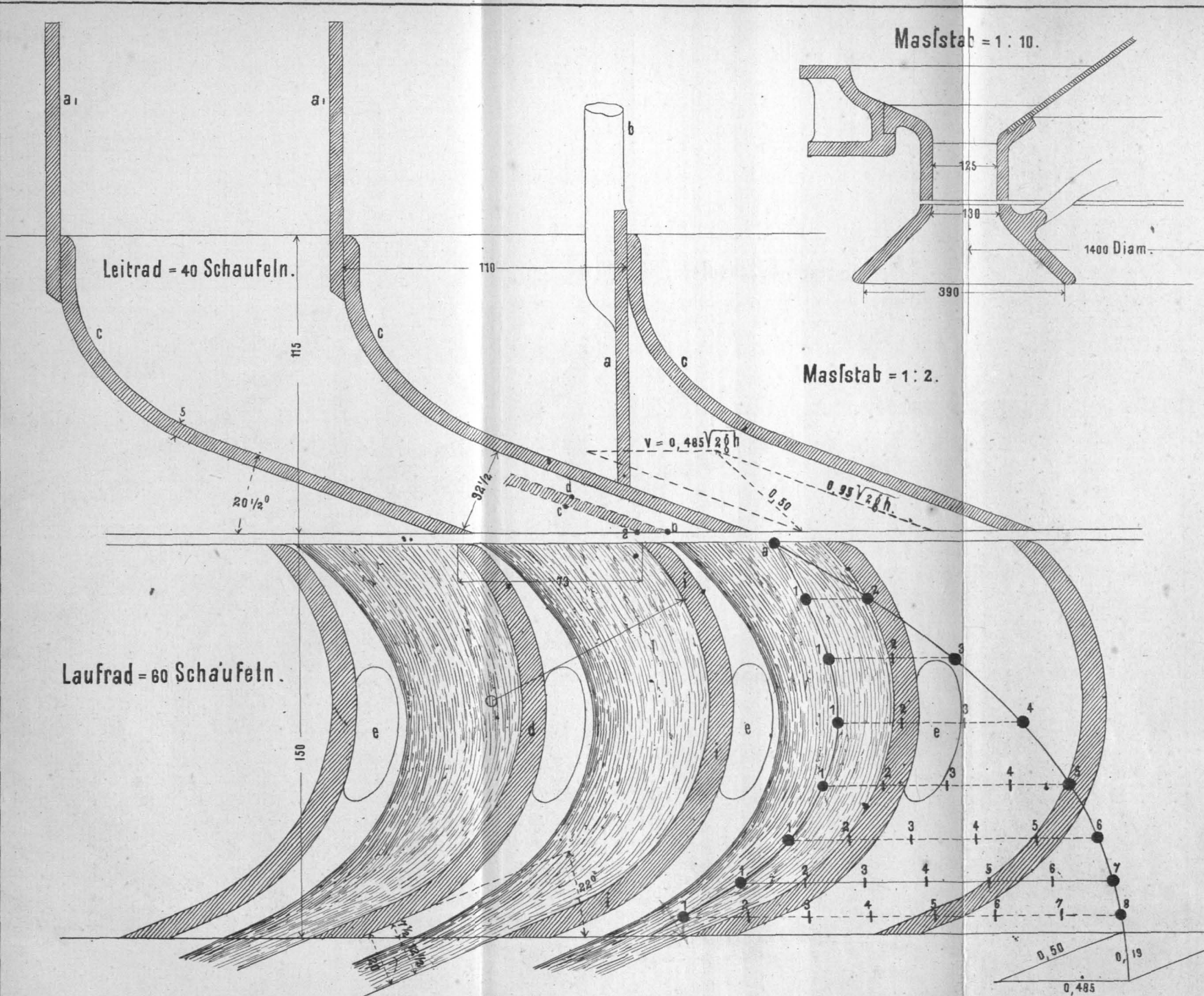


Fig. 2.

Maßstab = 1:2.

$Q = 1996$ Liter.
 $h = 2,200$ Meter.
 $\Delta = 0,3038$ Meter
 $U = \sqrt{2gh} = 6,57$ Meter
 $\text{Diam} = 1,500$
 36 Canäle 44 weit 191 breit





Masstab = 1 : 10.

Masstab = 1 : 2.

Daten.

$h = 9,000.$
 $Q = 2000$ Liter.
 $Nn \text{ à } 75\% = 180$ Pferde.
 Leitrad = 40 Canäle von $32\frac{1}{2}$ mill.
 normaler Weite u. 125 mill Breite
 $\Delta = 0,1625$ meter.
 $\sqrt{2gh} = 13,270.$
 $U = \frac{2000}{0,1625} = 12,30^m = 0,93 \sqrt{2gh}.$
 88 revol; $v = \frac{88 \times 4398}{60} = 6,45 = 0,485\sqrt{2gh}$
 $y = 3,38$; $\lambda = 20\frac{1}{2}^\circ$; Austrittsverlust =
 $= \frac{0,19^2}{0,93^2} = \text{circa } 4\%.$

Fig. 2.

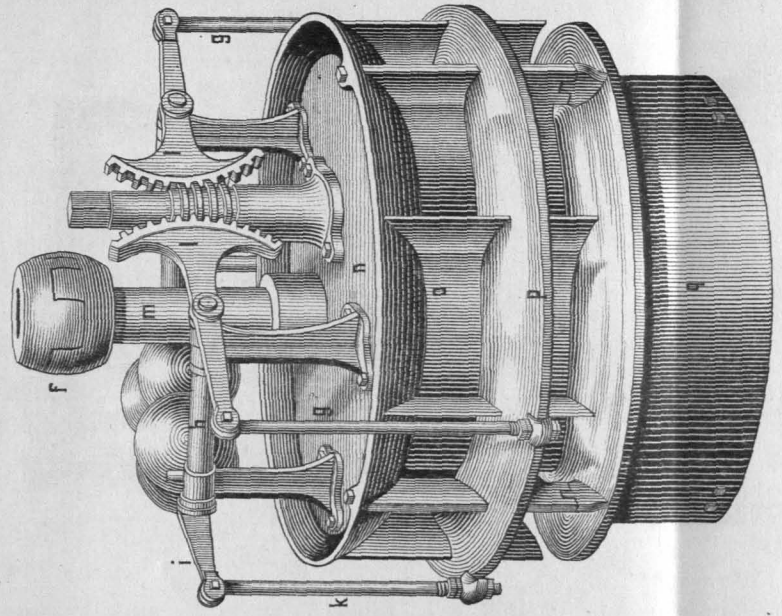


Fig. 3.

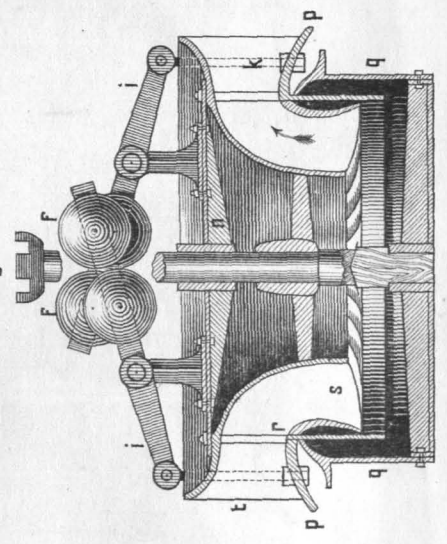


Fig. 4.

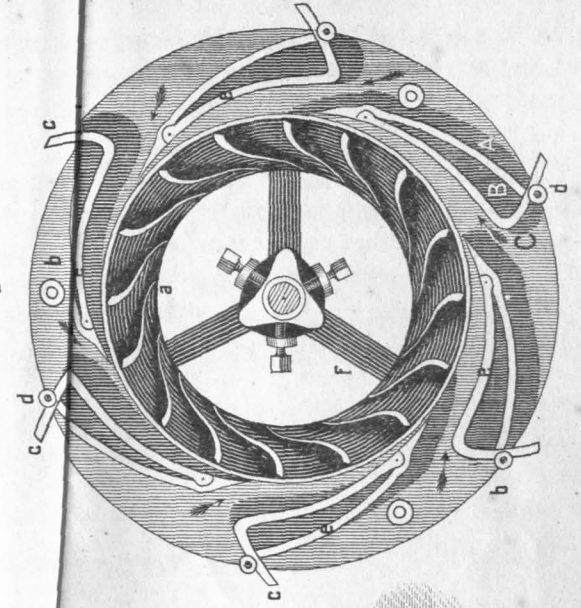


Fig. 1.

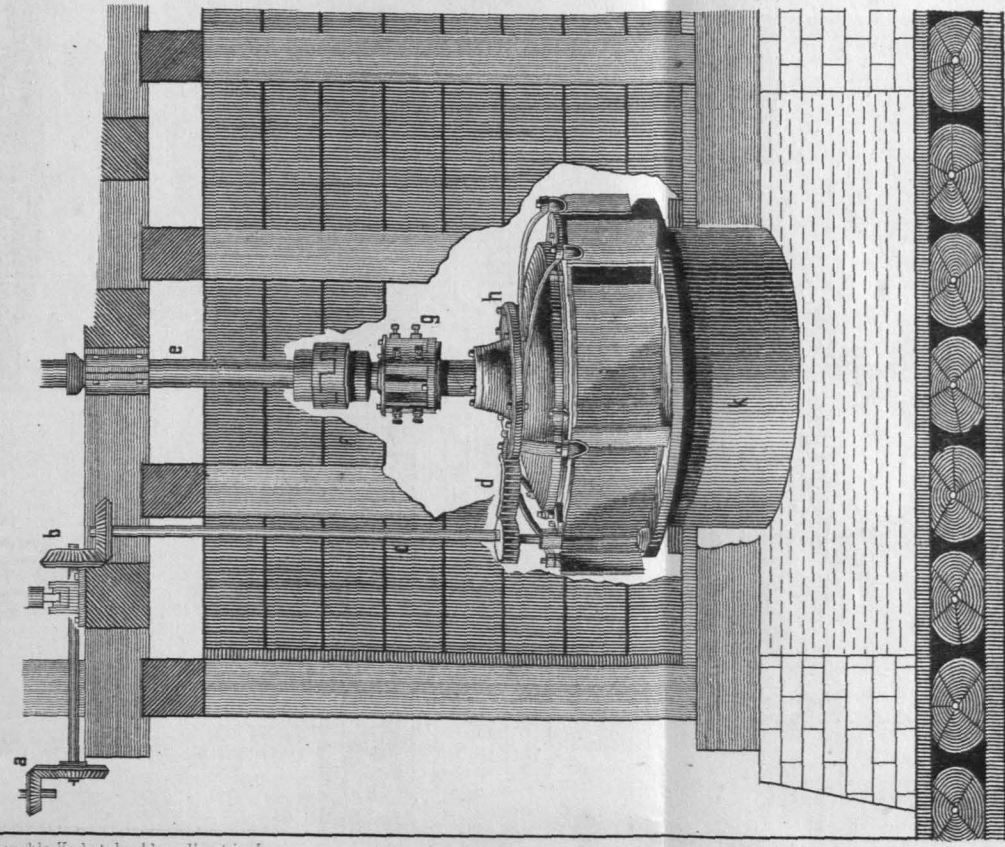
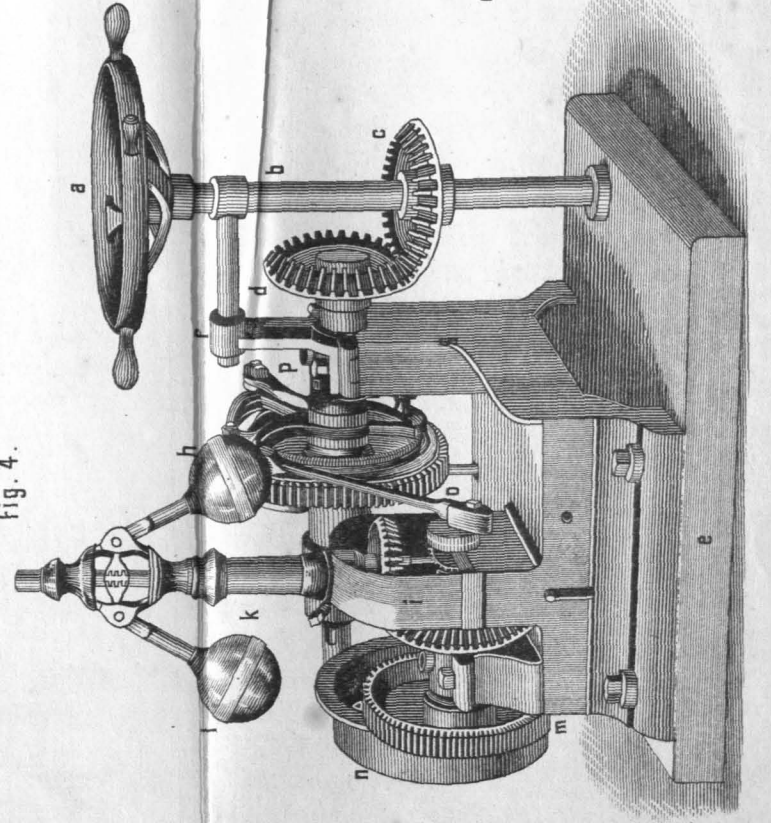
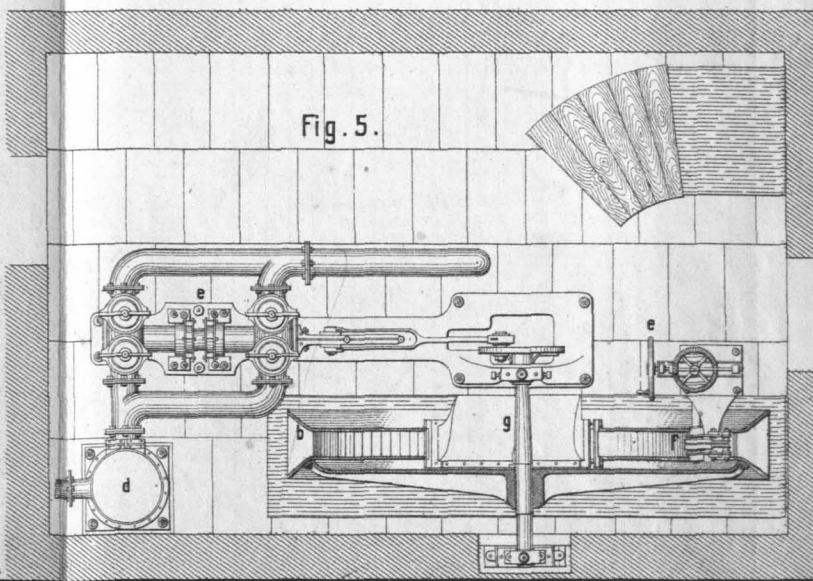
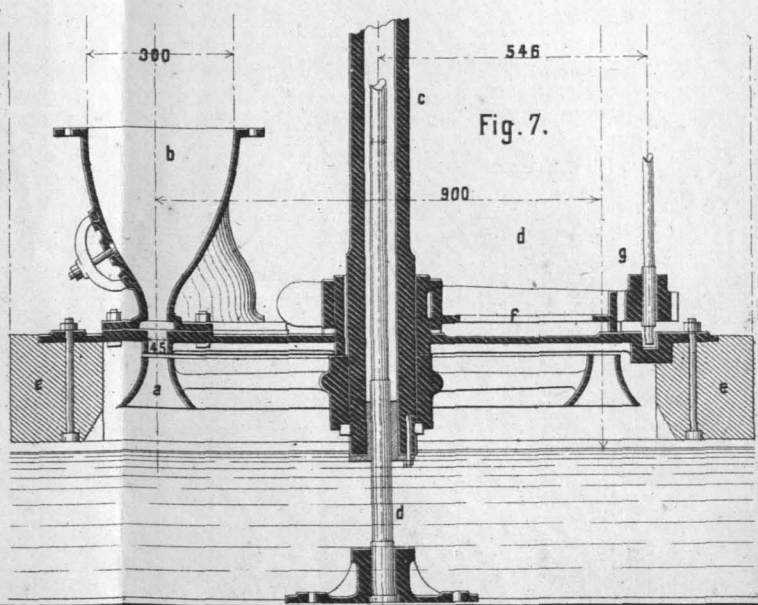
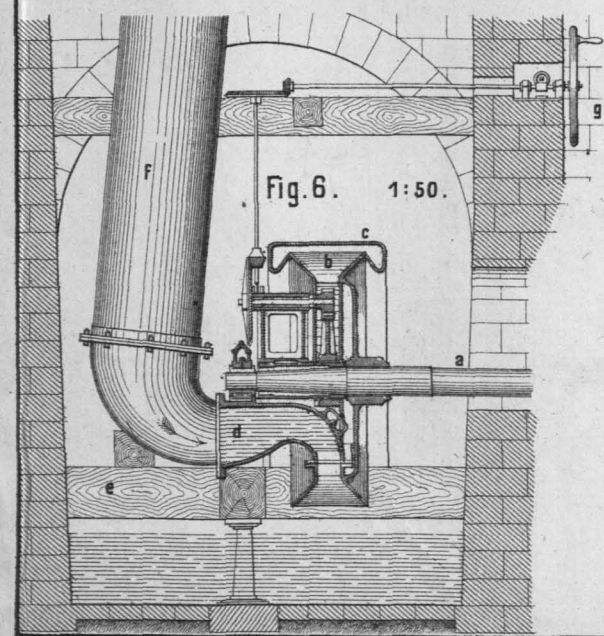
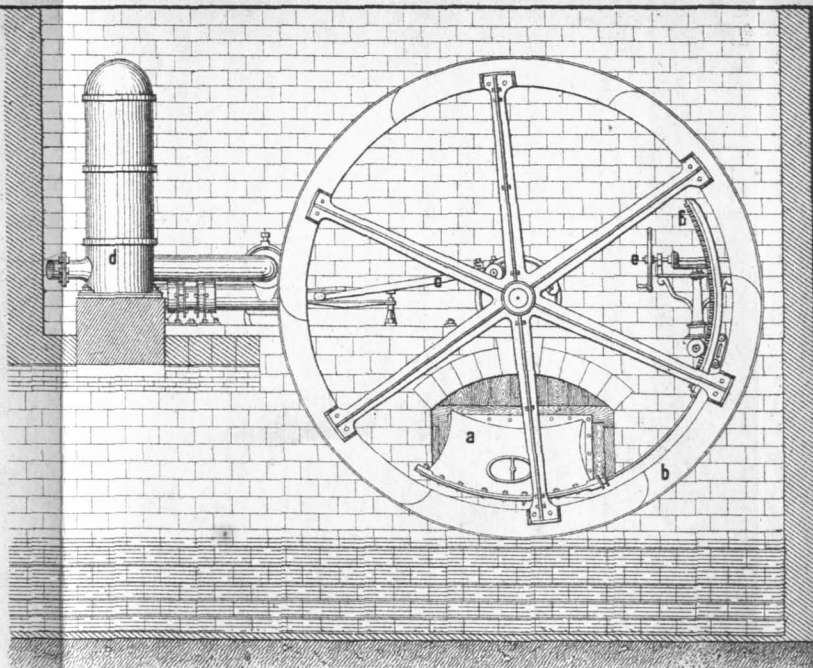
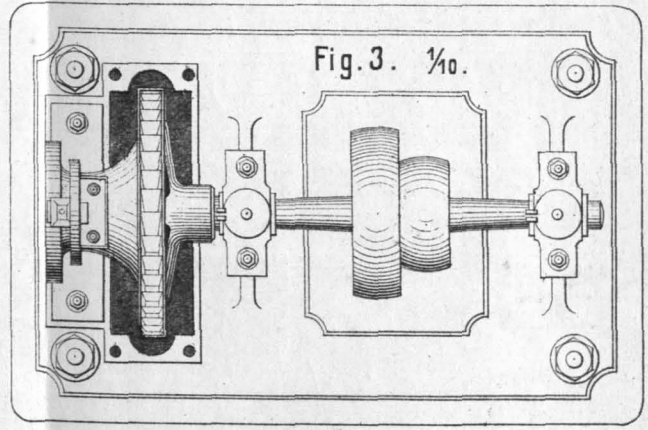
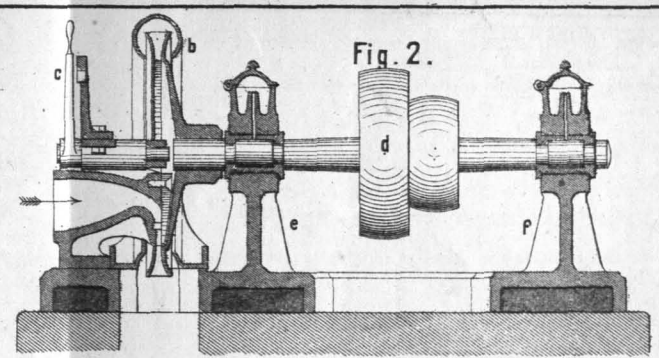
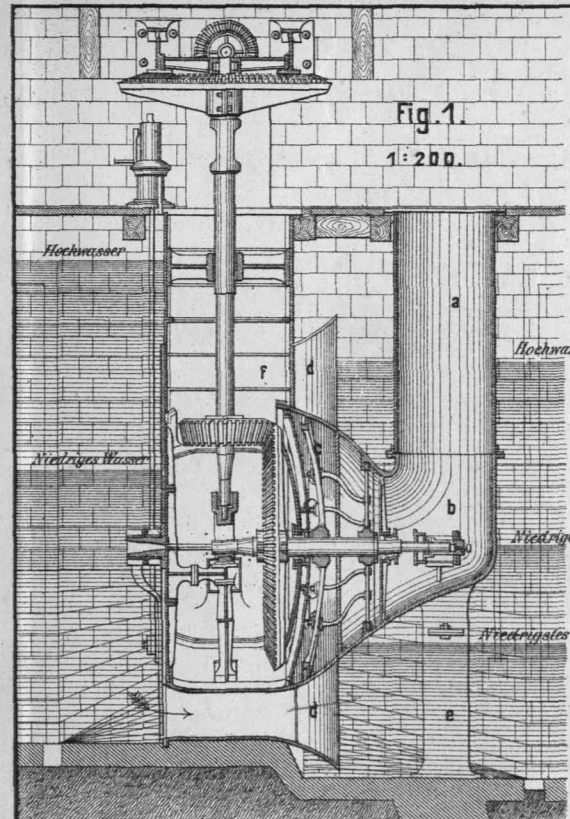


Fig. 4.





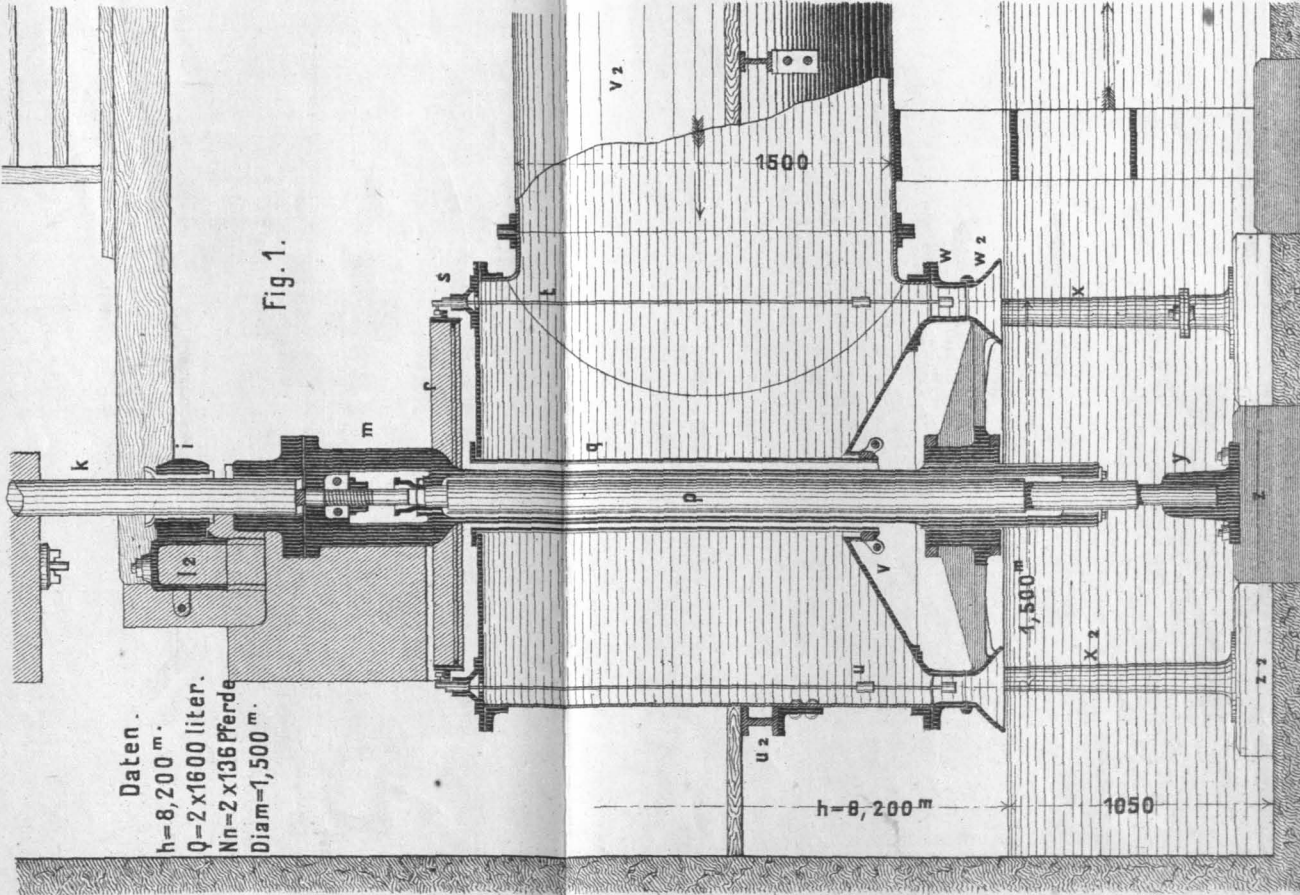
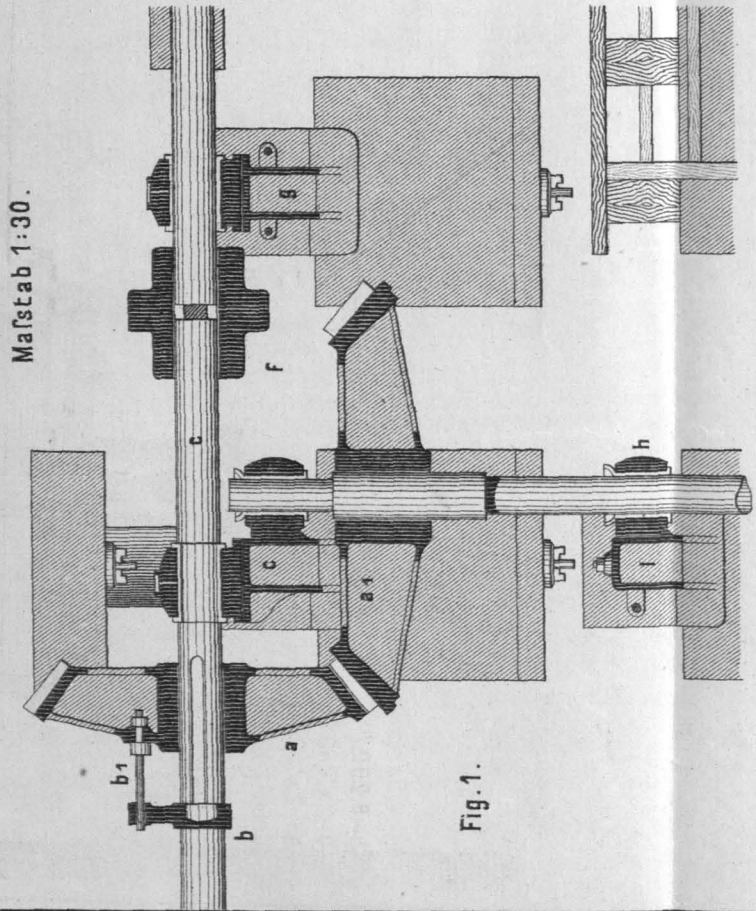
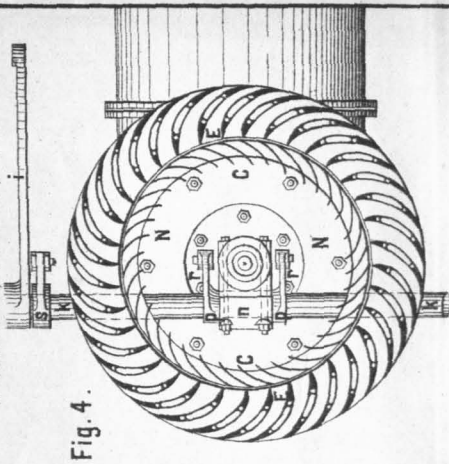
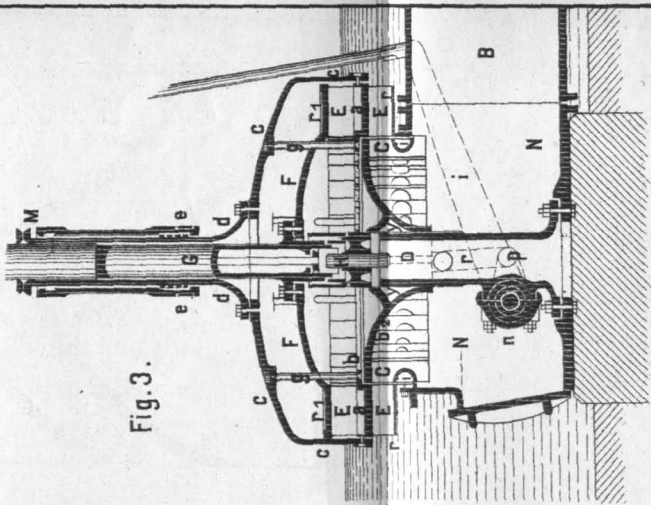
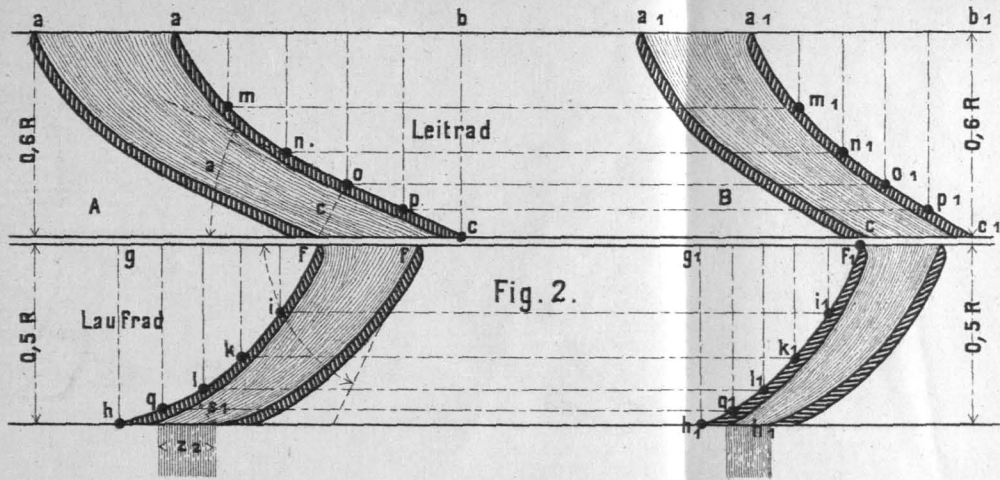
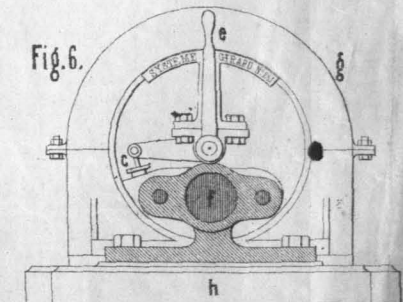
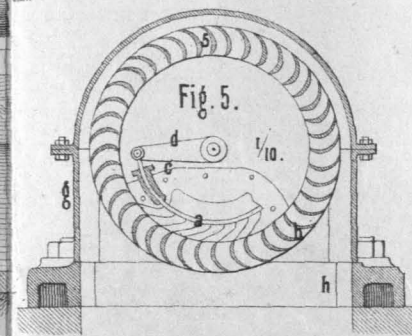
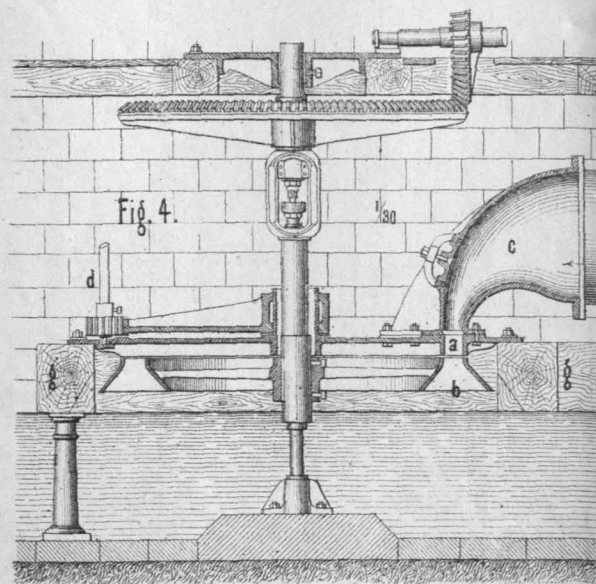
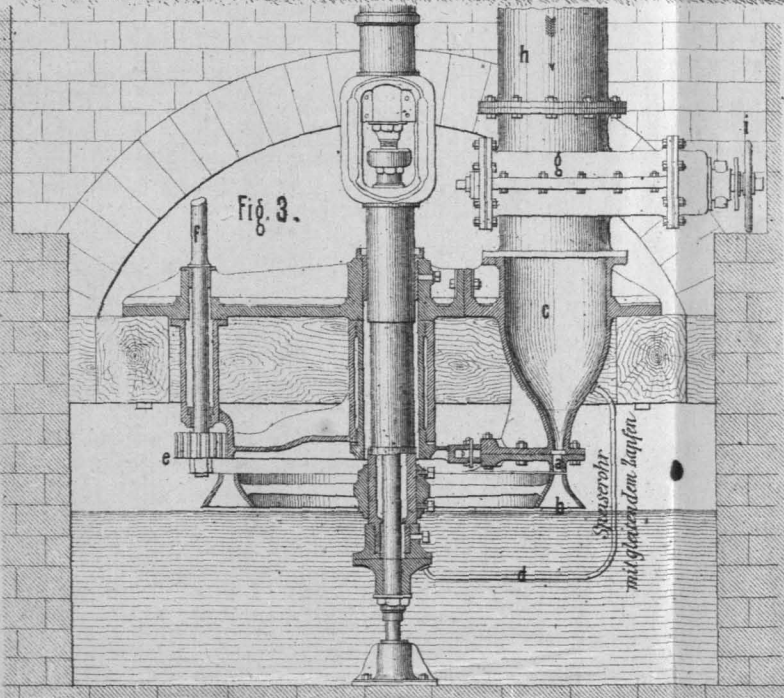
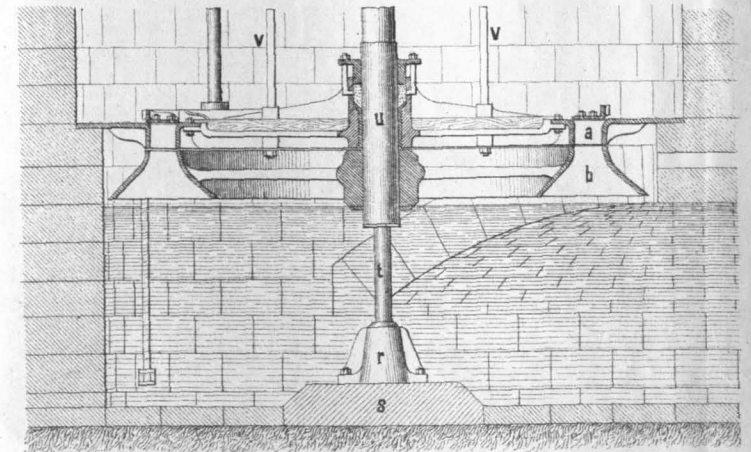
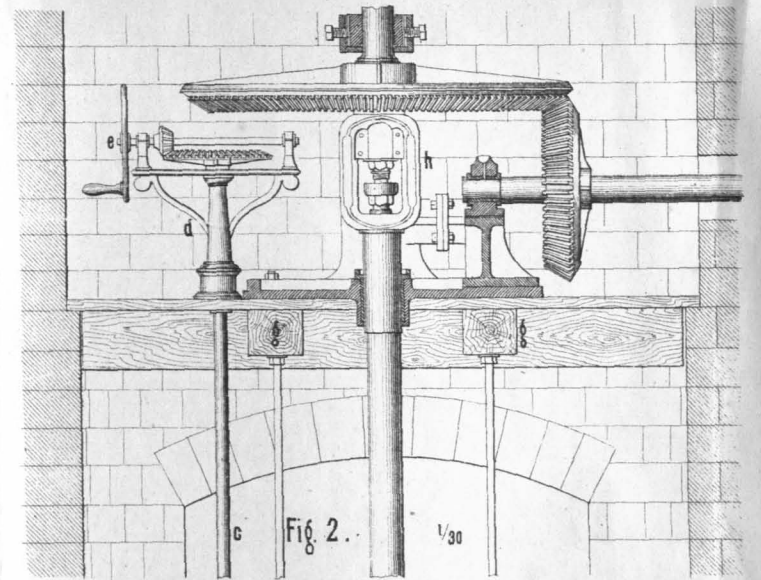
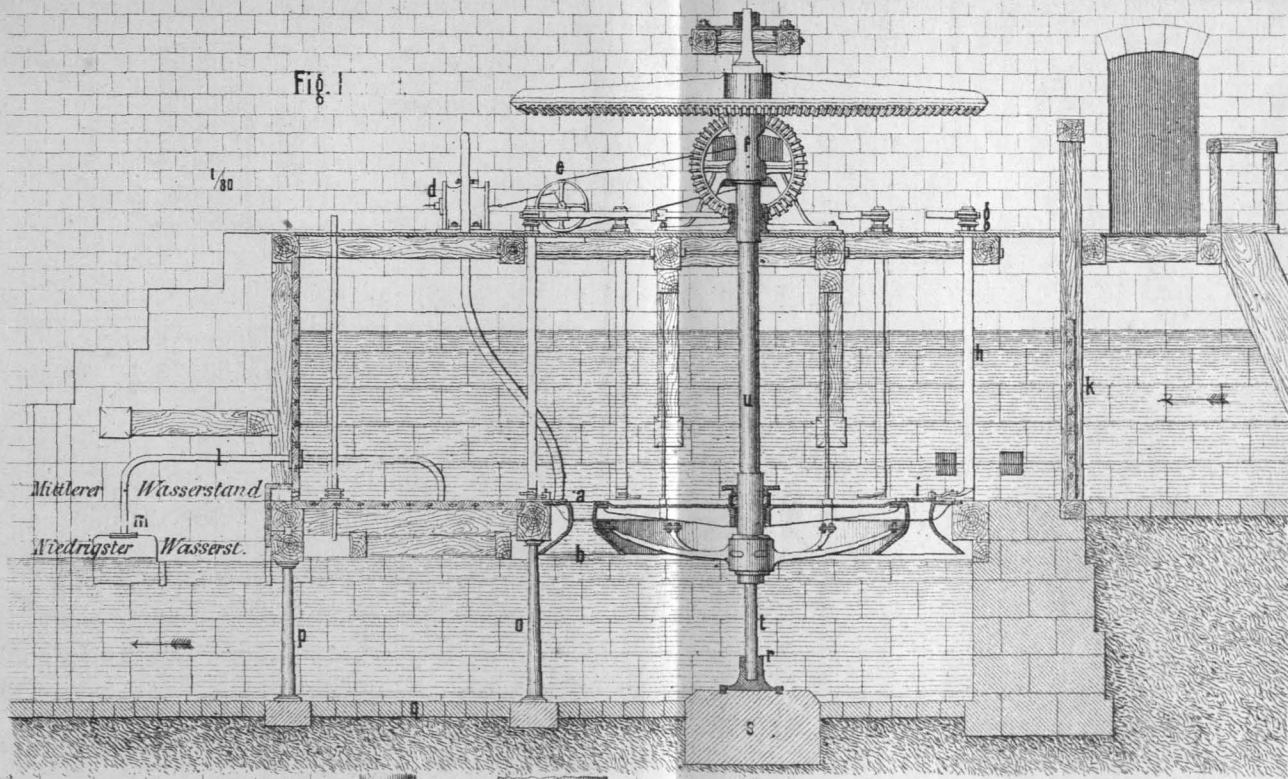


Fig. 1. Girardturbinen der Floretspinnerei Alioth & Cie in Arlesheim bei Basel. Installation von Socir & Wick in Basel.



Daten I.
 h=100 Meter.
 Q=11,5 liter.
 Nn=11½ Pferde.
 Δ=3,2^q Centimeter.
 Revol.=500.

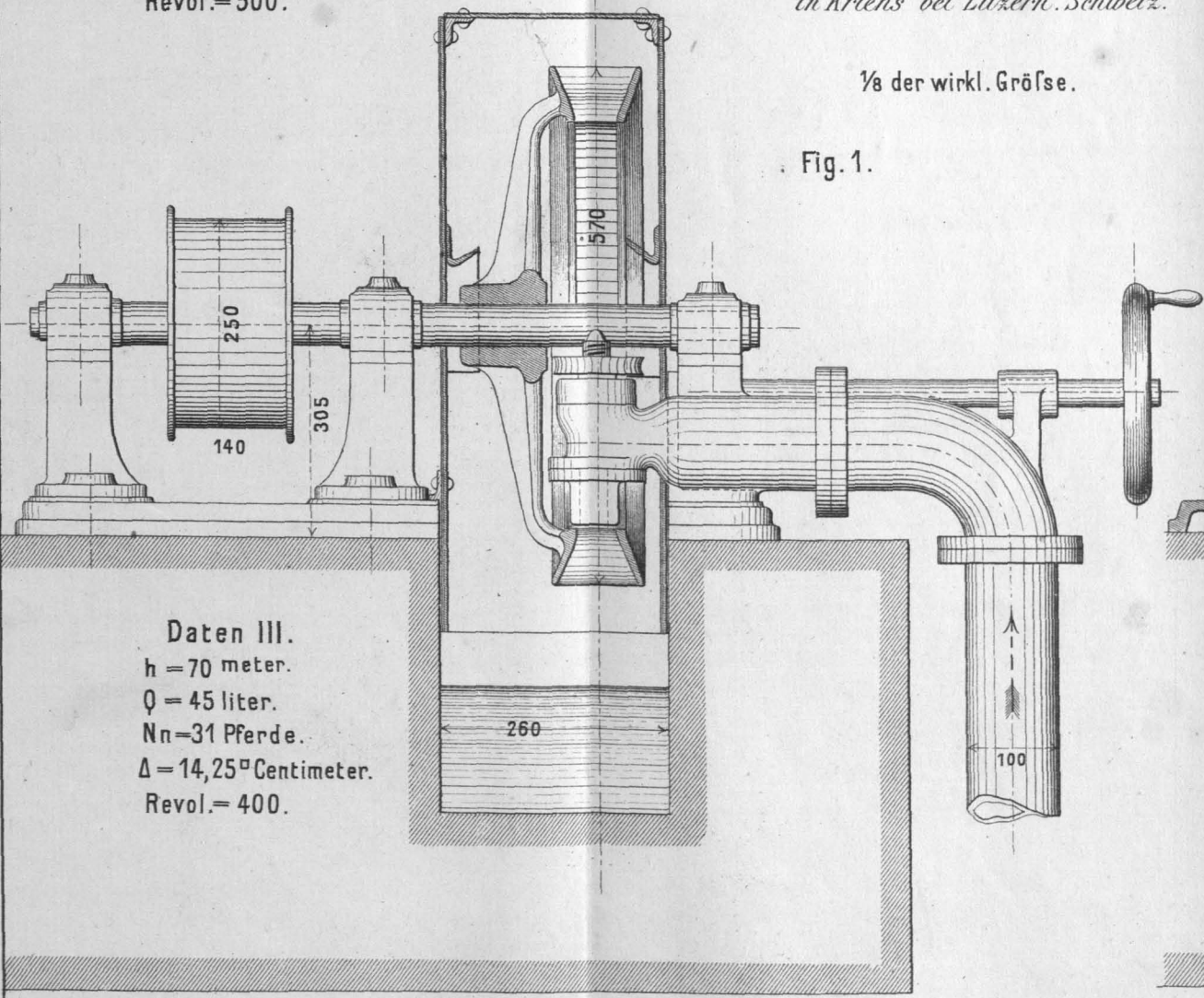
Hochdruck-Turbine für Klein-Industrie

— von Theodor Bell & Cie —

in Kriens bei Luzern, Schweiz.

⅛ der wirkl. Größe.

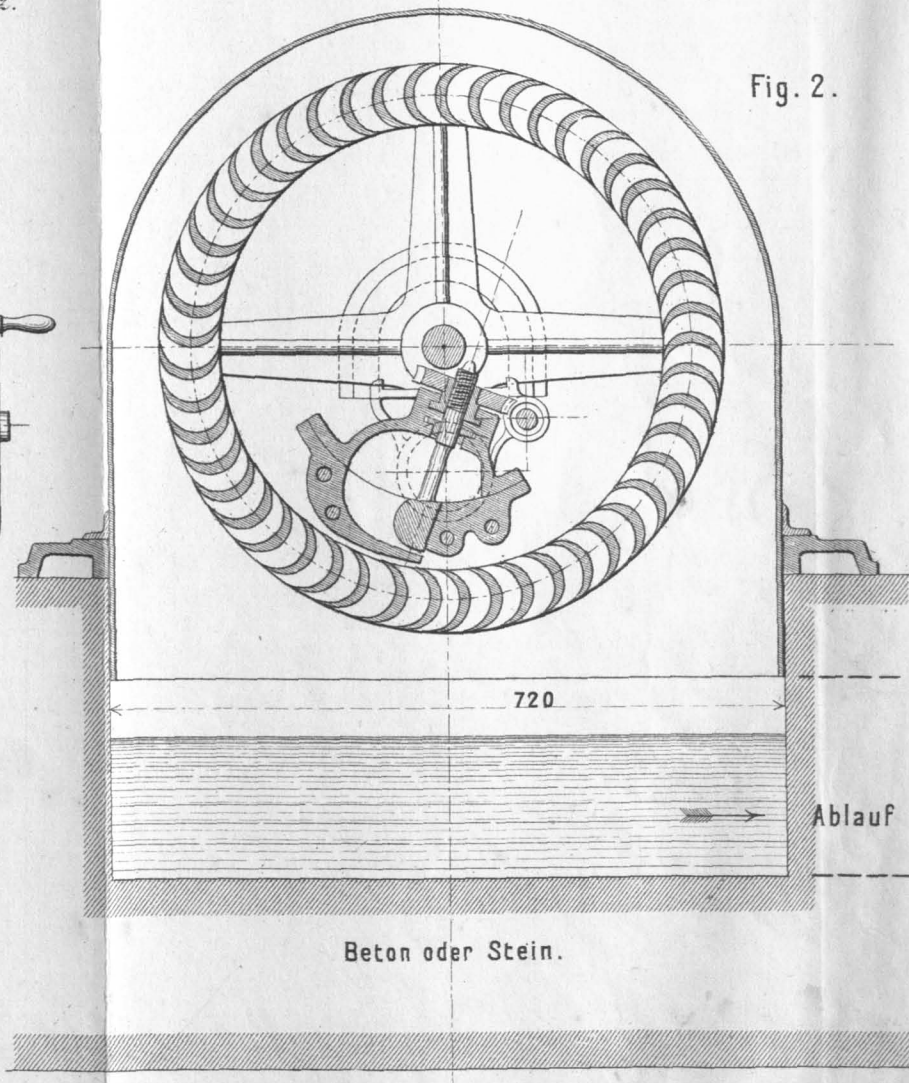
Fig. 1.



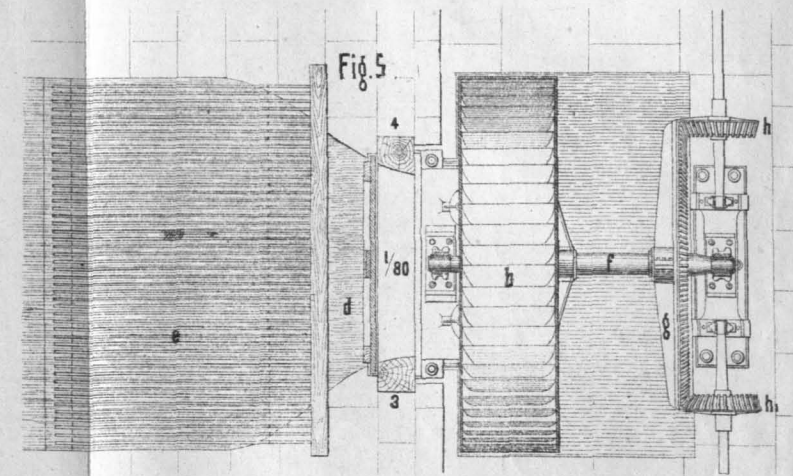
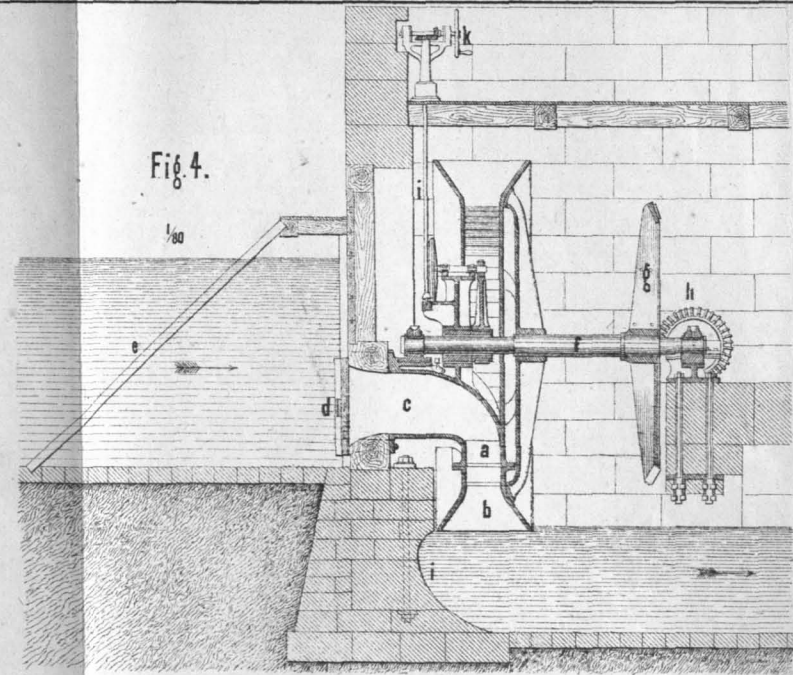
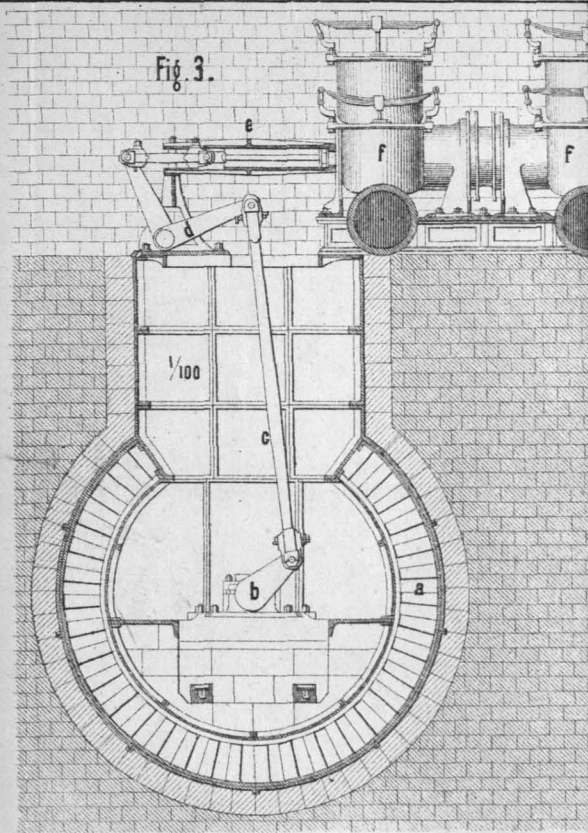
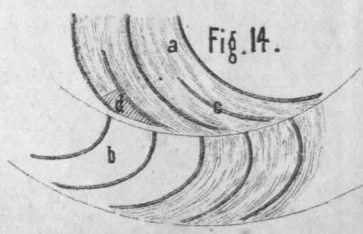
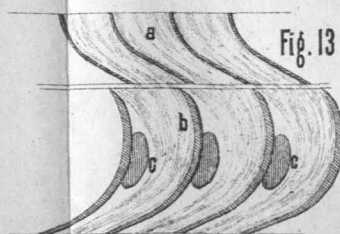
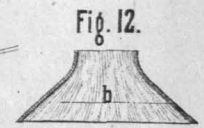
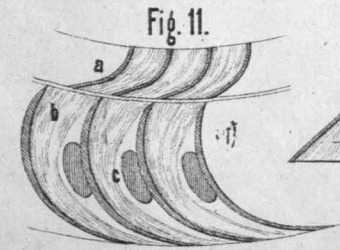
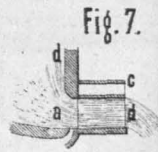
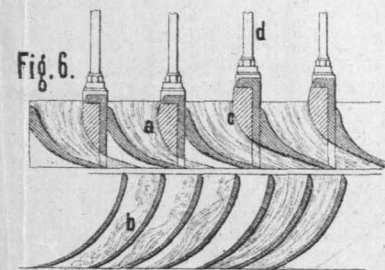
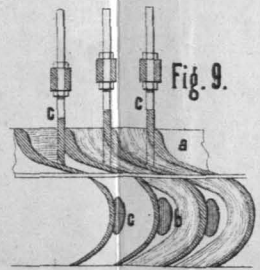
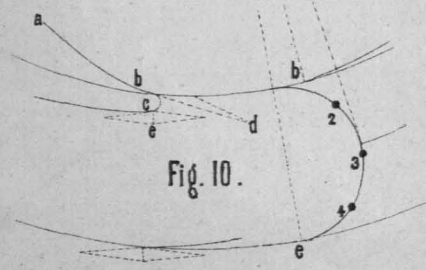
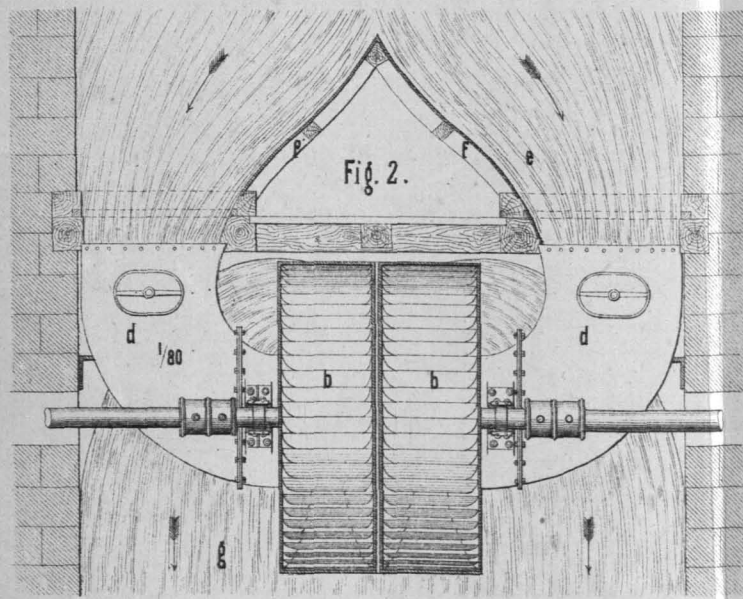
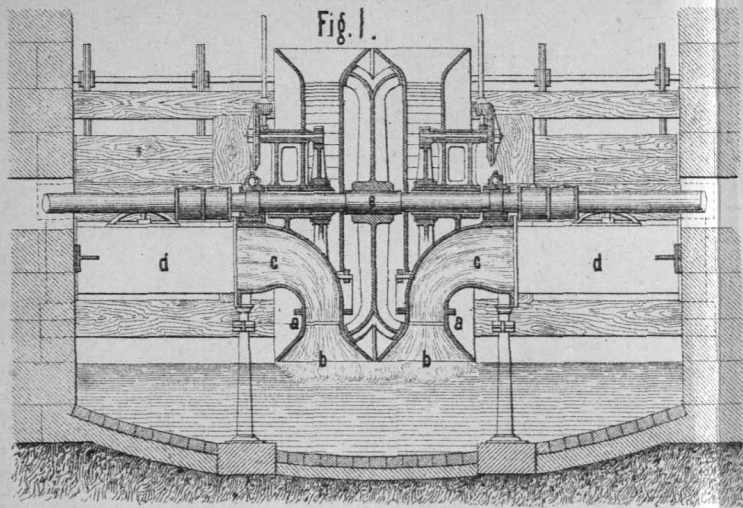
Daten III.
 h=70 meter.
 Q=45 liter.
 Nn=31 Pferde.
 Δ=14,25^q Centimeter.
 Revol.=400.

Daten II.
 h=100 meter.
 Q=3 liter.
 Nn=3 Pferde.
 Δ=0,9^q Centimeter.
 Revol.=600.

Fig. 2.



"	"	"	3	"	10	"	"	"	"	"	"	750	"	"	"
"	"	"	10	"	30	"	"	"	"	"	"	900	"	"	"



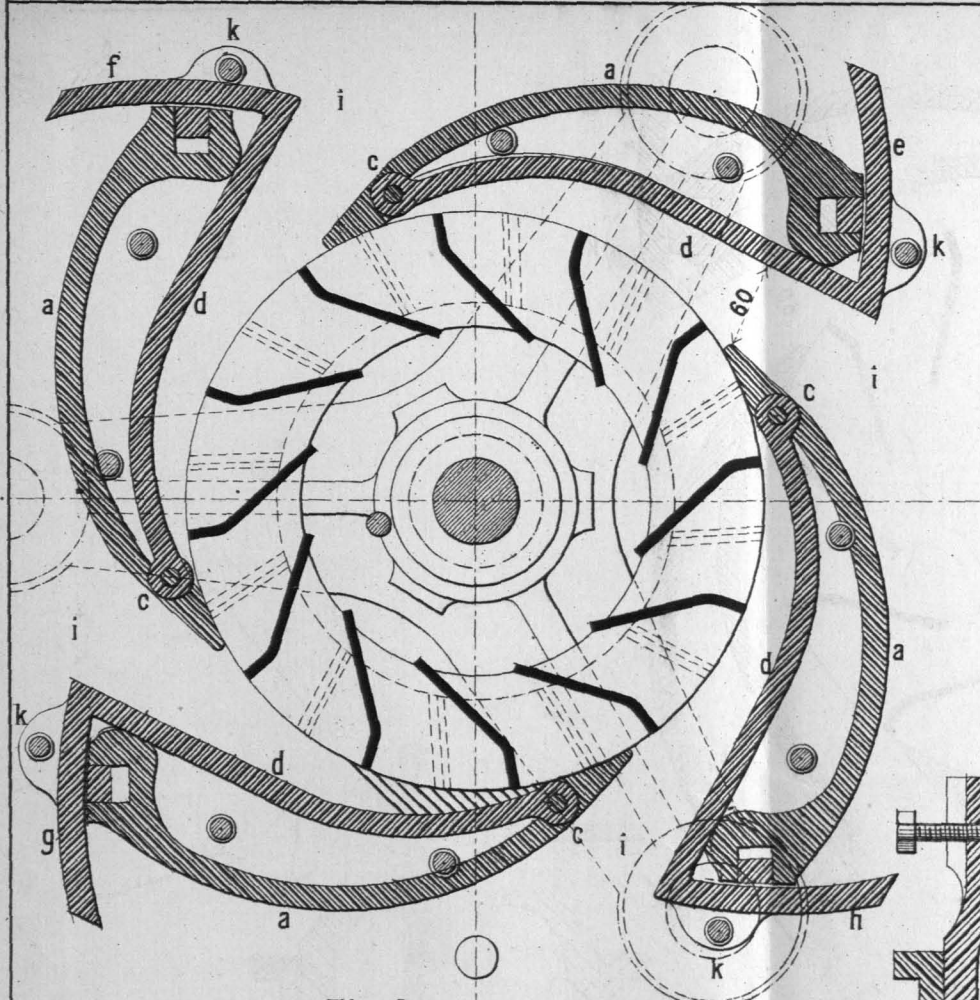


Fig. 1.

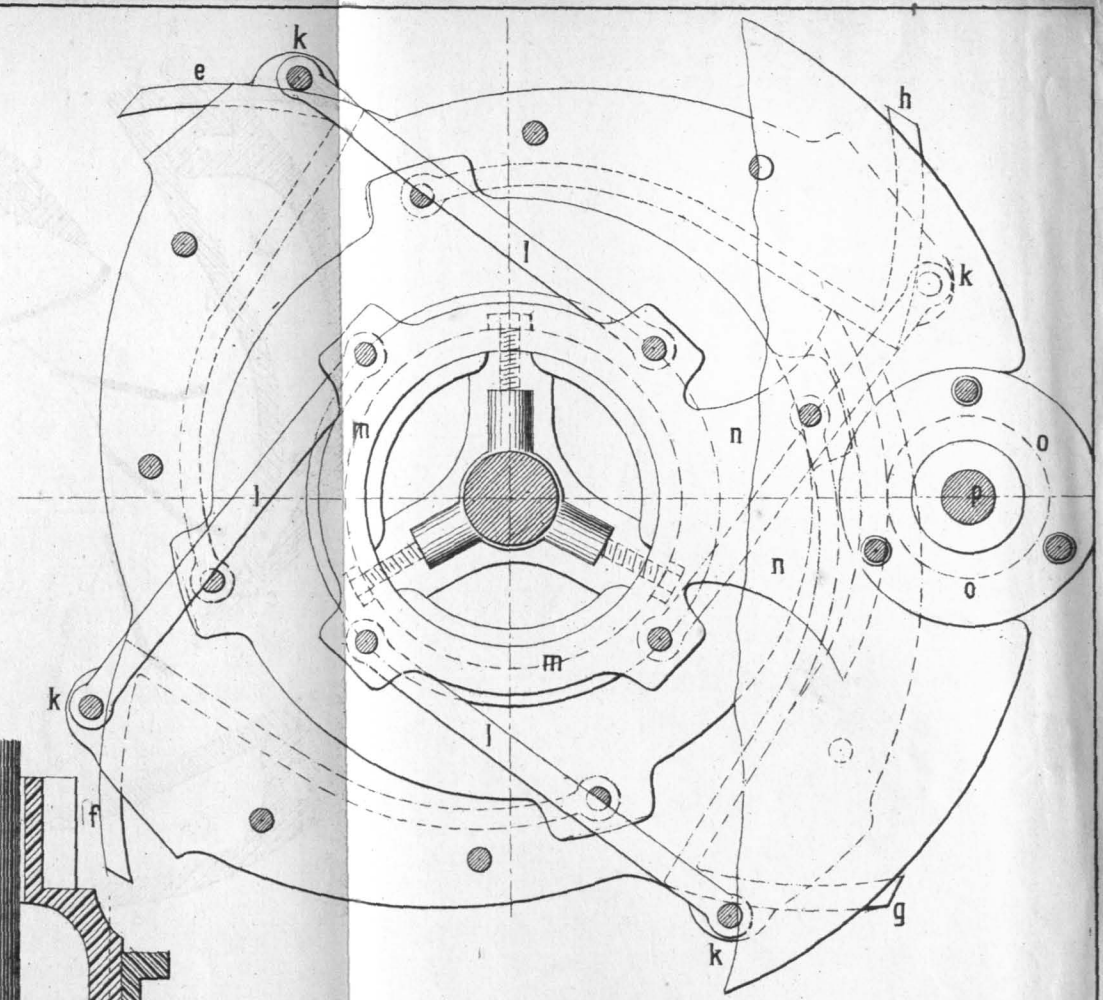


Fig. 2.

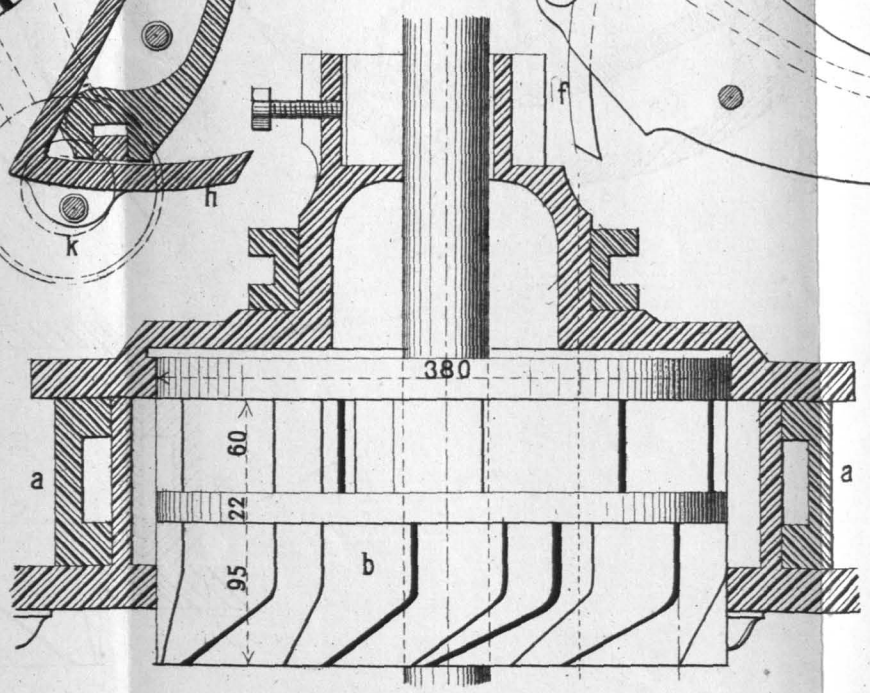
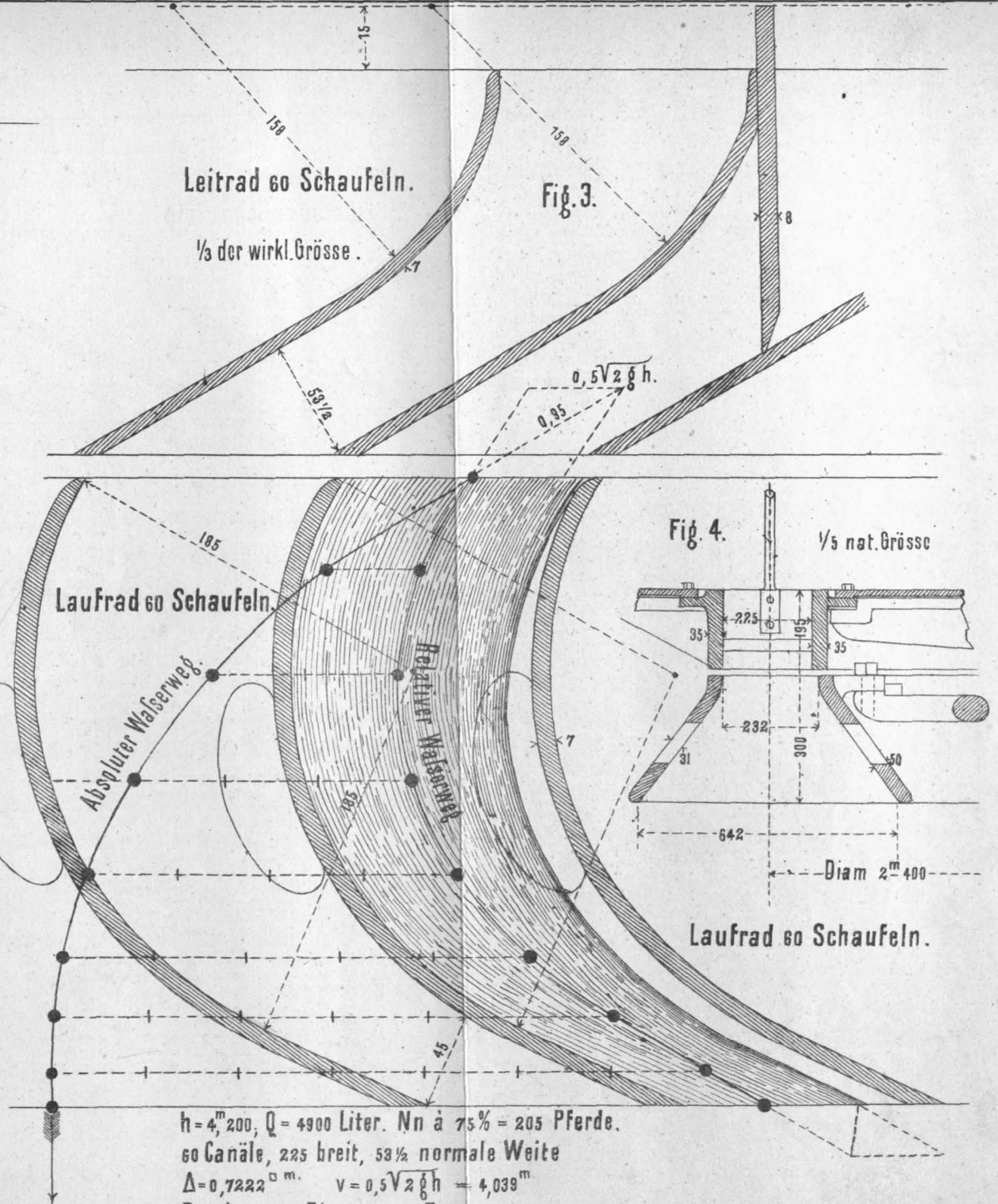
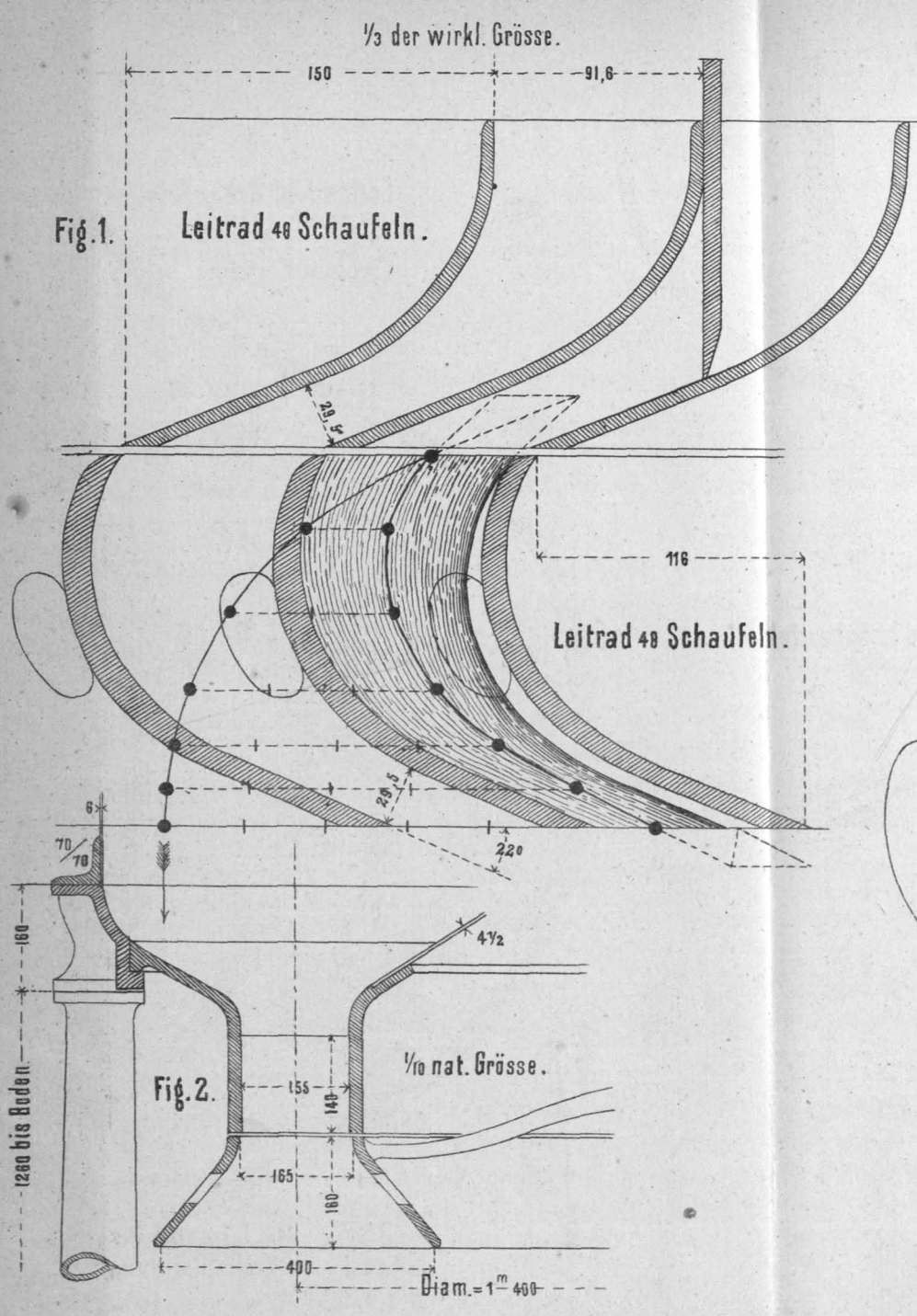
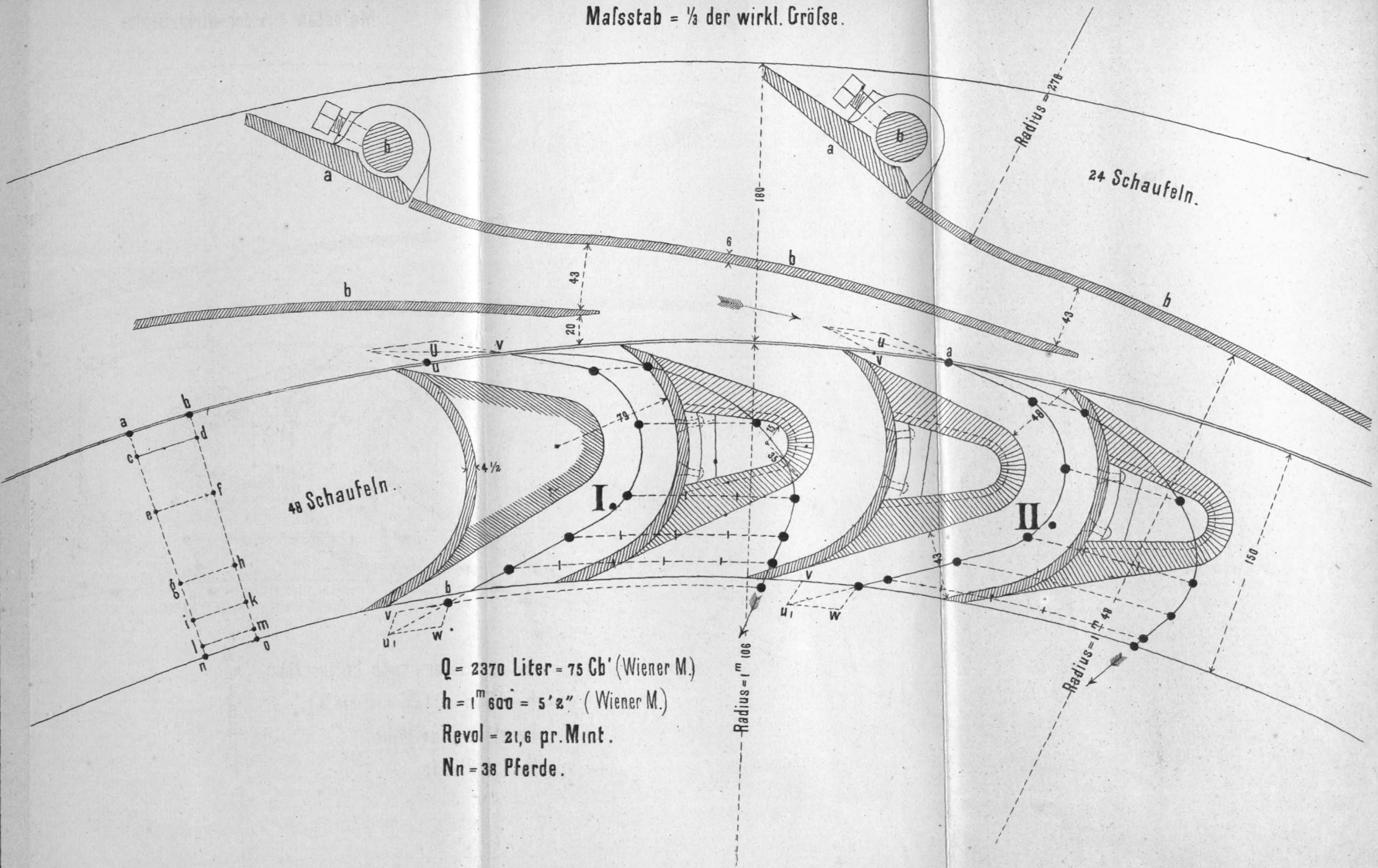


Fig. 3.



$h = 4^m 200$, $Q = 4900$ Liter. $N_n \text{ à } 75\% = 205$ Pferde.
 60 Canäle, 225 breit, 53 1/2 normale Weite
 $\Delta = 0,7222^m$. $v = 0,5\sqrt{2gh} = 4,039^m$
 Revol. = 32 Diam = 2,400^m.

Masstab = 1/3 der wirkl. Größe.



48 Schaufeln.

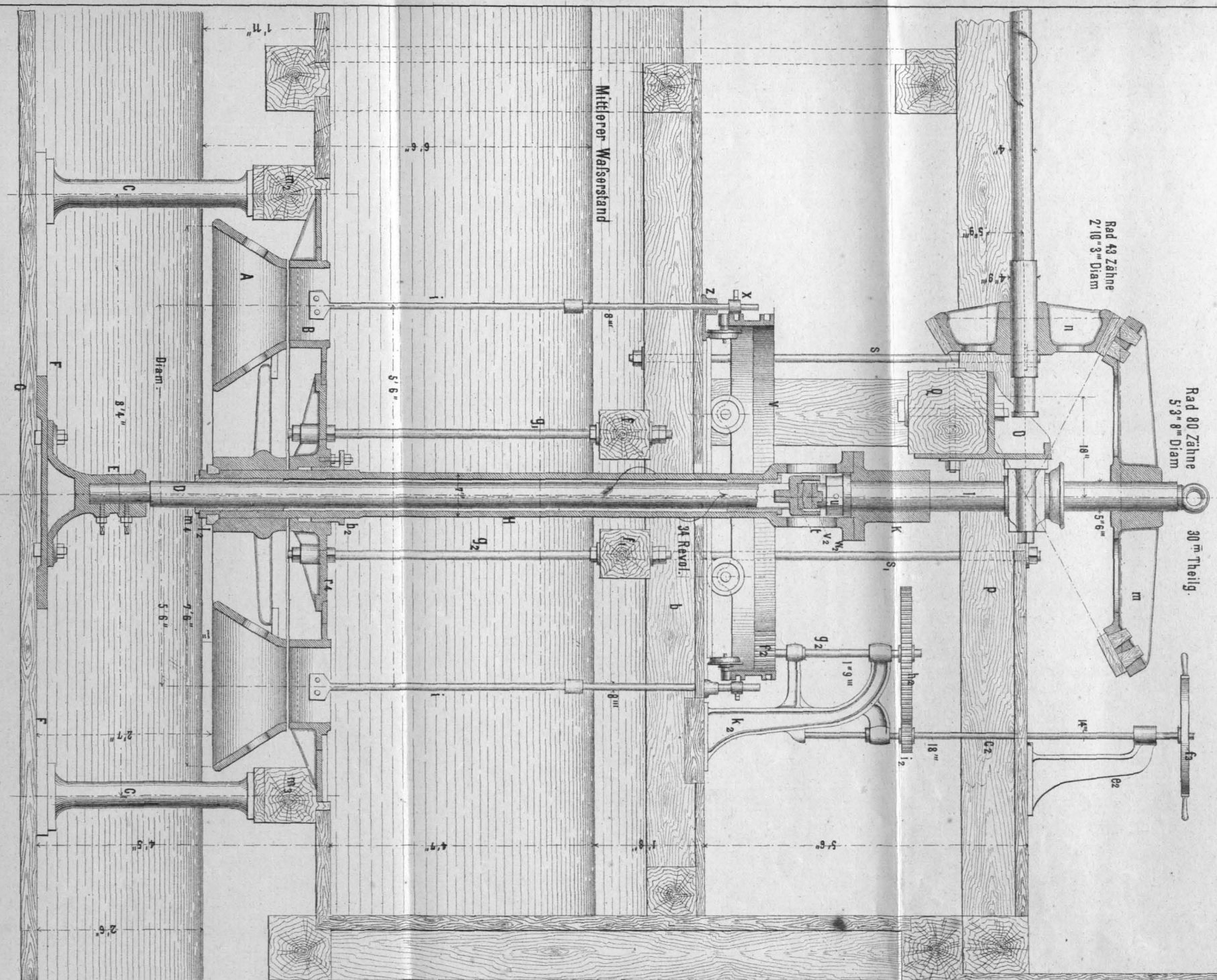
24 Schaufeln.

$Q = 2370 \text{ Liter} = 75 \text{ Cb}' \text{ (Wiener M.)}$
 $h = 1^m 600 = 5' 2'' \text{ (Wiener M.)}$
 Revol = 21,6 pr. Mint.
 Nn = 38 Pferde.

0-85 (P' Wiener-2,686-Cub.Meter.
H-6'6" " " -2,054 Meter.
Gewicht - 80 Centner - 4000 Kilo.

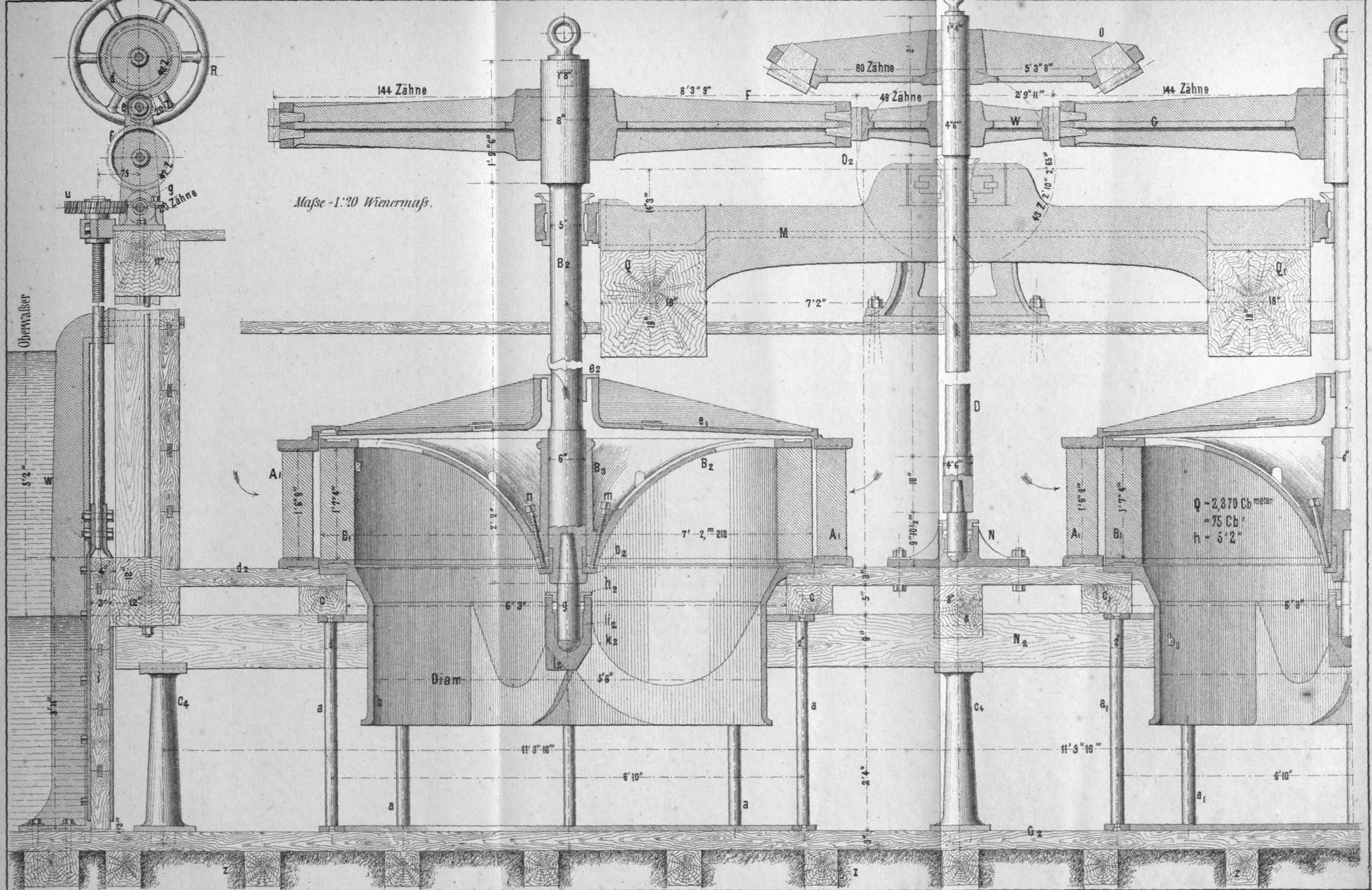
Vertical Schnitt.

Nun à 75% = 54 Pferde.
Revol - 34 pro Min.
Diam - 5'6" = 1,738



Messstab-1:29. Wienermßs (1 Wiener 3/16 mull)

Guard-Turbine von 54 Pferden in der Holzschleiferei des Herrn Spuro in Pöschschlä (Oesterreich.)
Installation von der Maschinenfabrik C.A. Spicker in Wien.



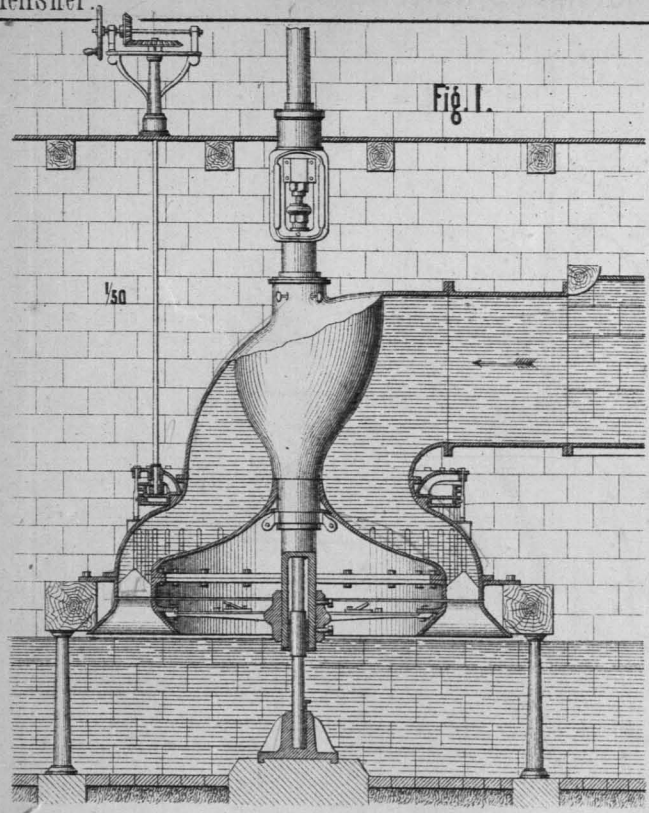


Fig. 1.

1/50

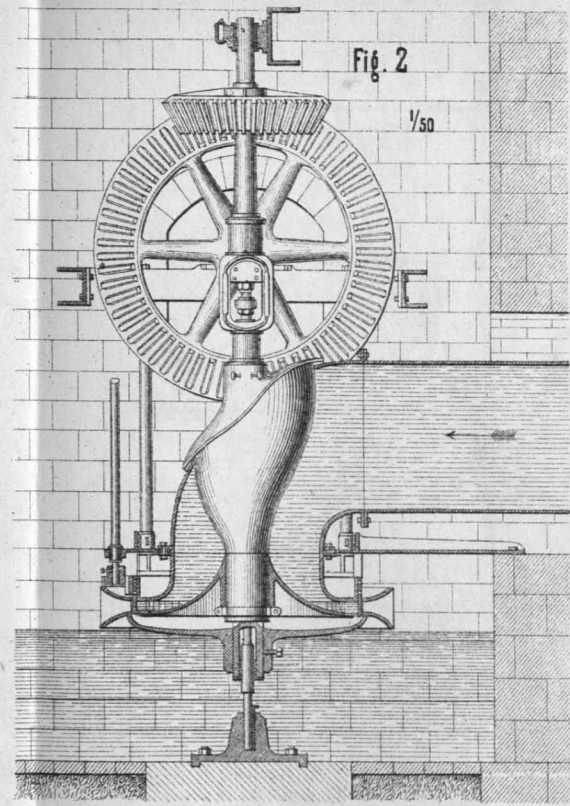


Fig. 2.

1/50

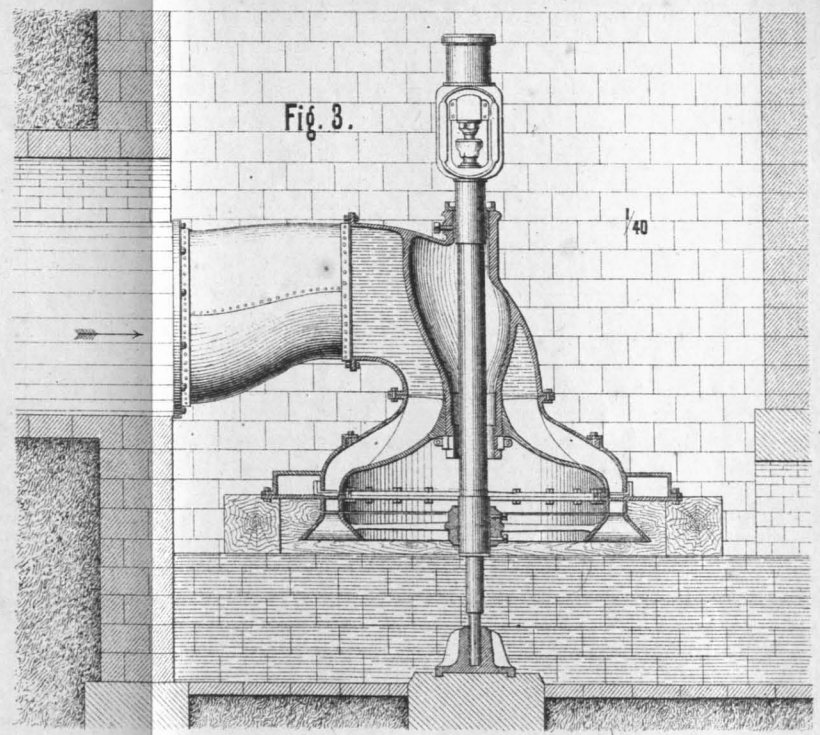


Fig. 3.

1/40

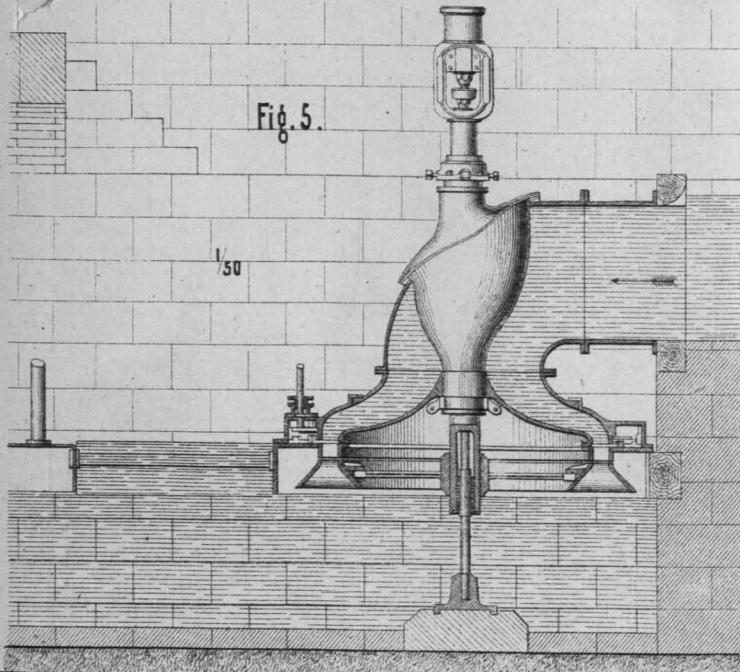


Fig. 5.

1/50

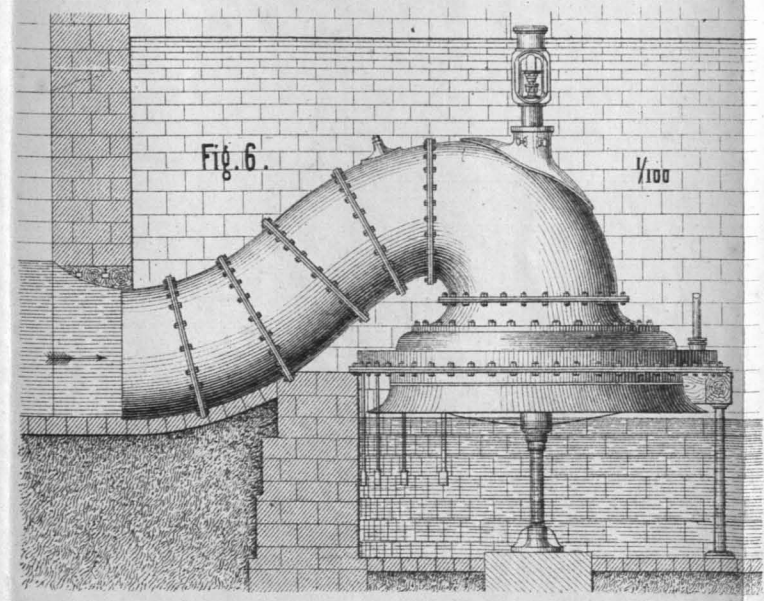


Fig. 6.

1/100

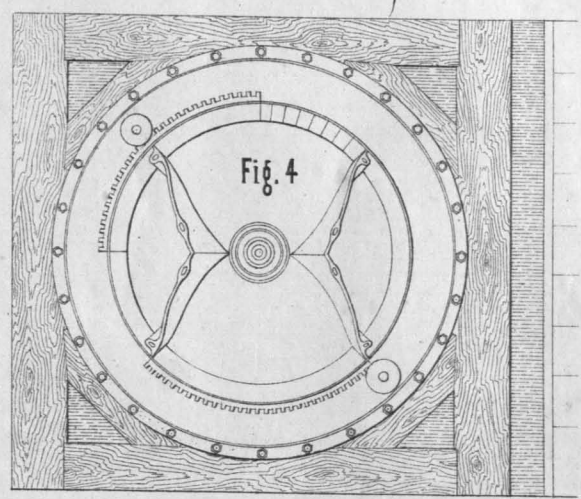


Fig. 4.

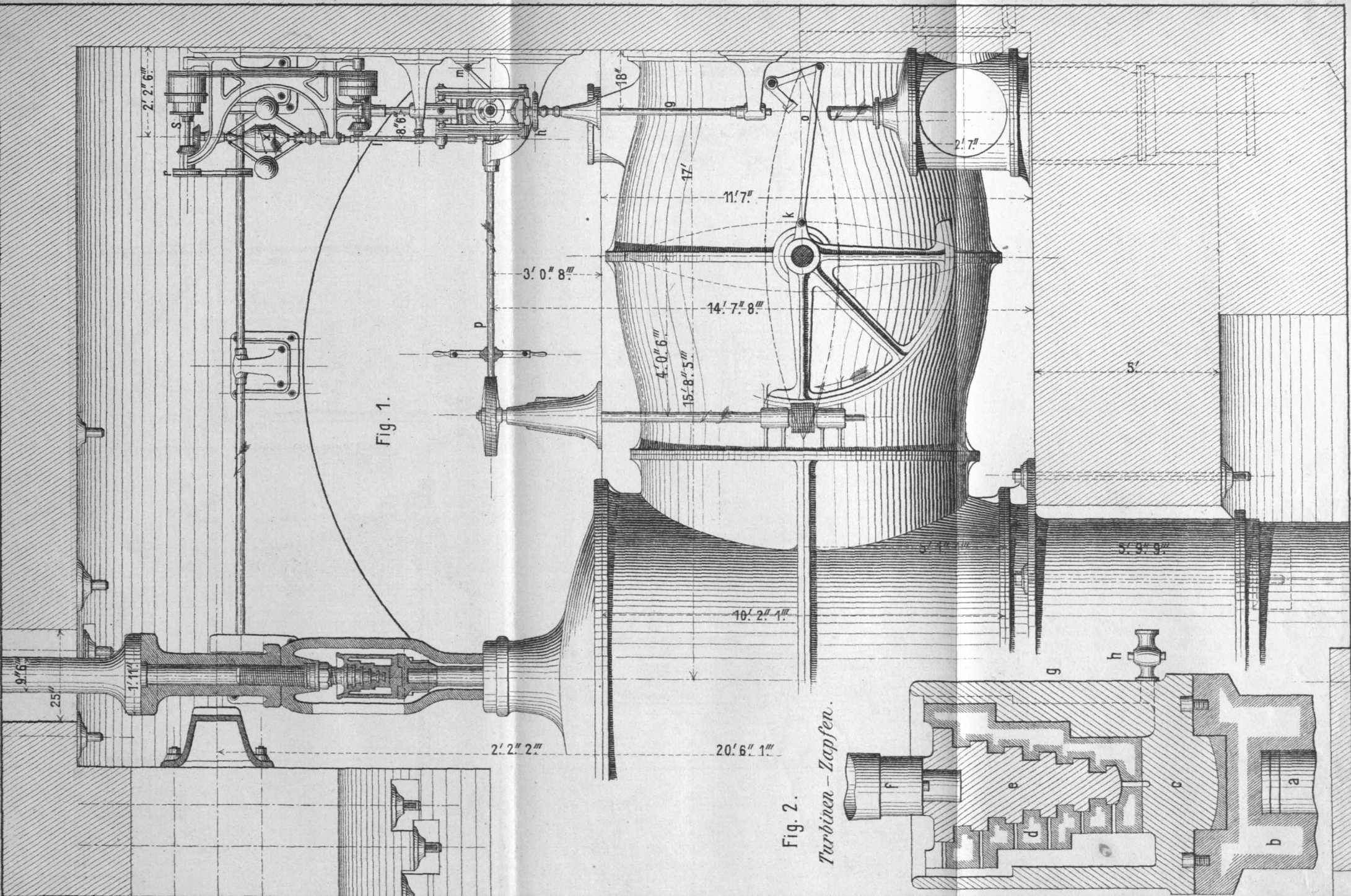


Fig. 1.

Fig. 2.
Turbinen - Zapfen.

Diam. 1200

Daten.
 Gefälle 8,080^m.
 Q 0,47 bis 1,109 l^bm³.
 Nutzleistung 35 Pferde
 bis 90 "

100

125

192

270

Fig. 1.

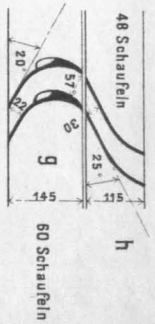


Fig. 3.

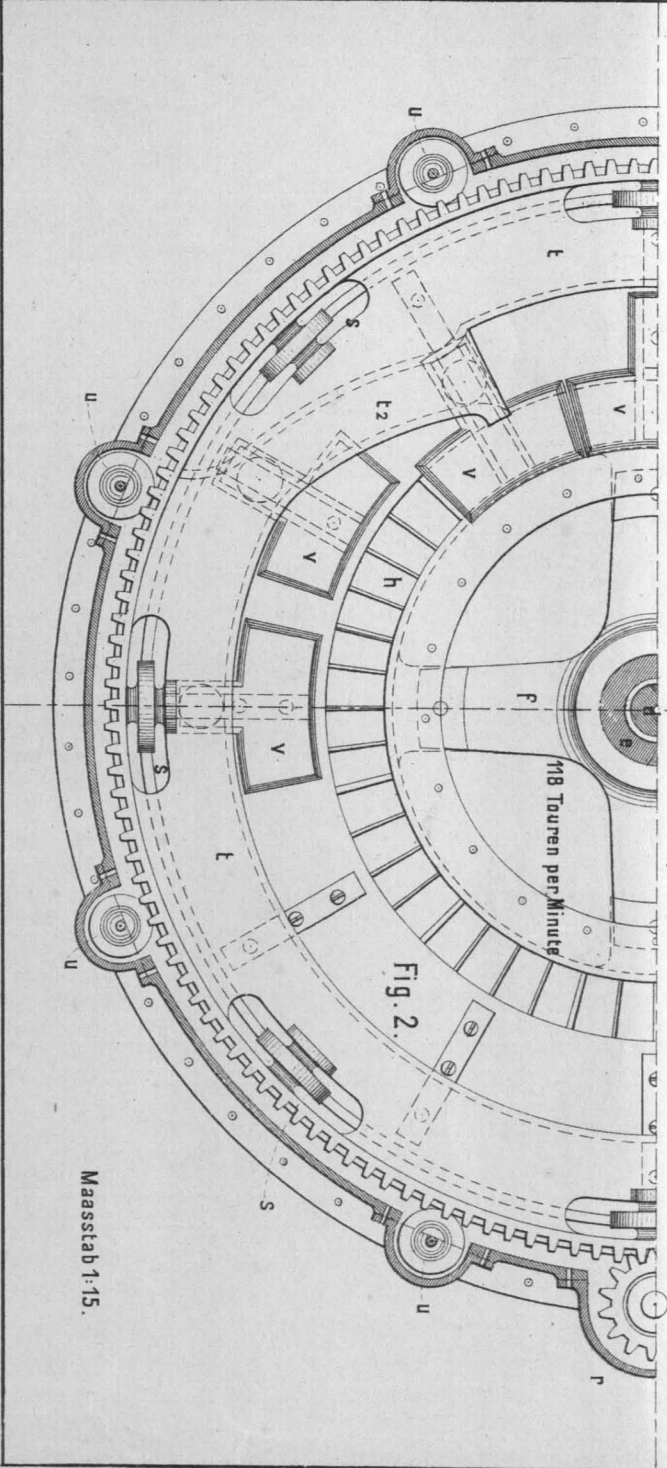
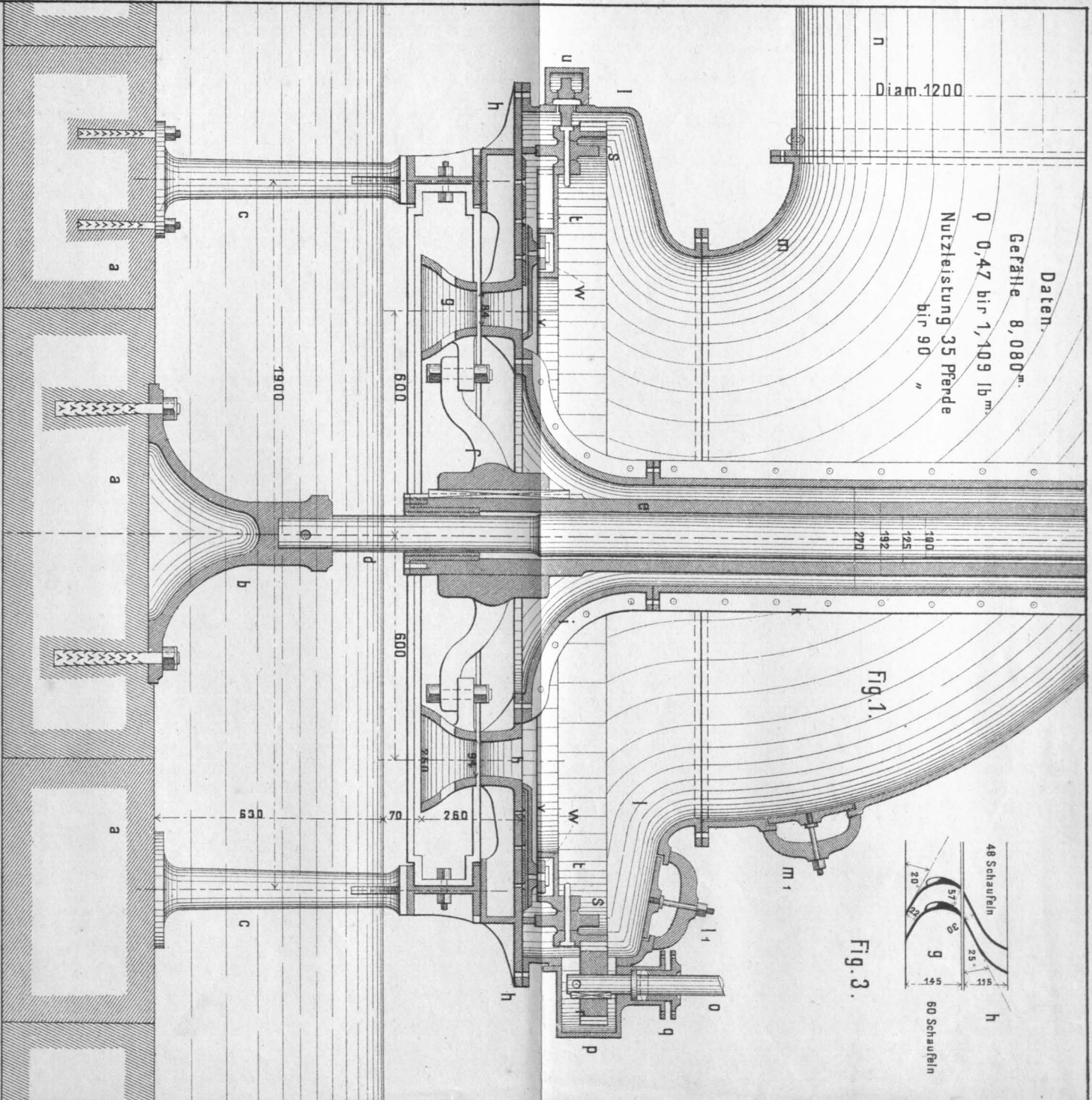
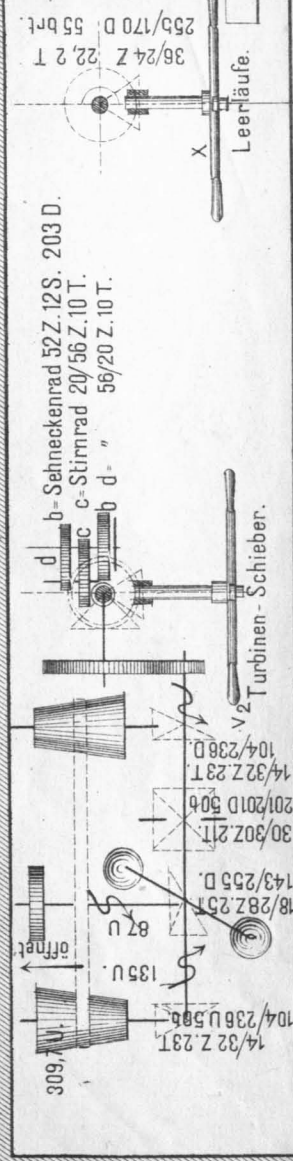
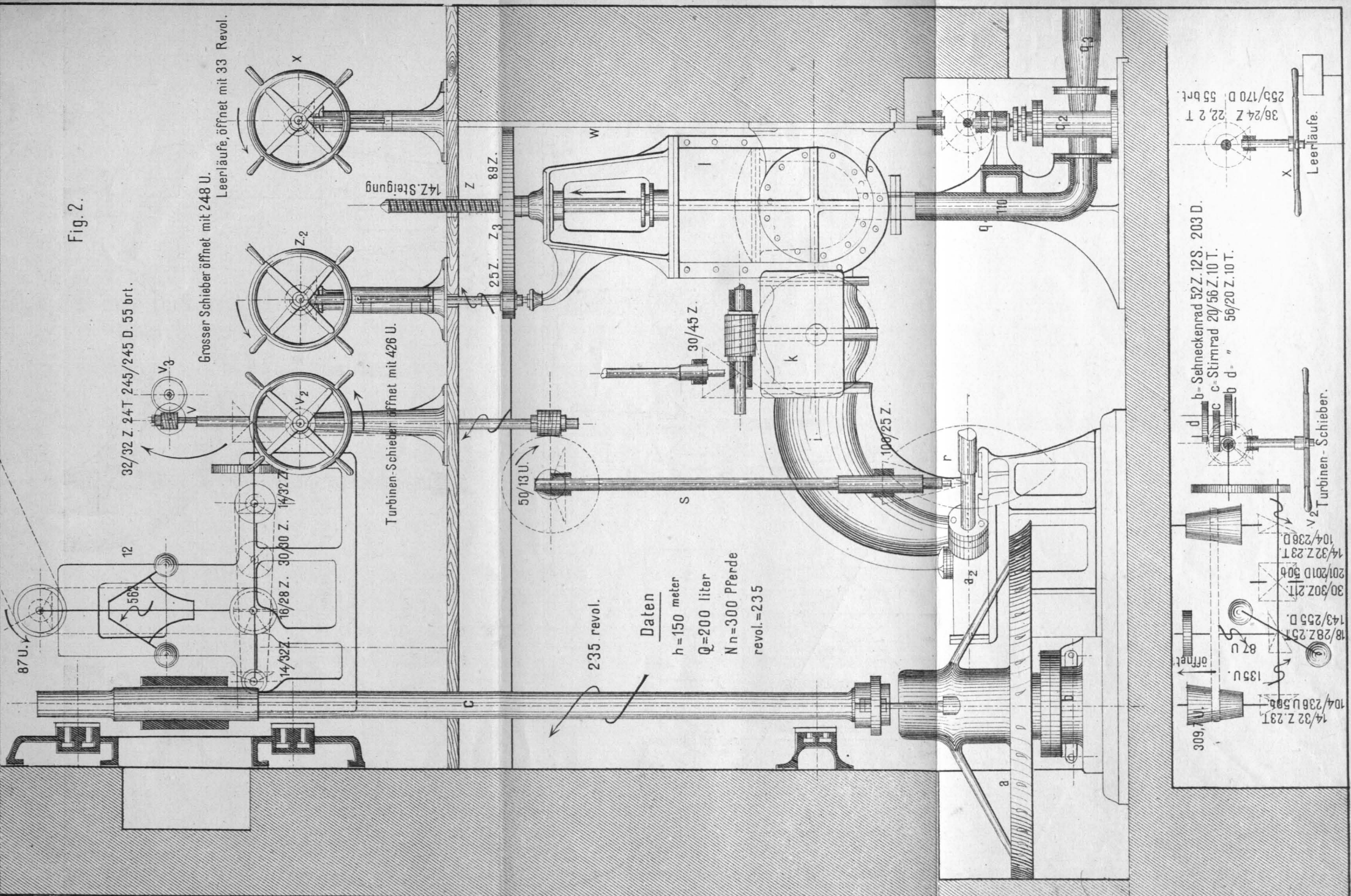


Fig. 2.

Maasstab 1:15.

*Girard-Turbine mit horizontaler Schieber-Regulierung;
 für die Spinnerei u. Weberei der H^m-Gehärdter Becker in Lütthal, Glams, Schweiz.
 Installation d. H^m-Eglt u. Huber Maschinenfabrik in Tarn bei Rätti, Schweiz.*

Fig. 2.



Hermann Costenoble Verlagsbuchhandlung in Jena.

300 pferdige Girardturbine für 150 meter Gefälle in der Weberei in Mels des H^{rn} Joh. Heer in Glarus.
 Installation von Theodor Bell & Cie Kriens. (Schweiz.)
 Installation von Theodor Bell & Cie in Kriens. (Schweiz.)

Lith. Anst. v. J.G. Fritzsche, Leipzig.

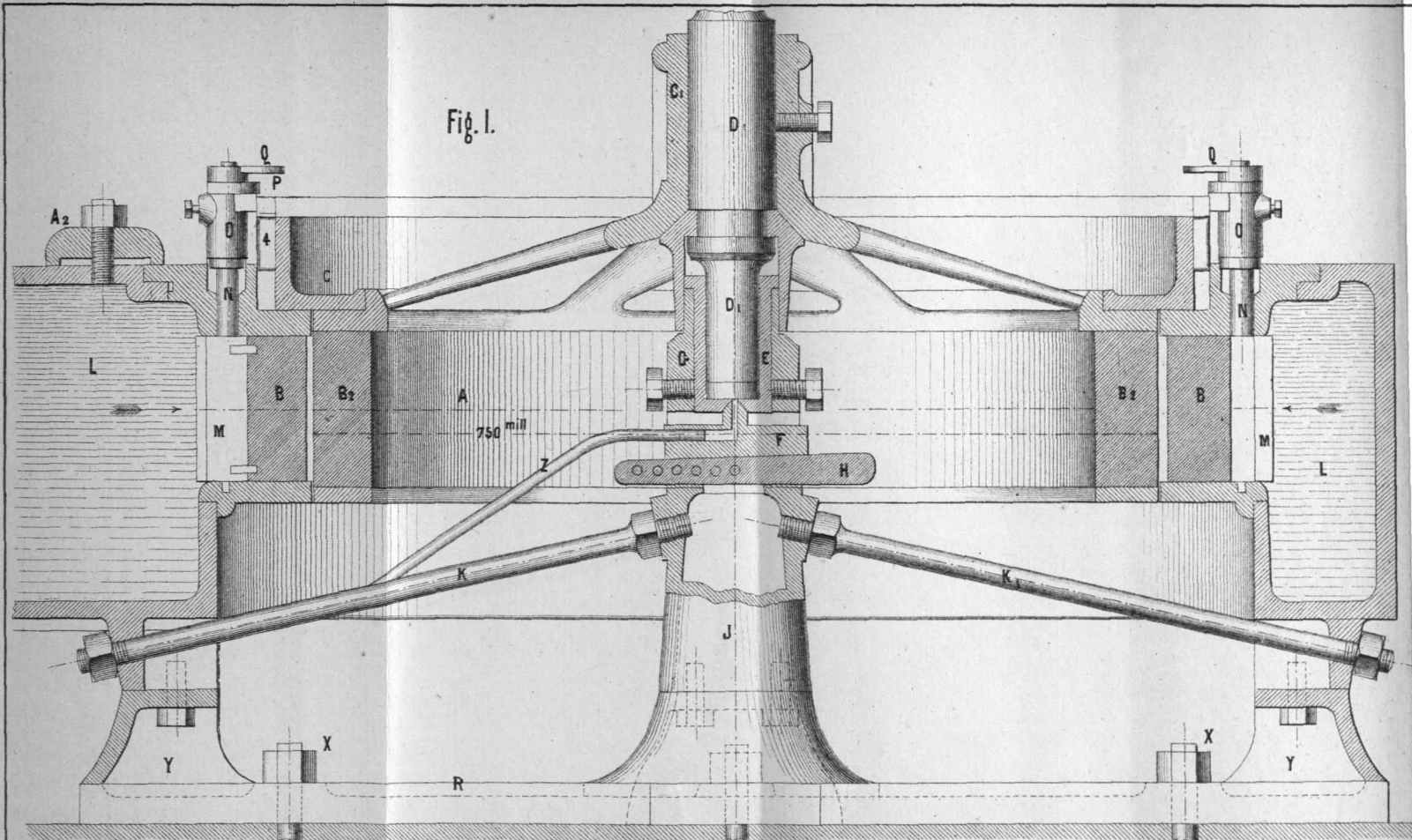


Fig. 1.

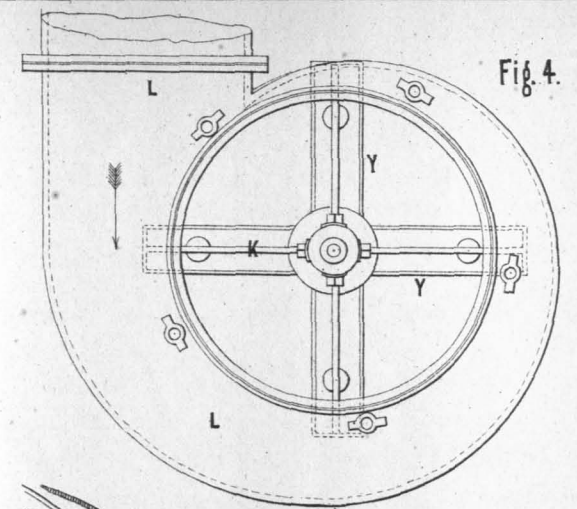


Fig. 4.

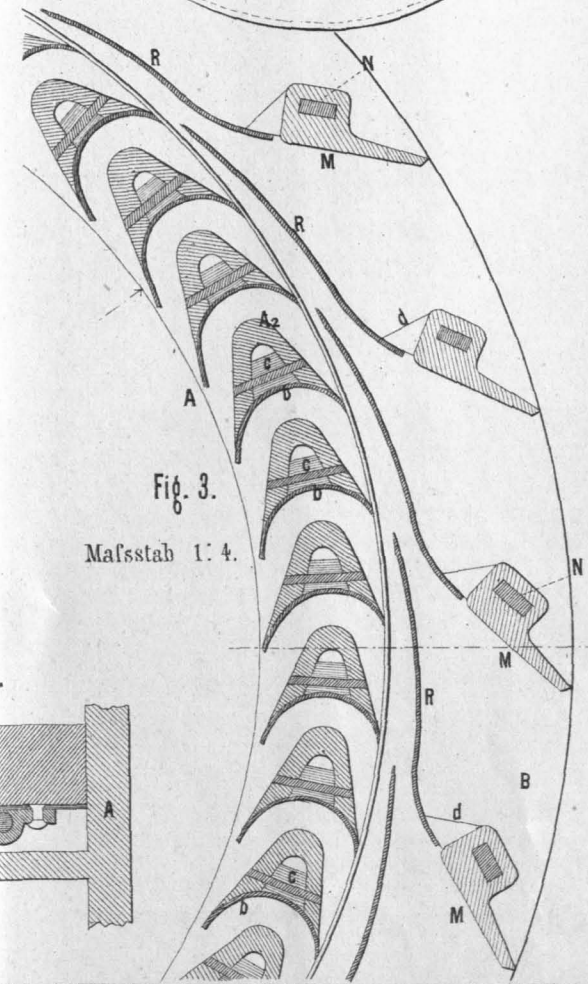


Fig. 3.

Mafsstab 1: 4.

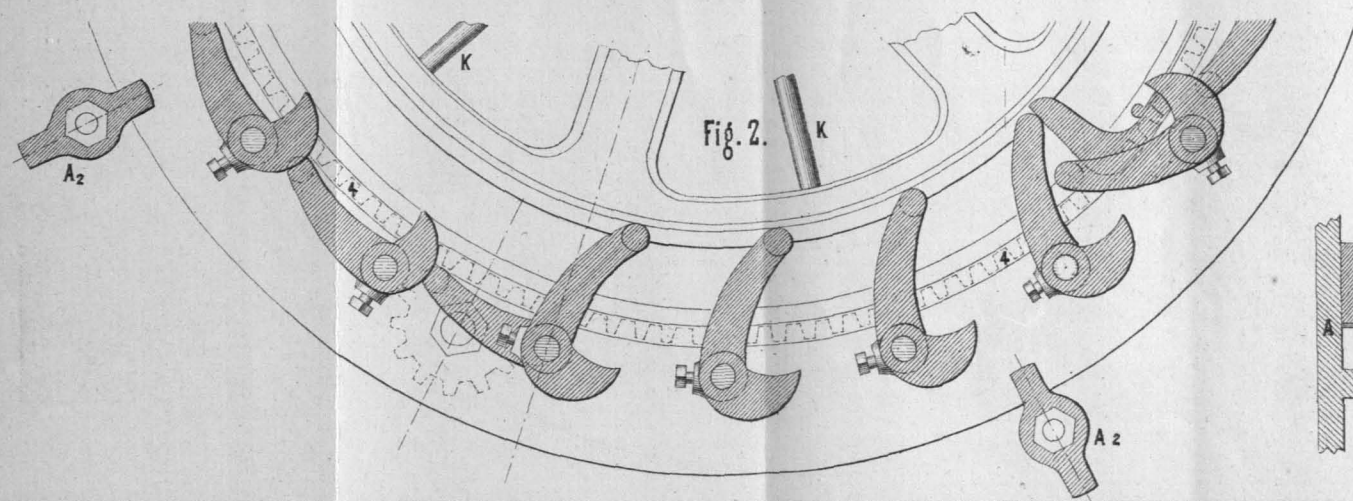


Fig. 2.

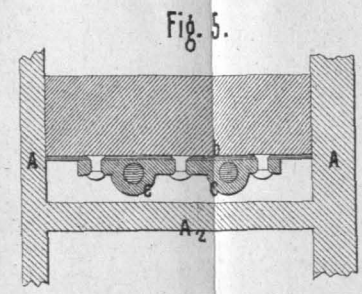


Fig. 5.

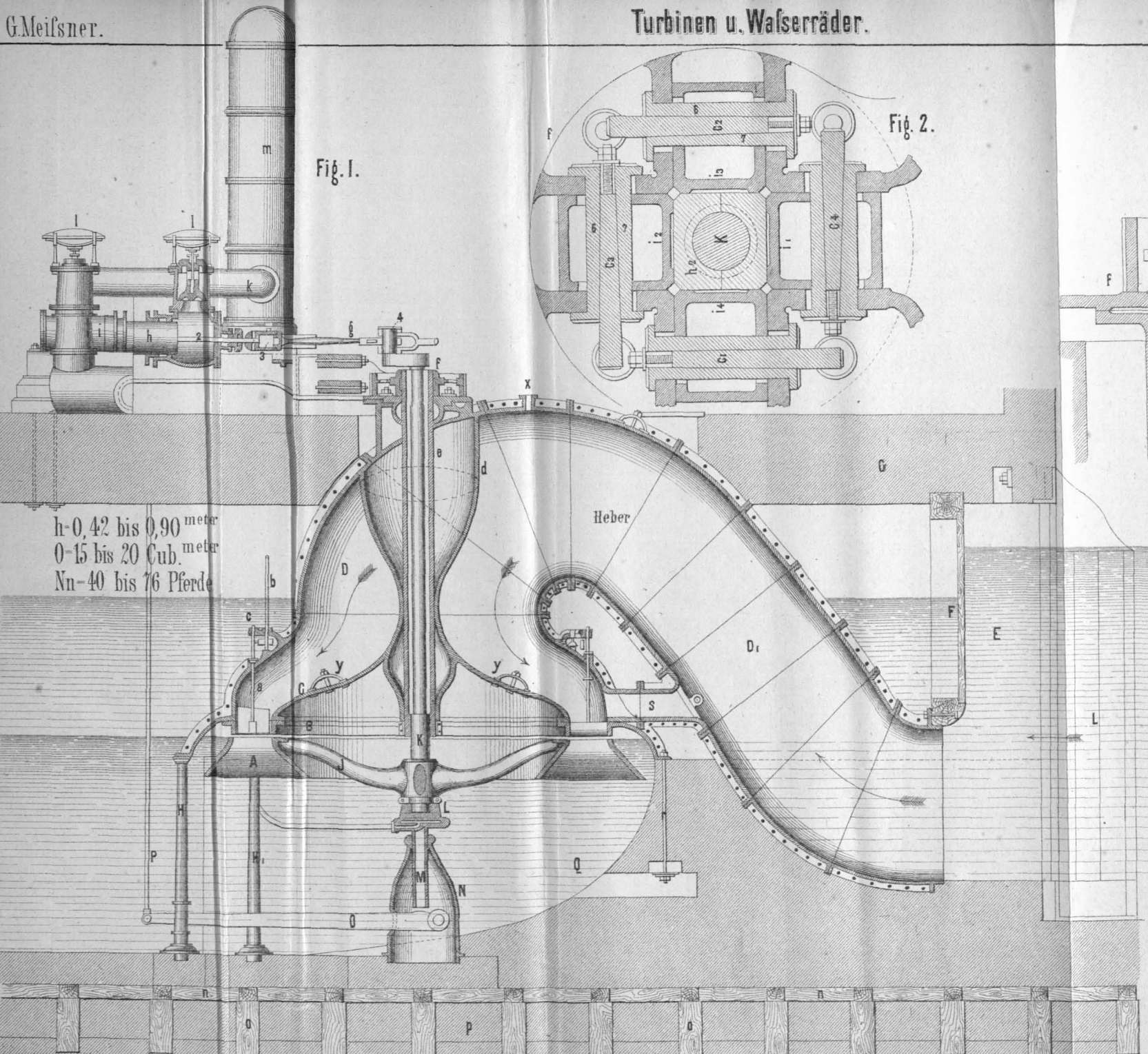


Fig. 1.

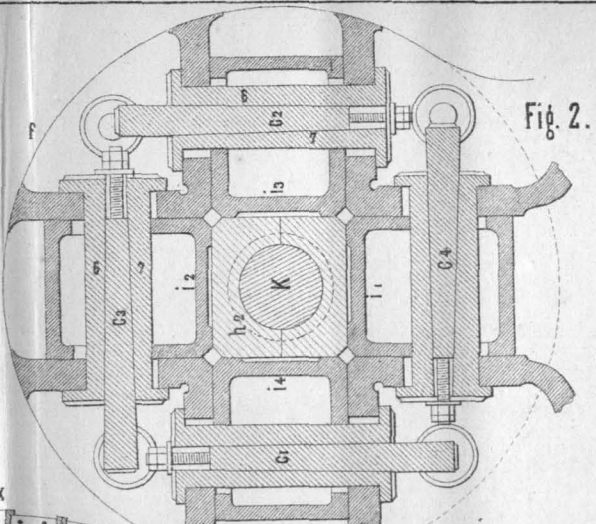


Fig. 2.

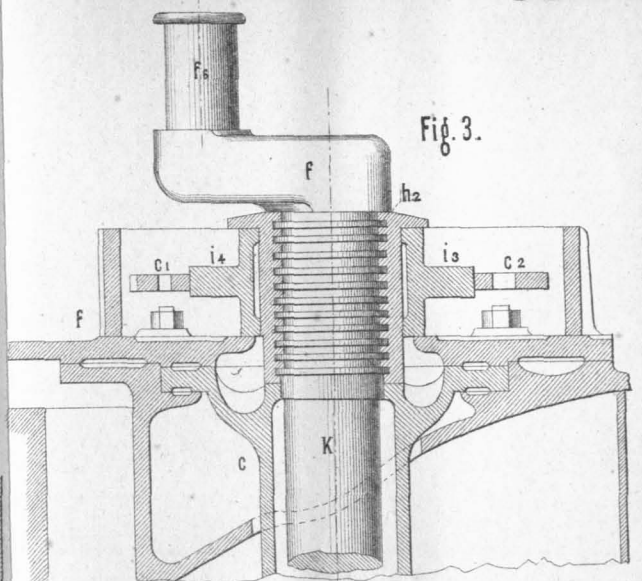


Fig. 3.

h-0,42 bis 0,90 meter
 0-15 bis 20 Cub. meter
 Nu-40 bis 76 Pferde

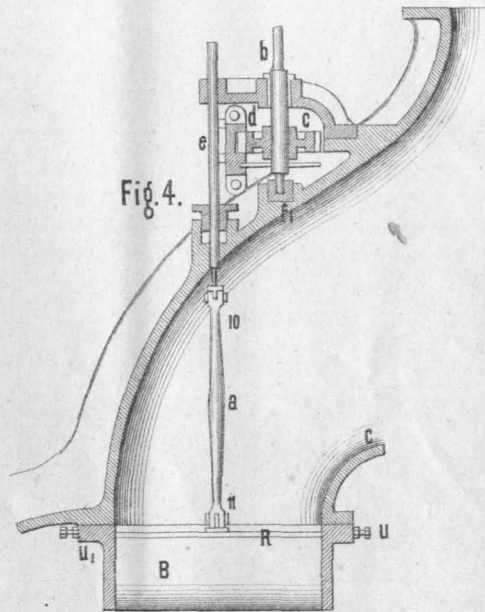


Fig. 4.

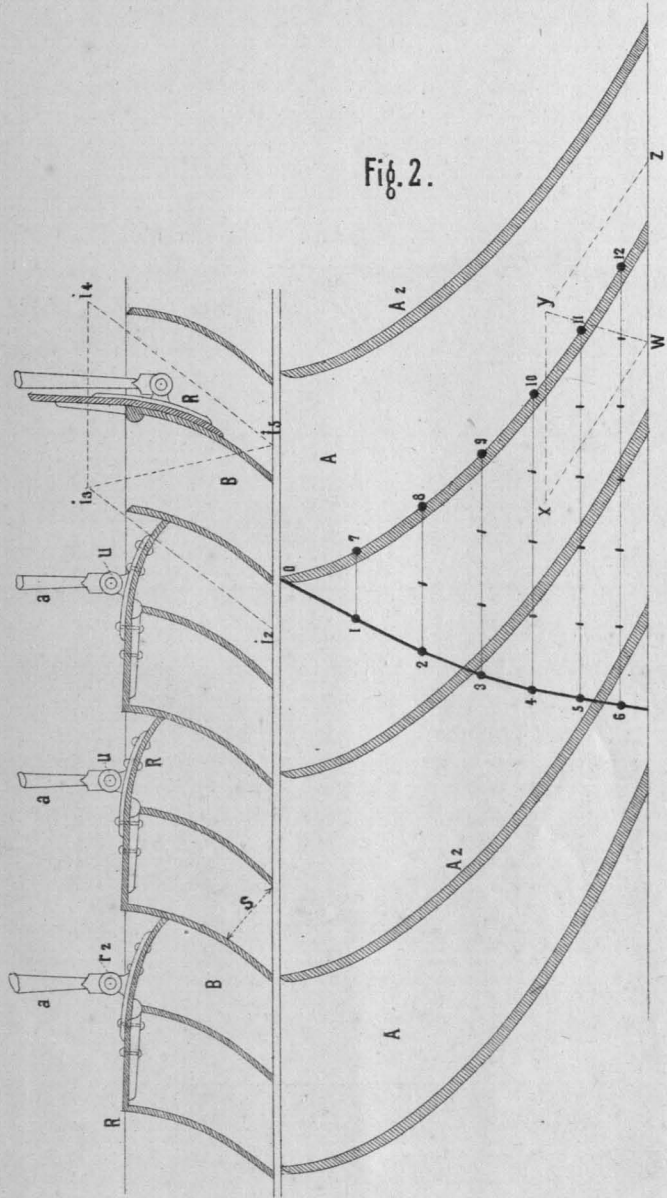


Fig. 2.

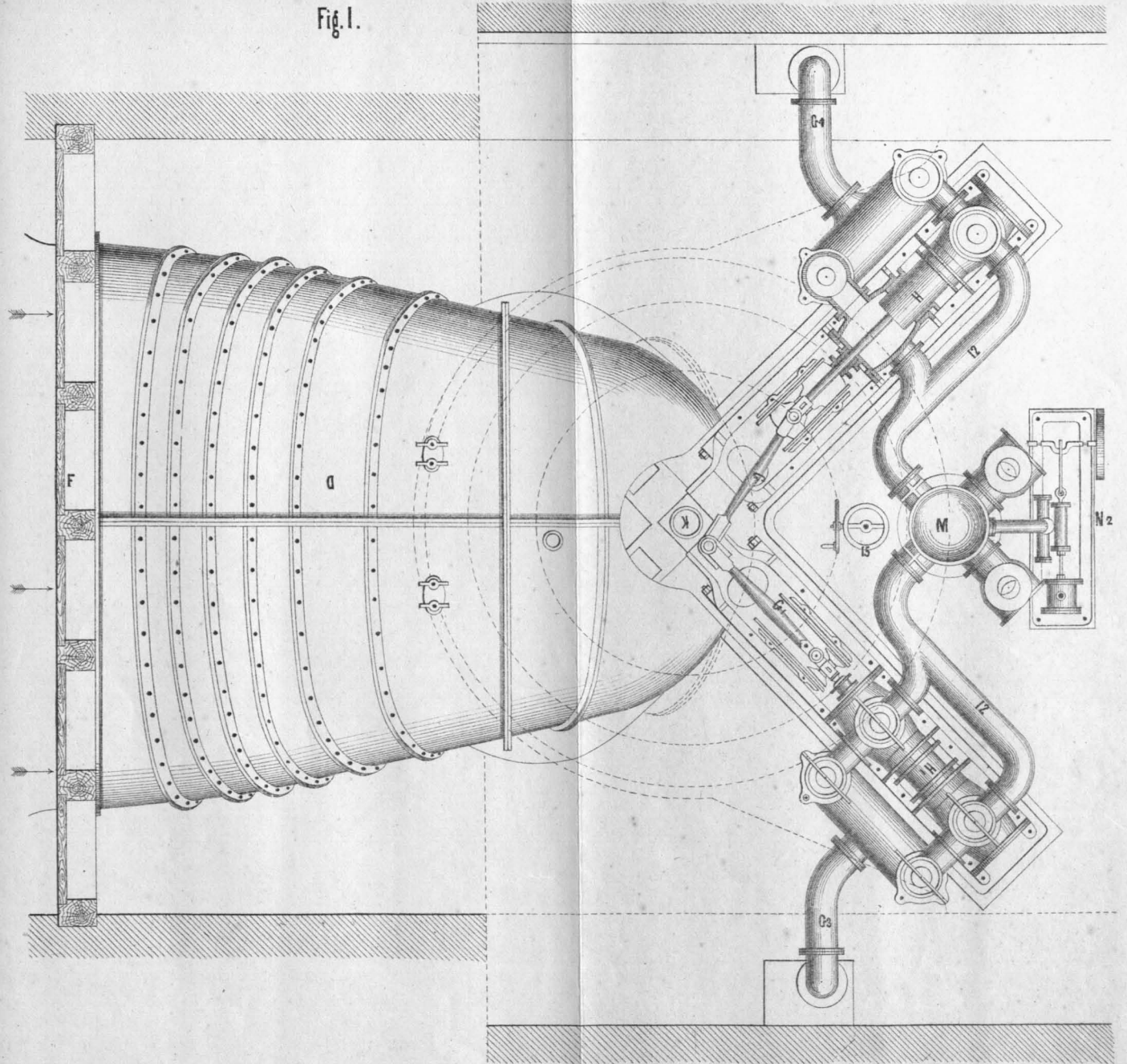


Fig. 1.

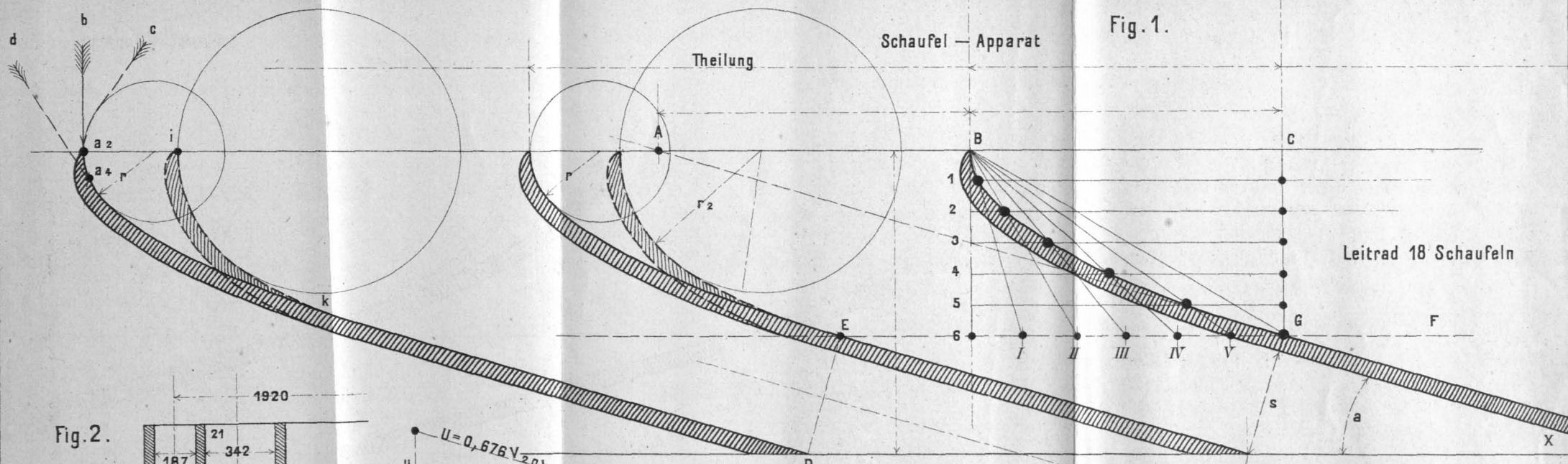


Fig. 1.

Fig. 2.

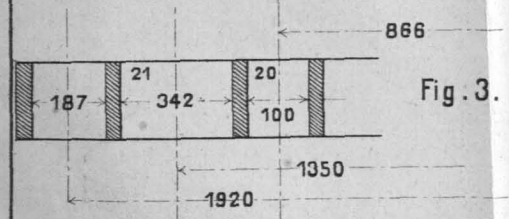
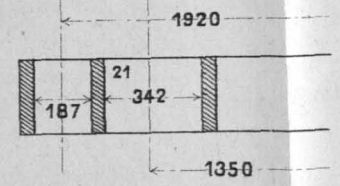
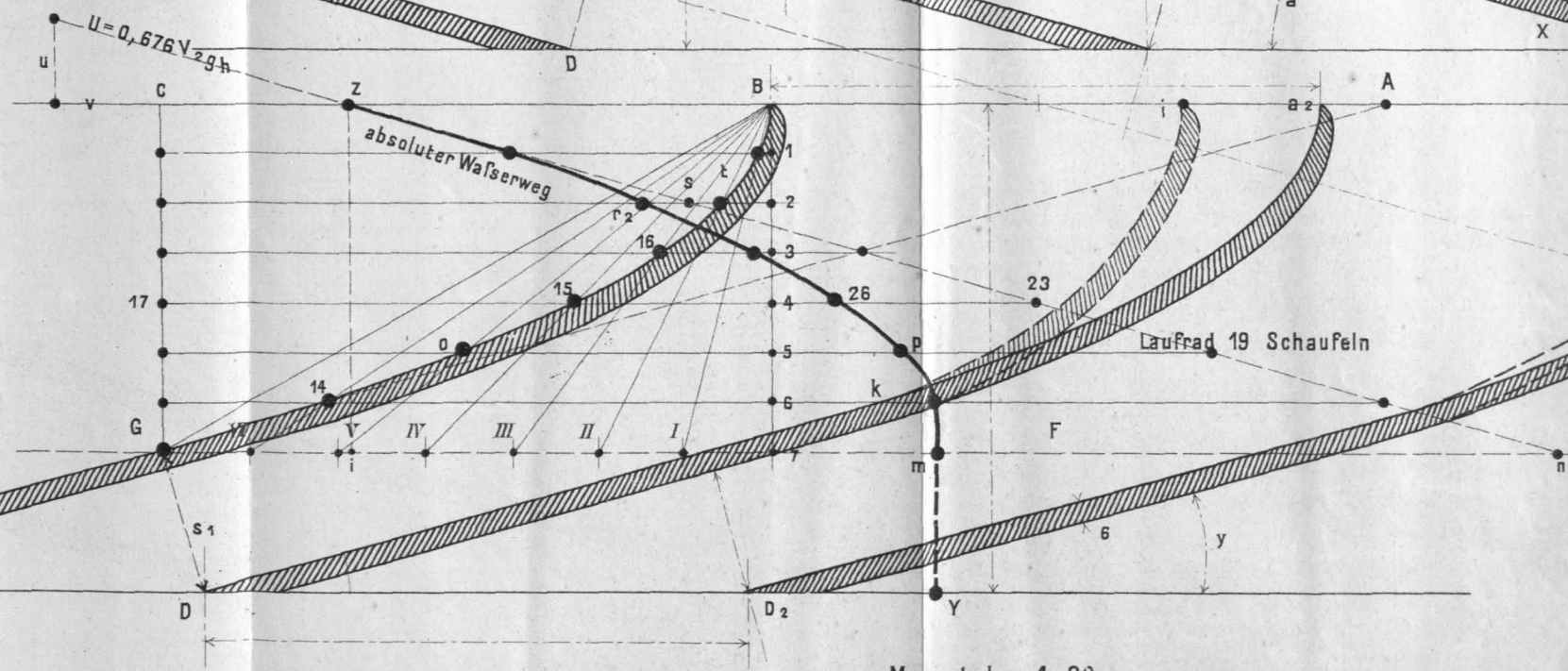
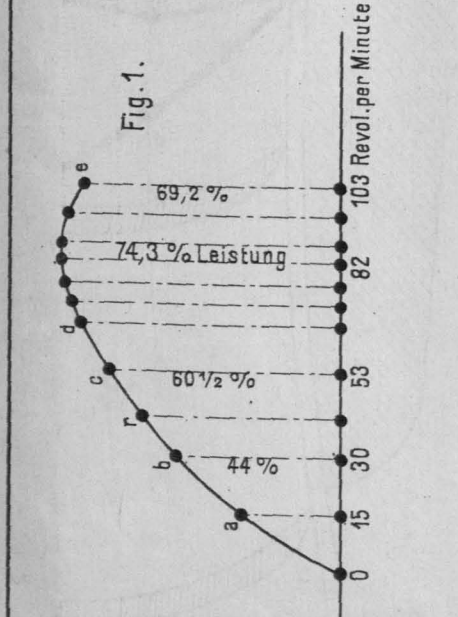
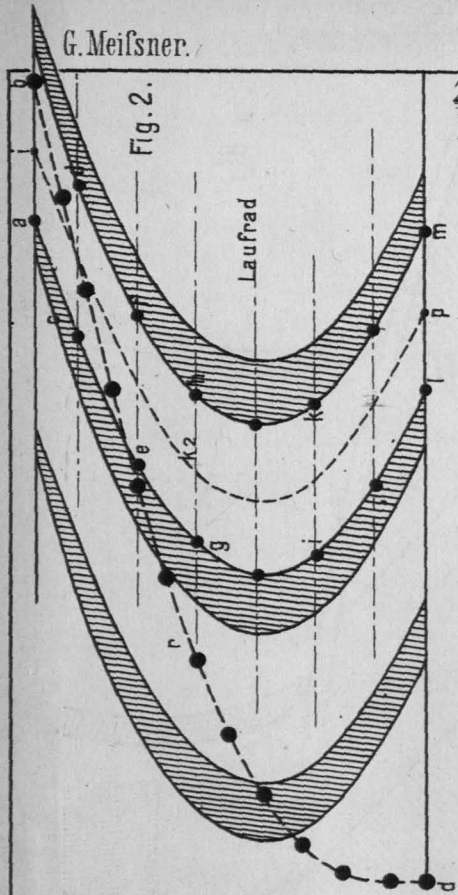


Fig. 3.



Maasstab — 1:20.



Wirkliche Größe

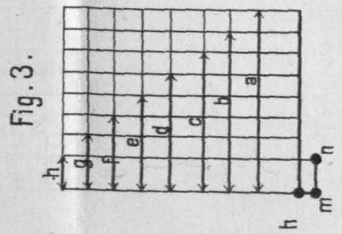


Fig. 3.

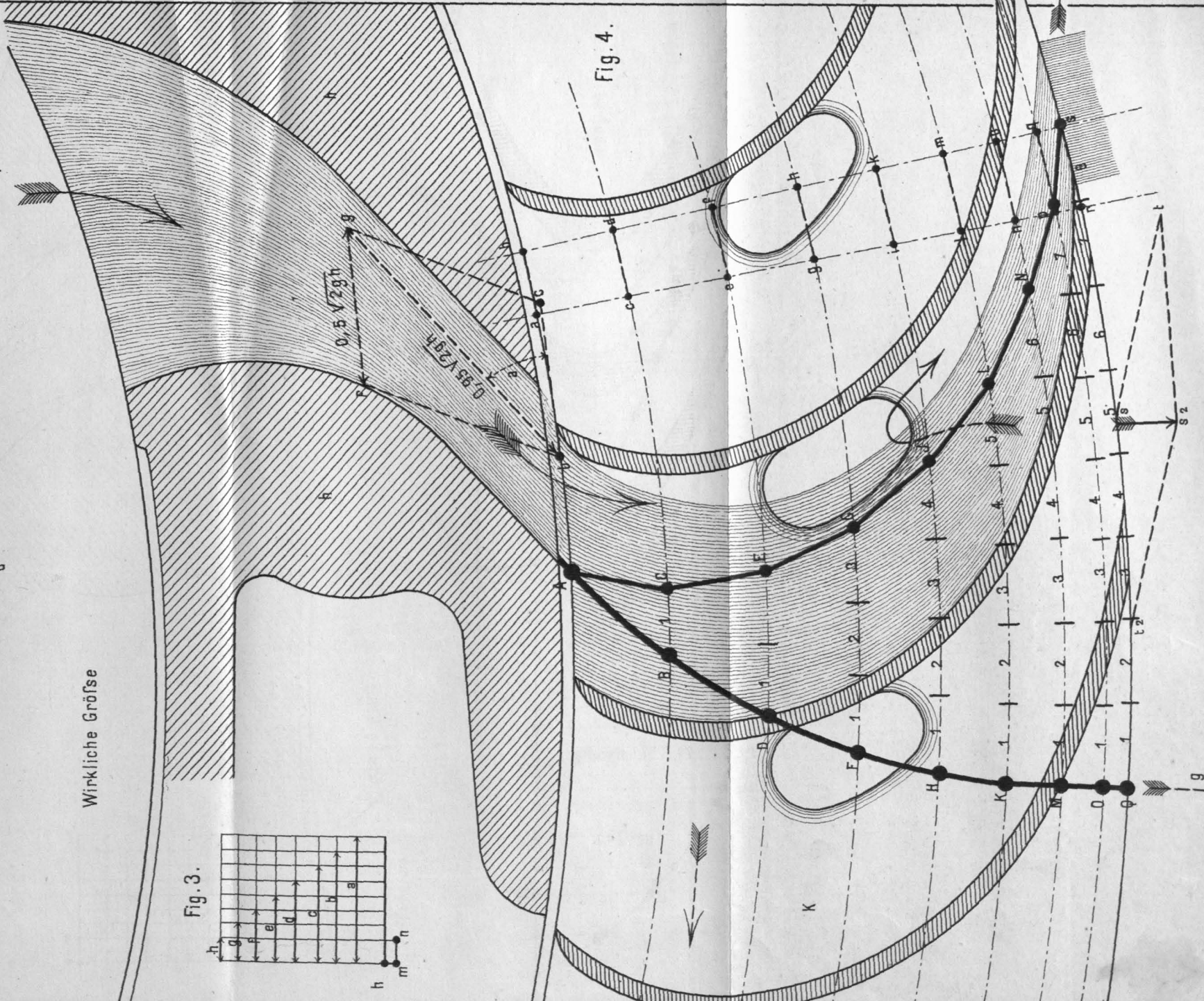
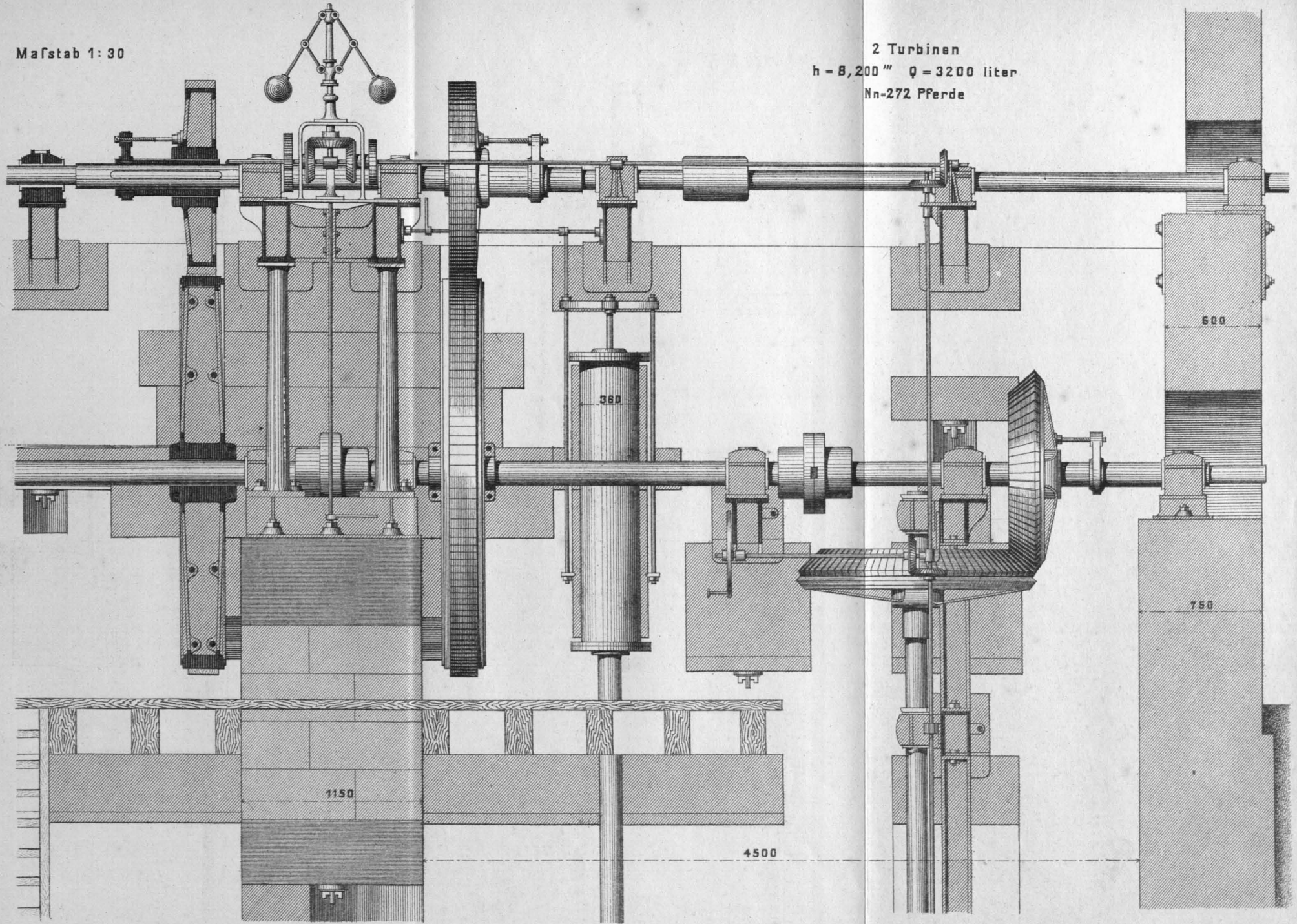


Fig. 4.

Maßstab 1:30

2 Turbinen
h = 8,200 m Q = 3200 liter
Nn = 272 Pferde





2 Turbinen
 8,200 m h
 3200 liter Q
 272 Pferde

Mafstab 1:30

Girard — Turbine

Fig. 1.

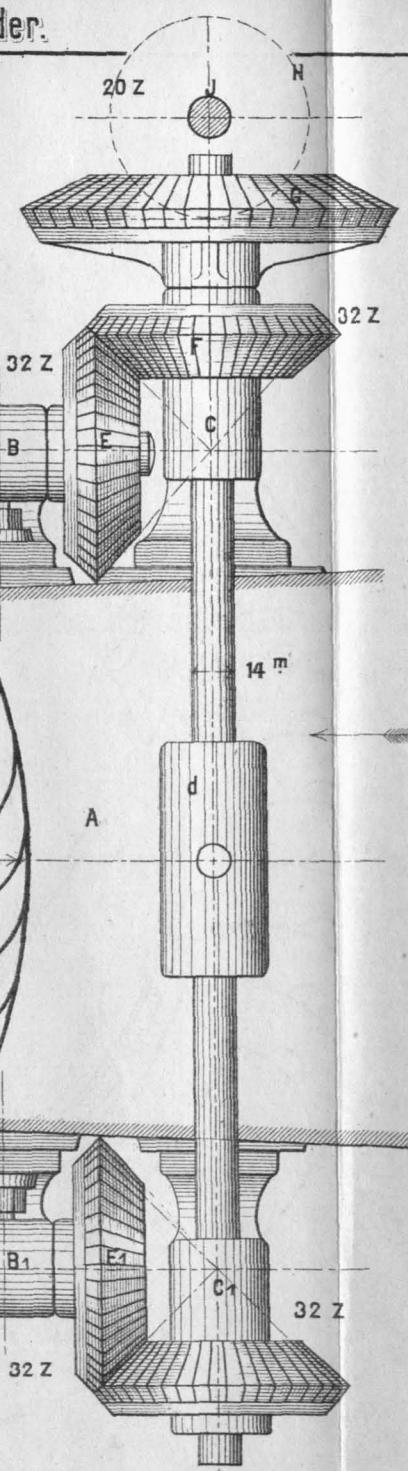
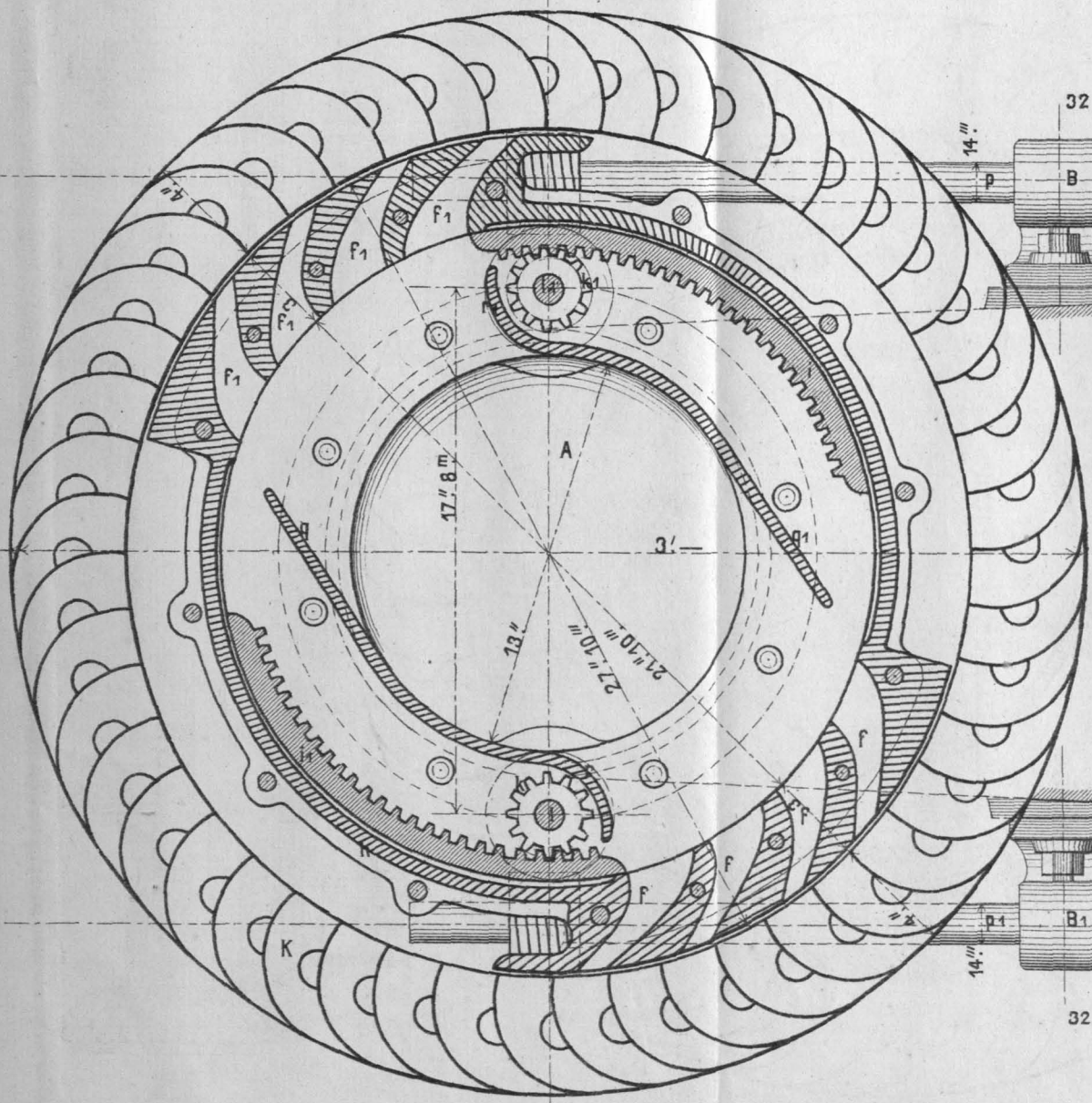


Fig. 2.

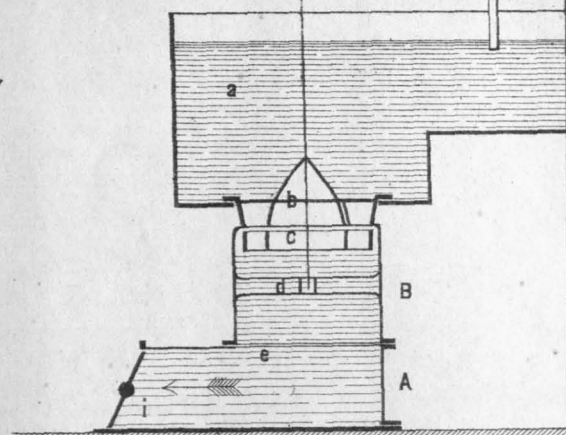


Fig. 3.

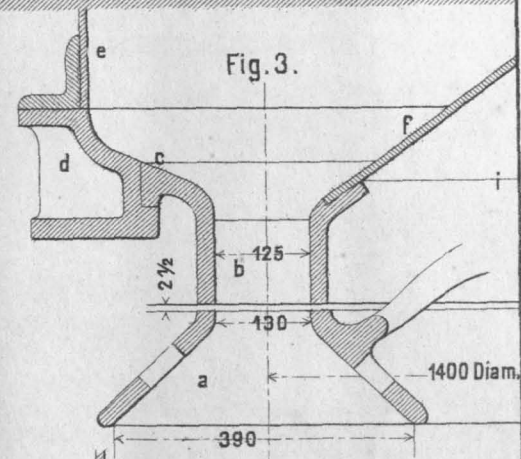
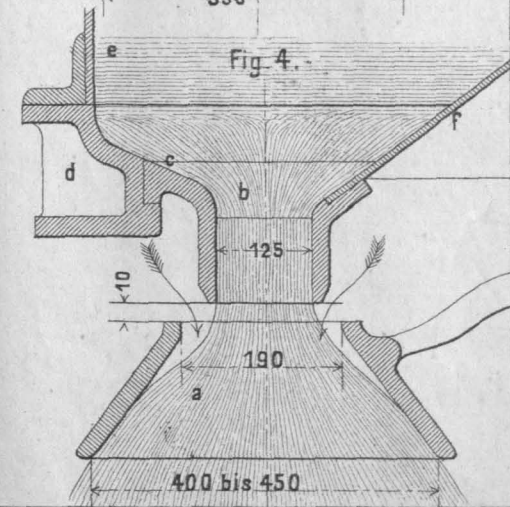
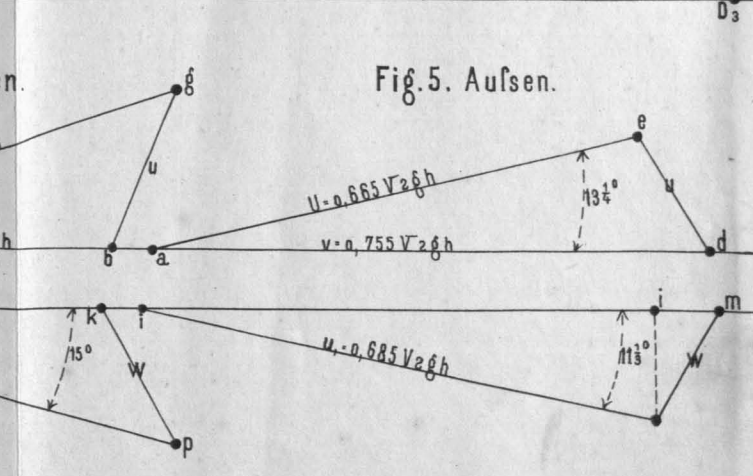
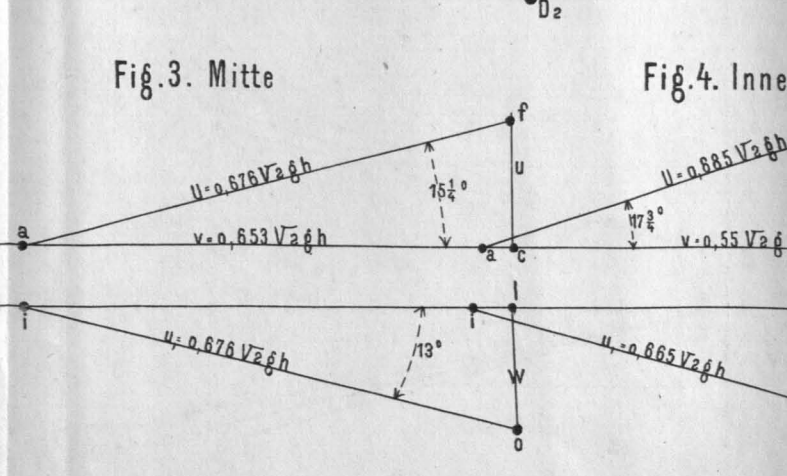
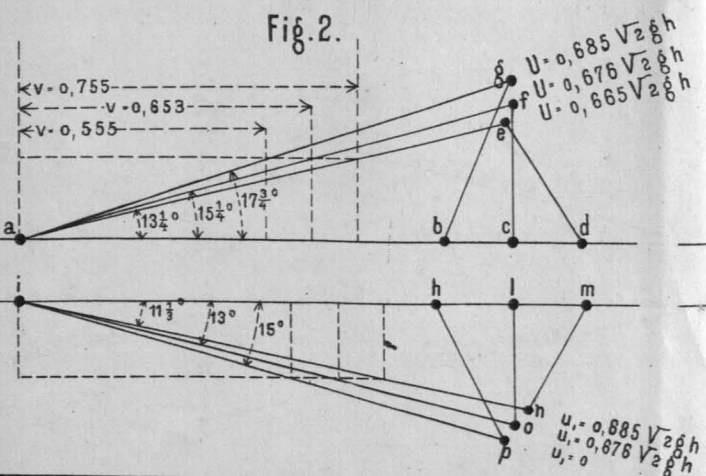
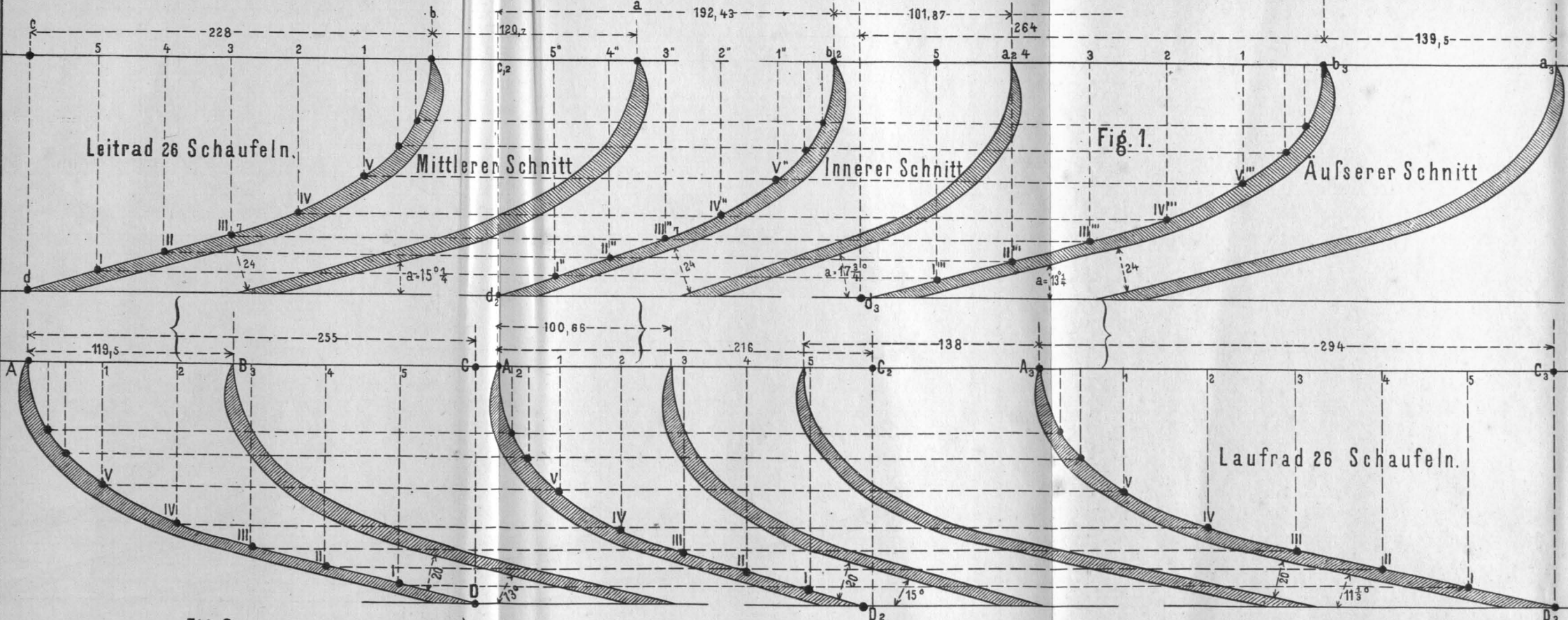


Fig. 4.



Daten. $Q = 800$ Liter. $h = 9000^m$ $Nu = \text{à } 75\% = 72$ Pferde. Anzahl Umdrehungen = 166. $\Delta = 0,0891^m$ meter.



Die Differenzen in den Ueberdruck- u. Winkelverhältnissen der Jonval Turbinen.

Fig. 1.

v ist gegeben.

Fig. 2.

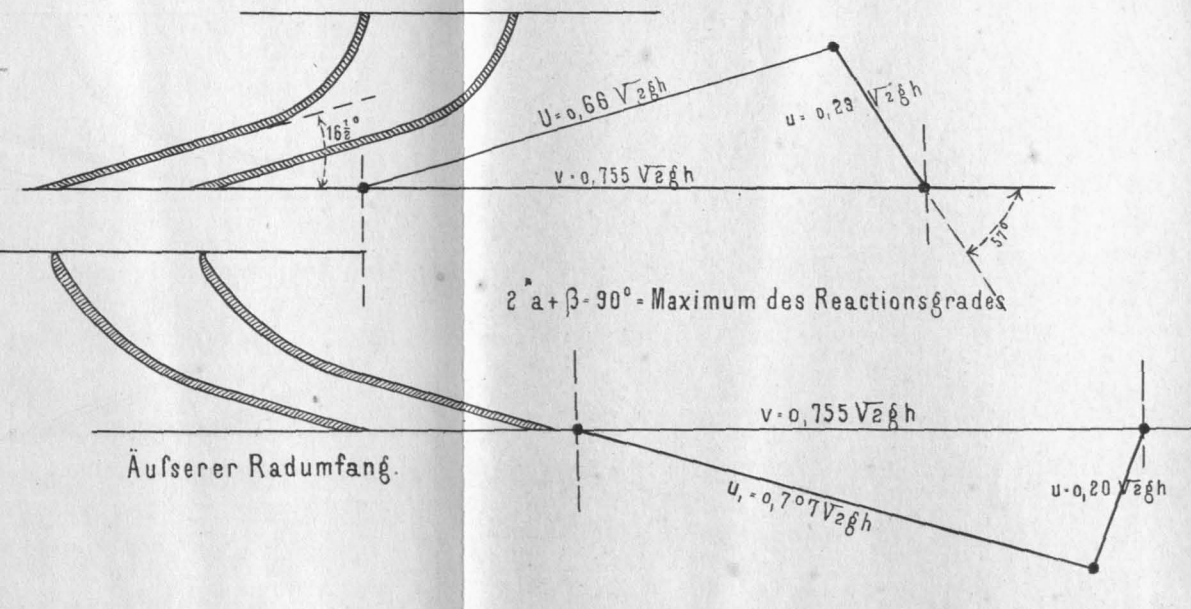
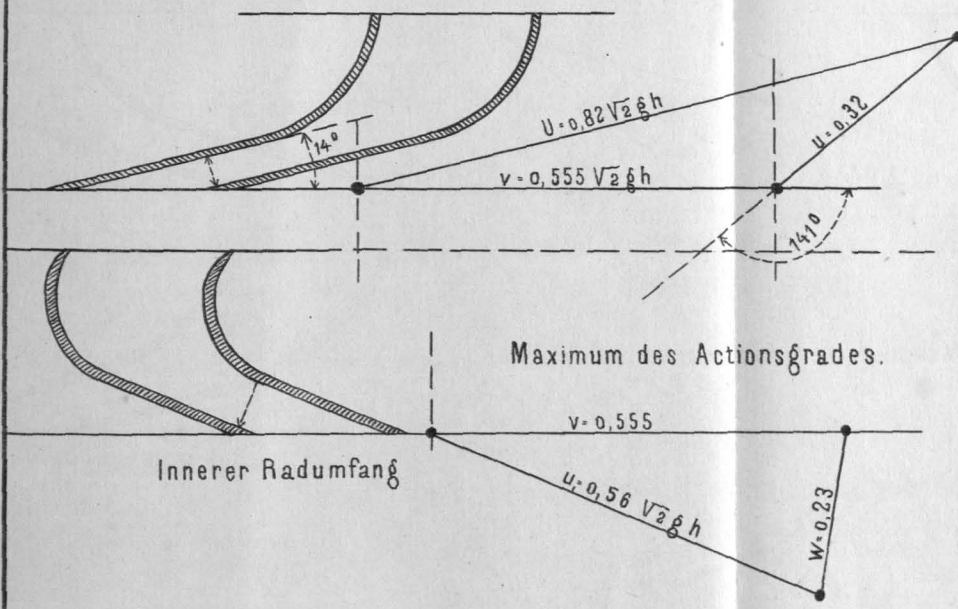


Fig. 4.

Fig. 3.

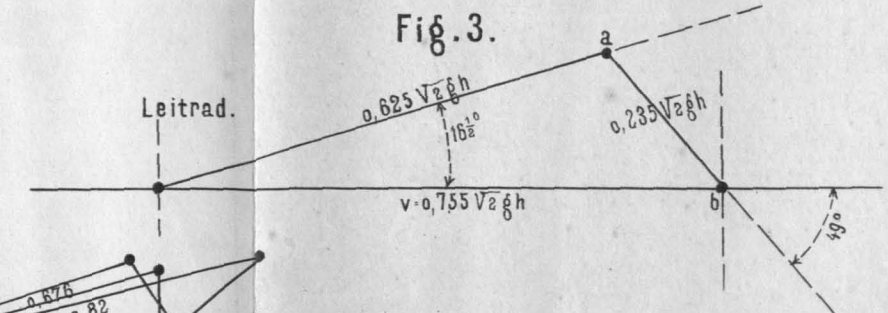
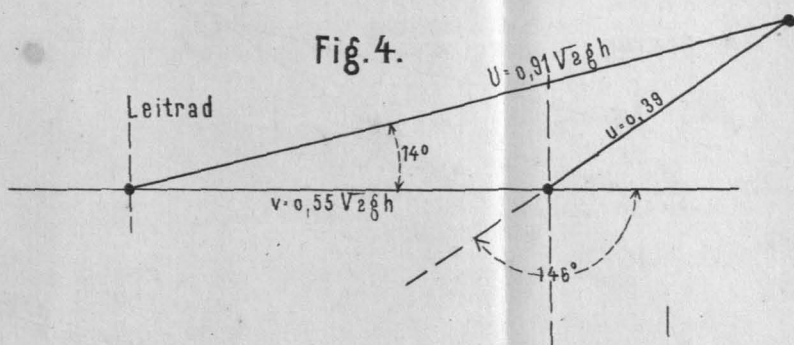
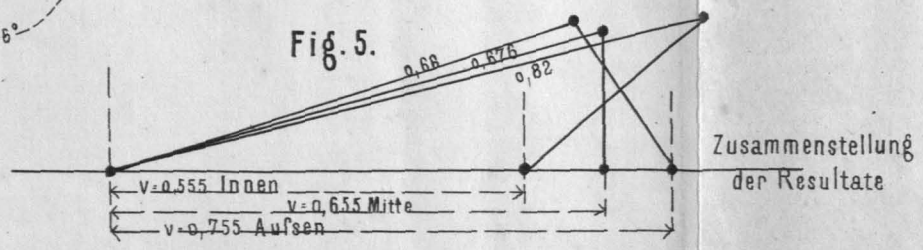
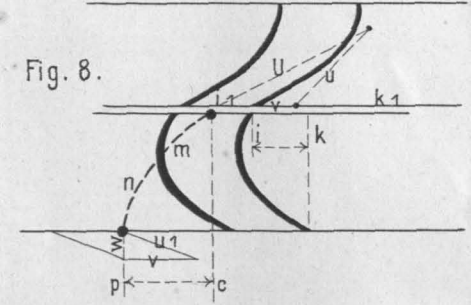
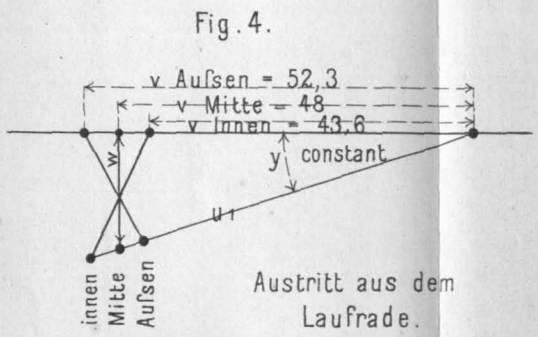
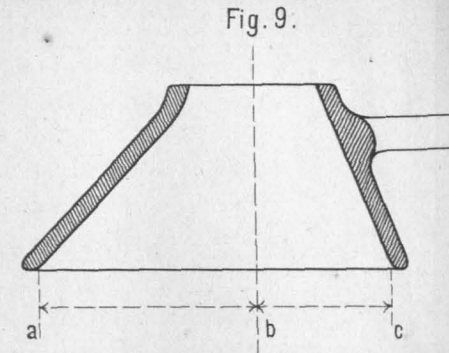
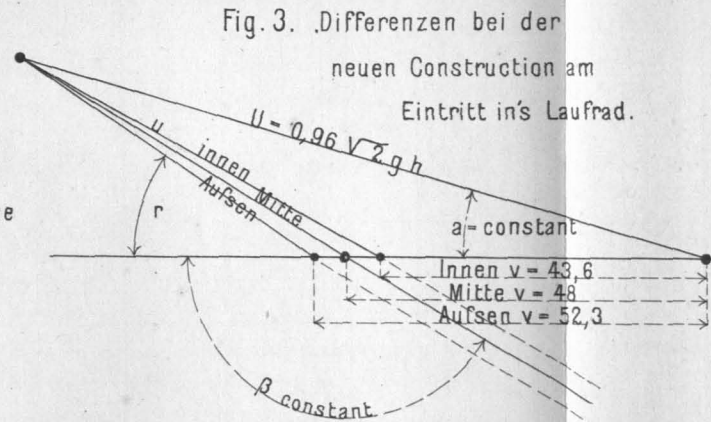
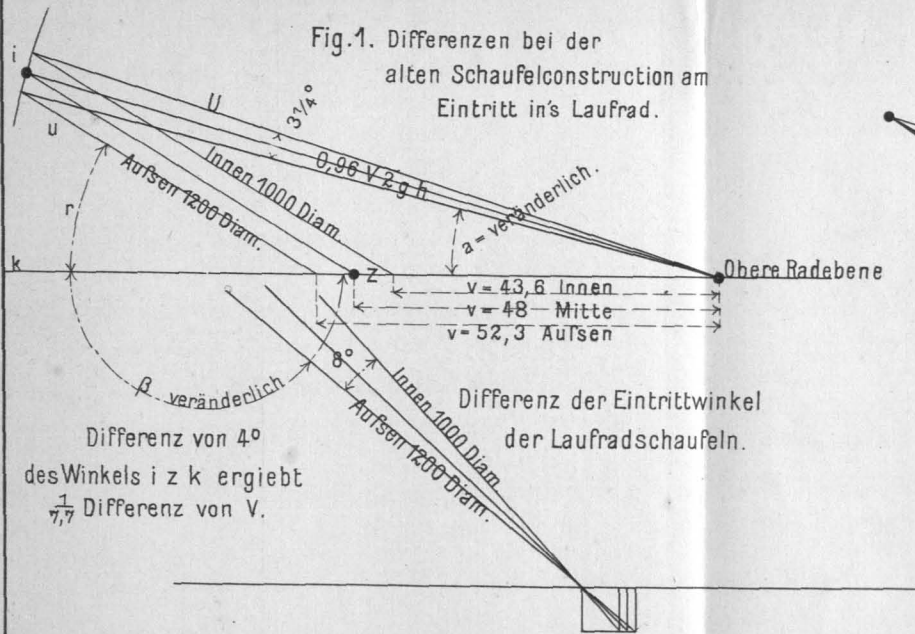


Fig. 5.

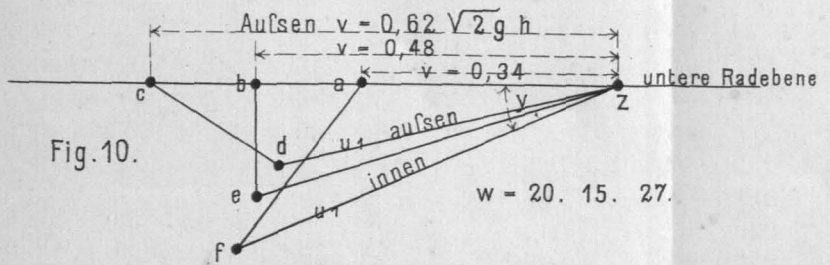
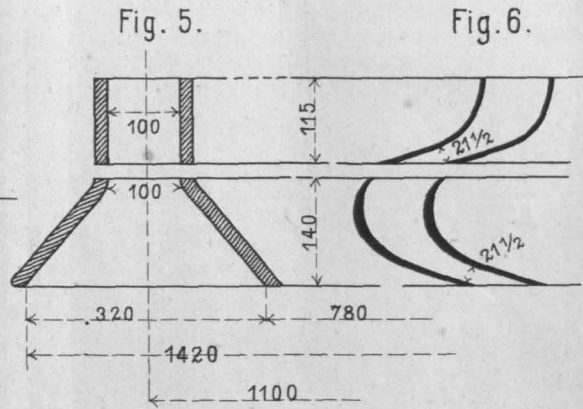
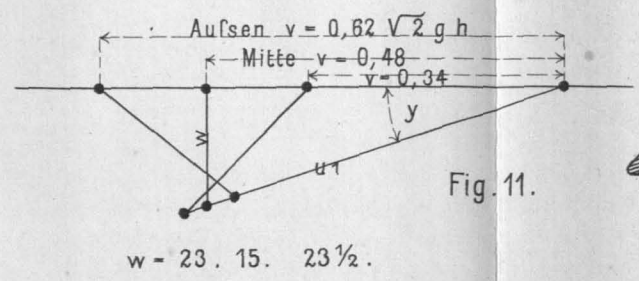
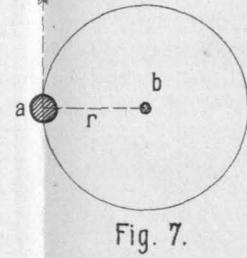


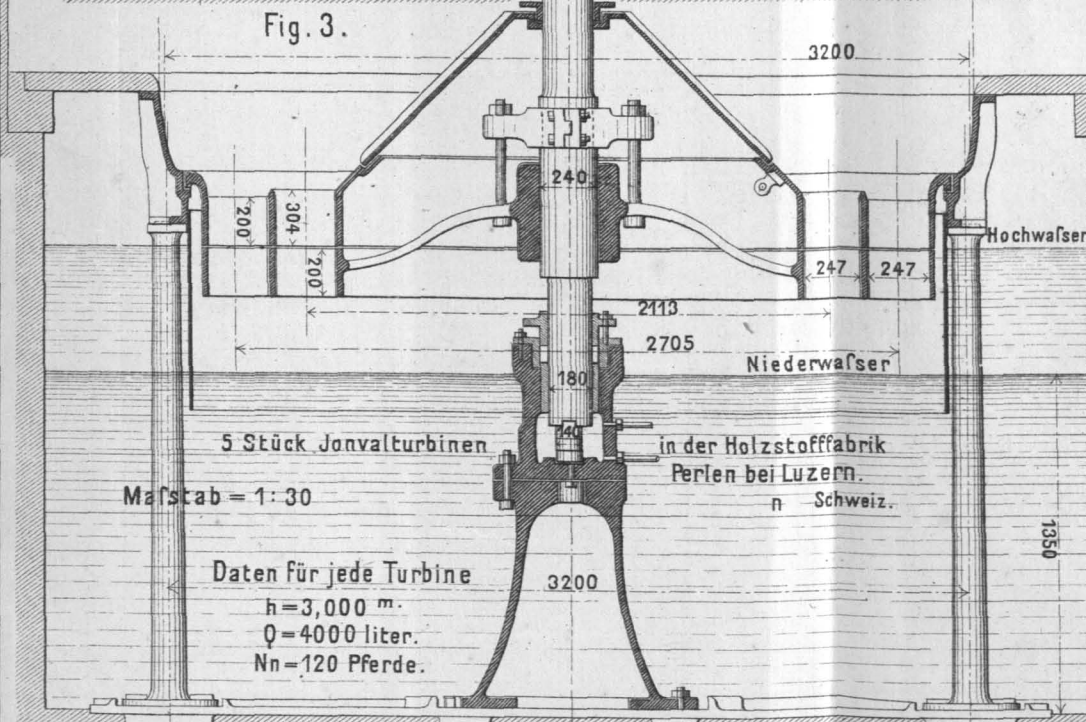
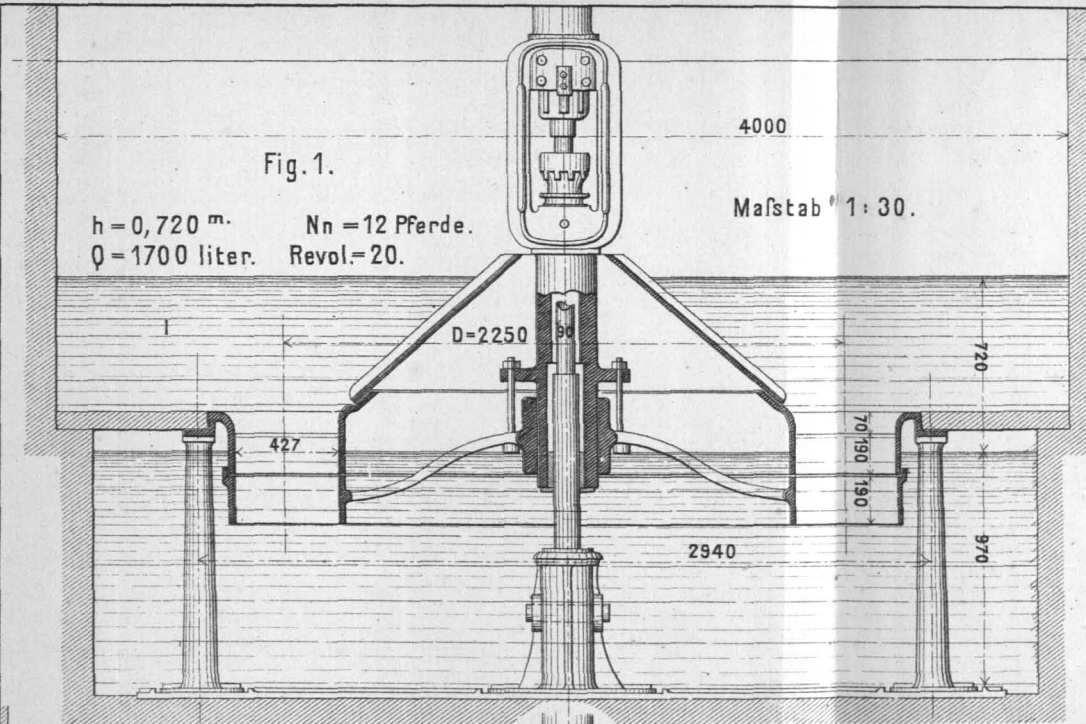


$w = 13. 15. 22 \frac{1}{2}$

$w^2 = 169. 225. 506.$

Verlustsumme $w^2 = 900.$





Daten.
 $h = 4,300 \text{ m.}$
 $Q = 2 \times 2500 \text{ liter.}$
 $N_n = 2 \times 105 \text{ Pferde.}$
 $\Delta = 0,4666 \text{ m}^2 \text{ meter.}$
 $\text{Revol.} = 57.$

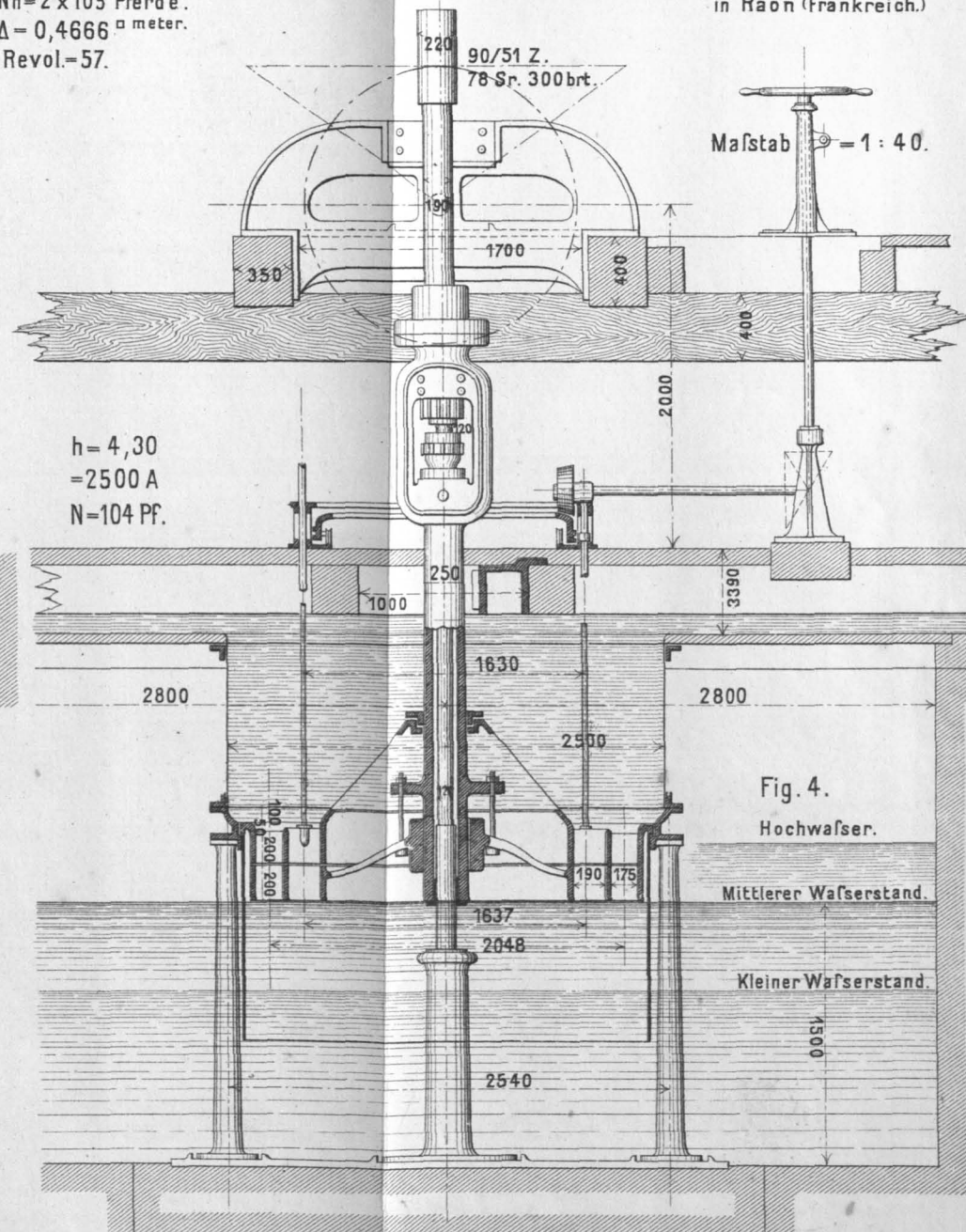
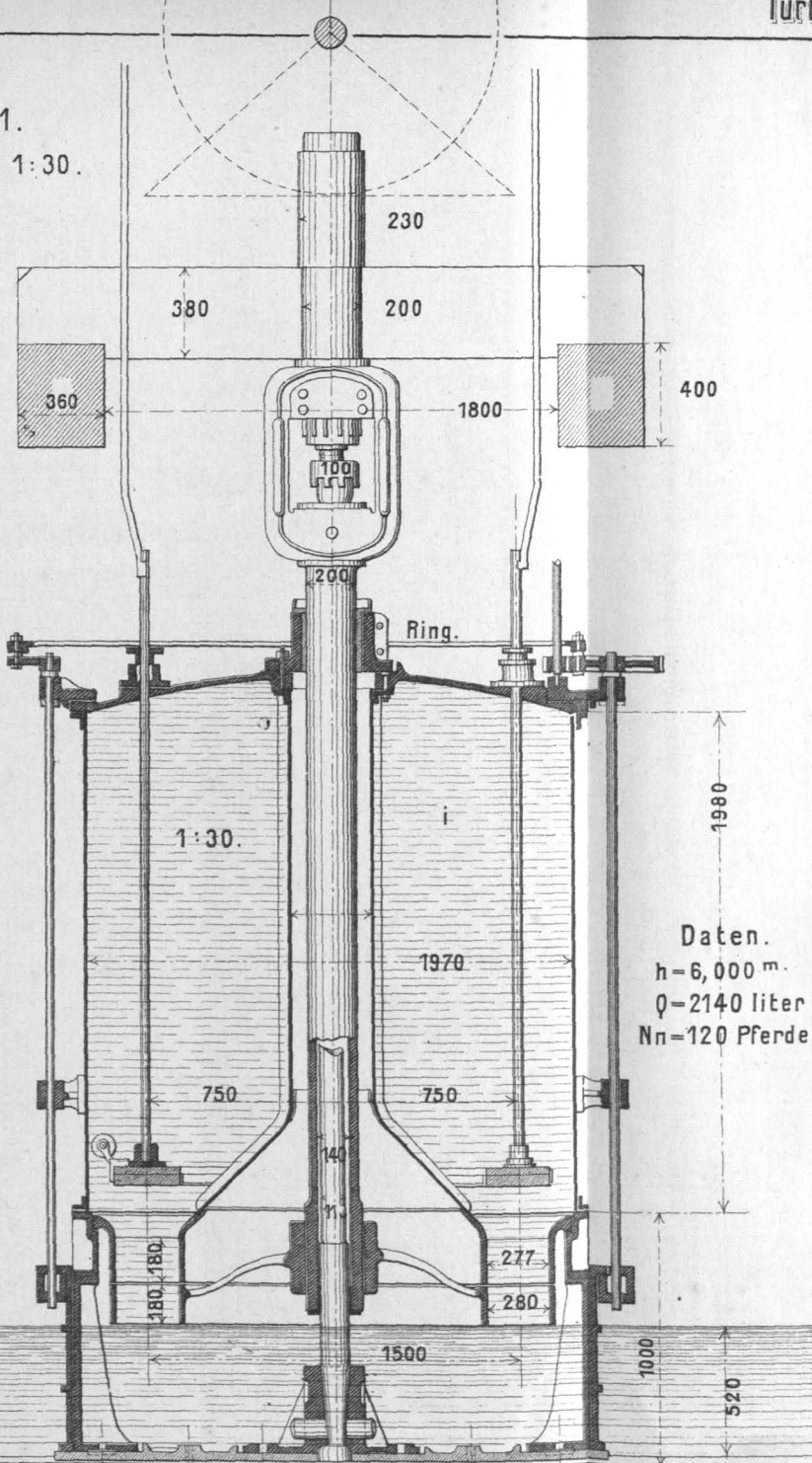


Fig. 1.
Maßstab 1:30.

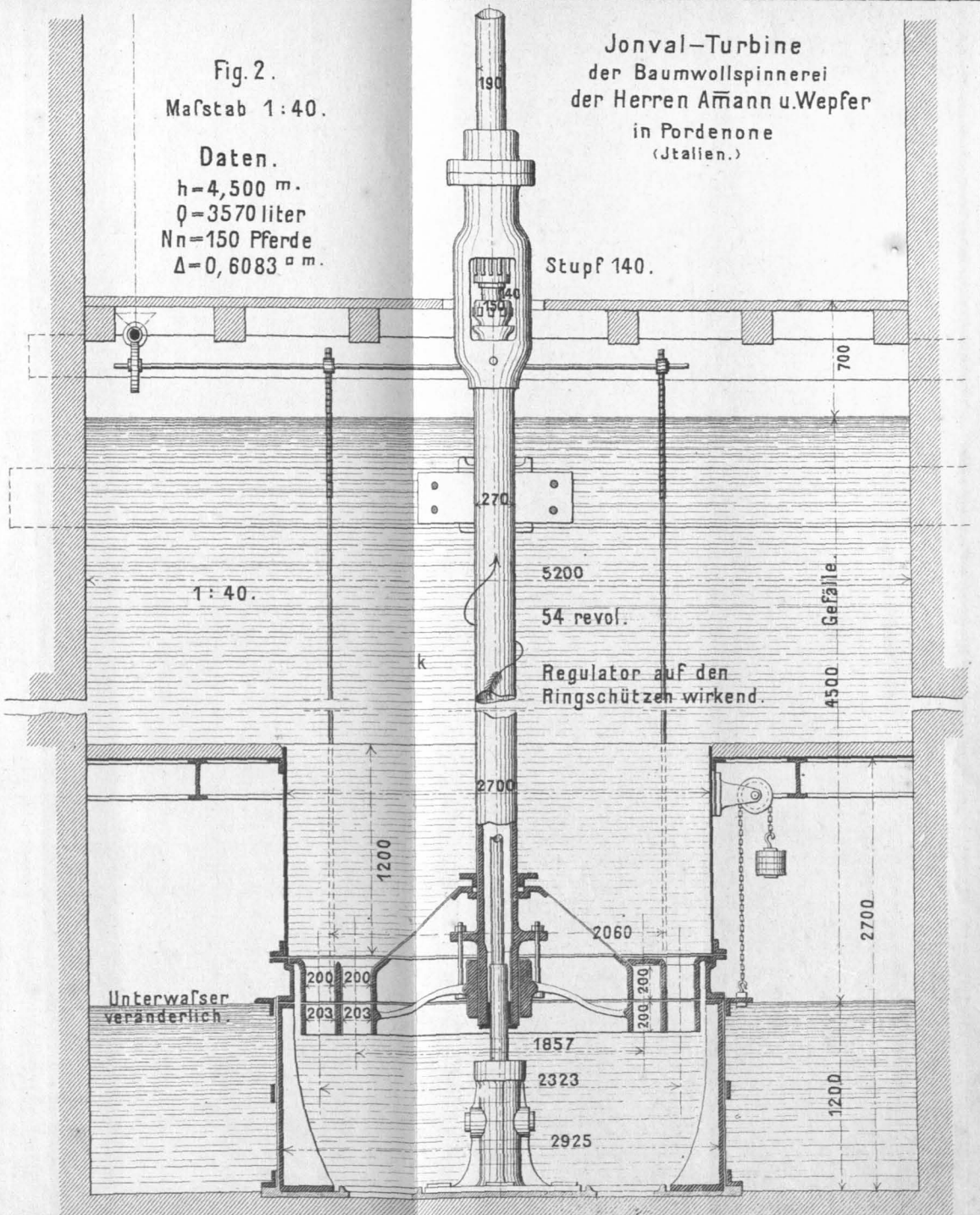


Daten.
 $h=6,000$ m.
 $Q=2140$ liter
 $N_n=120$ Pferde.

Fig. 2.
Maßstab 1:40.

Daten.
 $h=4,500$ m.
 $Q=3570$ liter
 $N_n=150$ Pferde
 $\Delta=0,6083$ m.

Jonval-Turbine
 der Baumwollspinnerei
 der Herren Amann u. Wepfer
 in Pordenone
 (Italien.)



Unterwasser
 veränderlich.

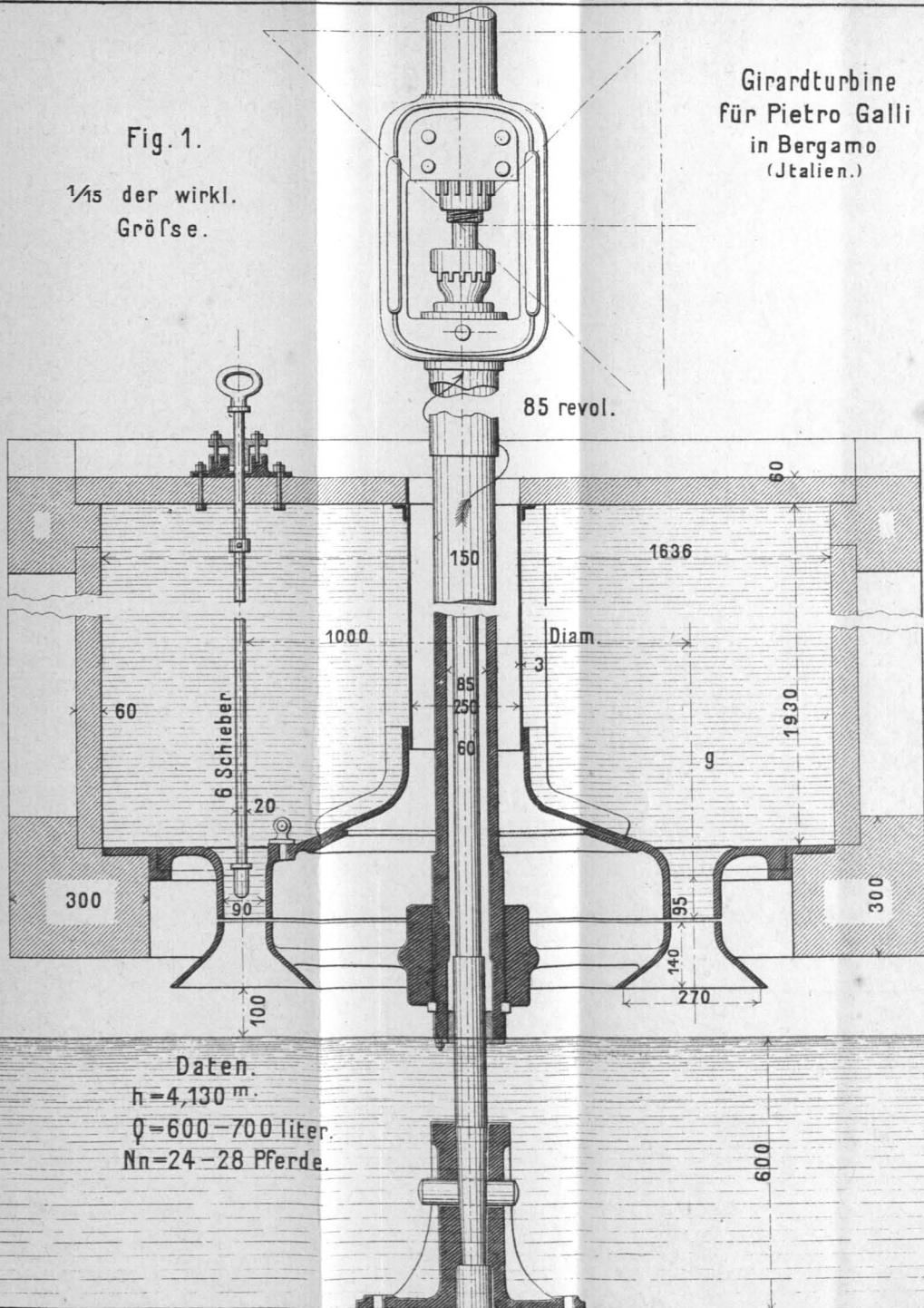
Regulator auf den
 Ringschützen wirkend.

4500 Gefälle.

Fig. 1.

1/4s der wirkl. Gröfse.

Girardturbine für Pietro Galli in Bergamo (Italien.)

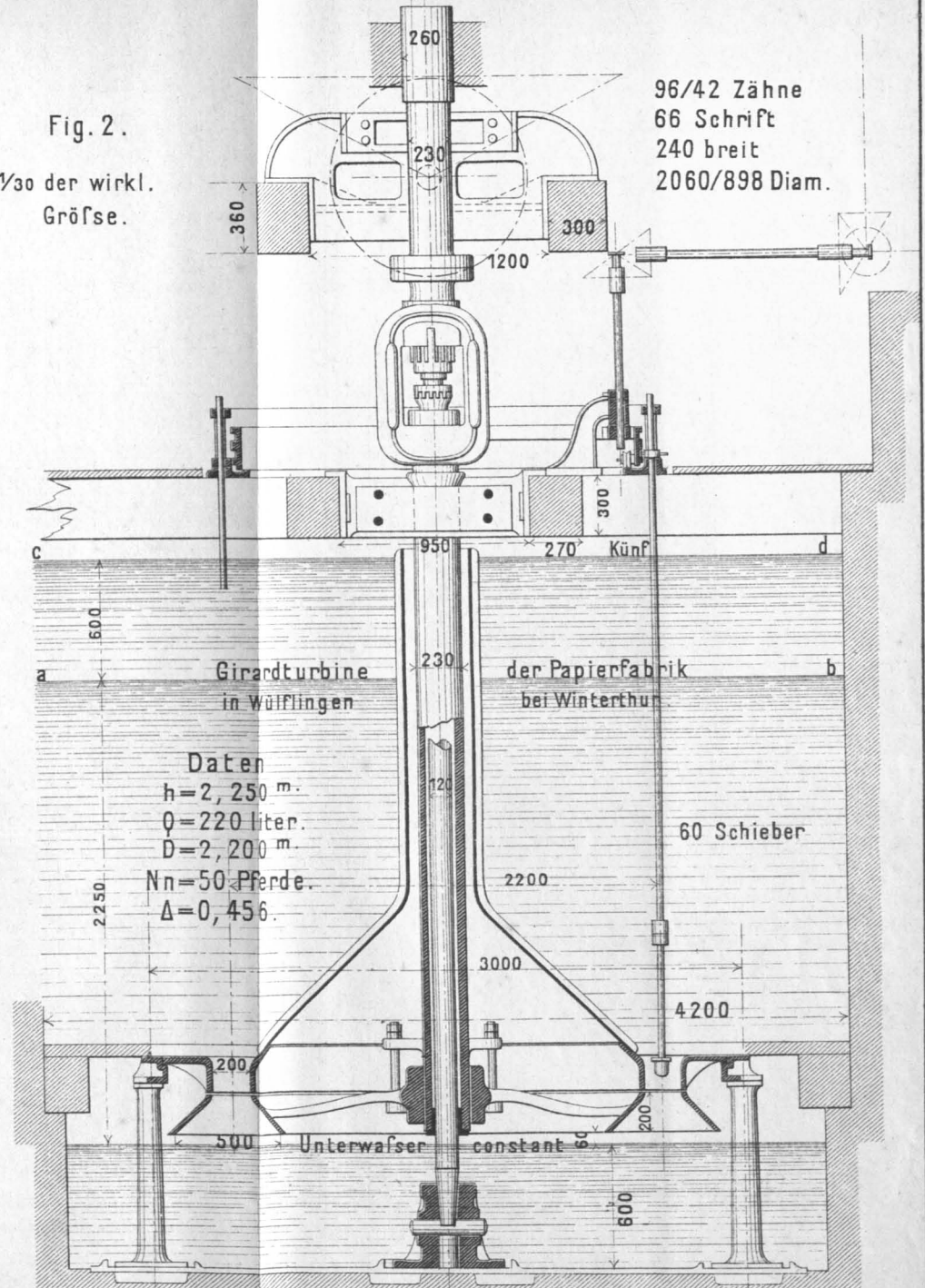


Daten.
 $h = 4,130$ m.
 $Q = 600 - 700$ liter.
 $Nn = 24 - 28$ Pferde.

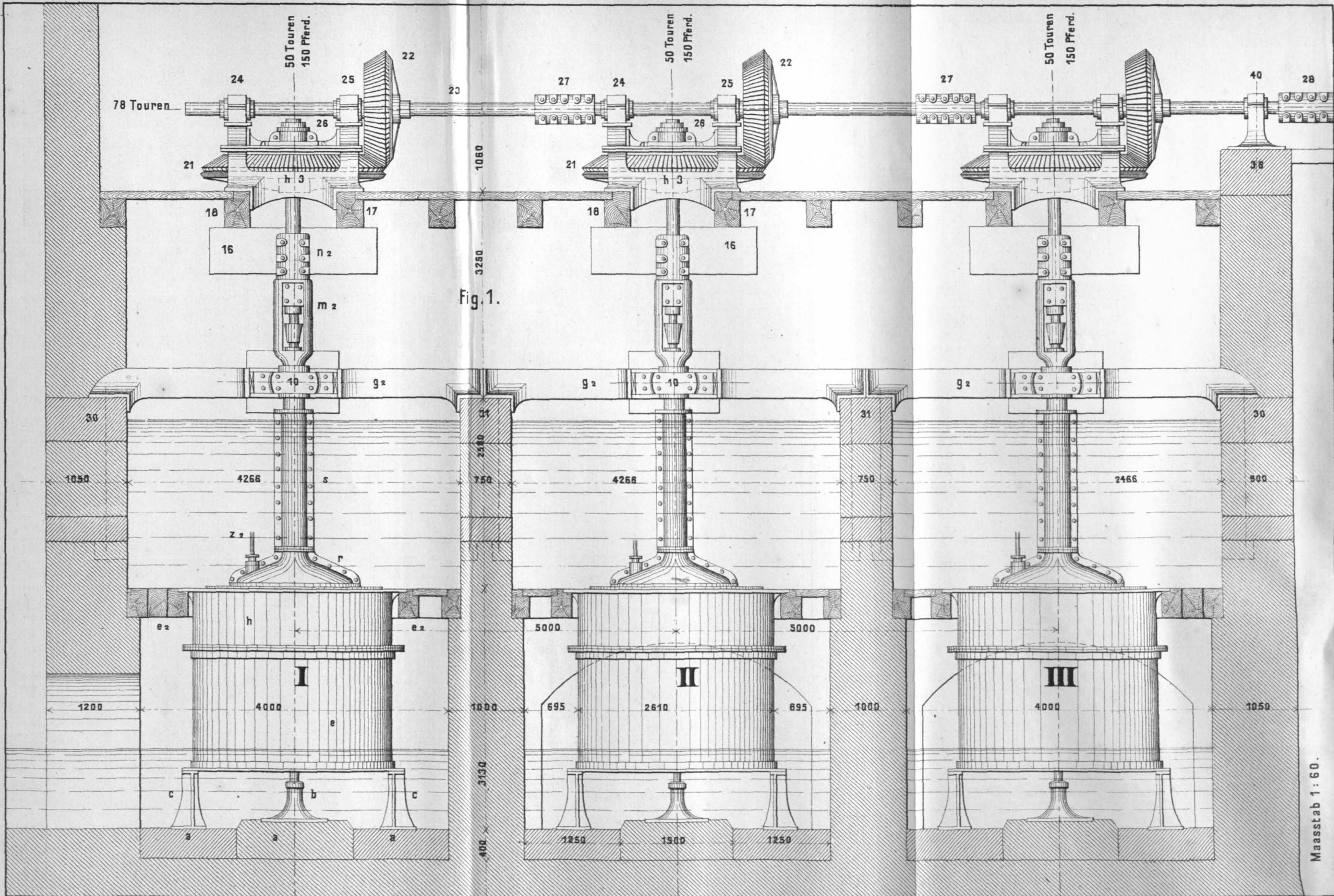
Fig. 2.

1/30 der wirkl. Gröfse.

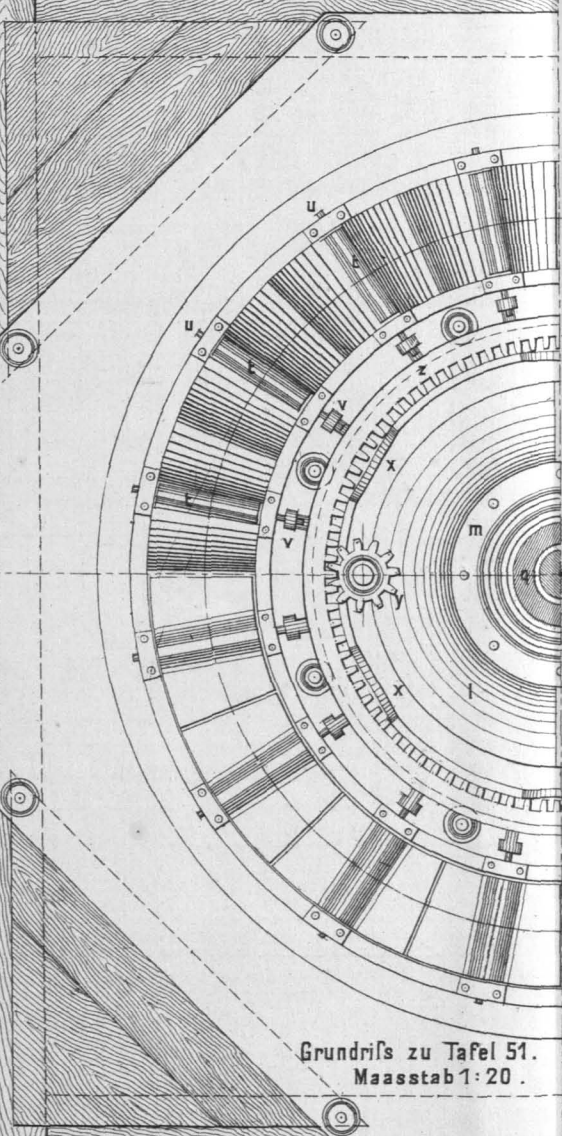
96/42 Zähne
 66 Schrift
 240 breit
 2060/898 Diam.



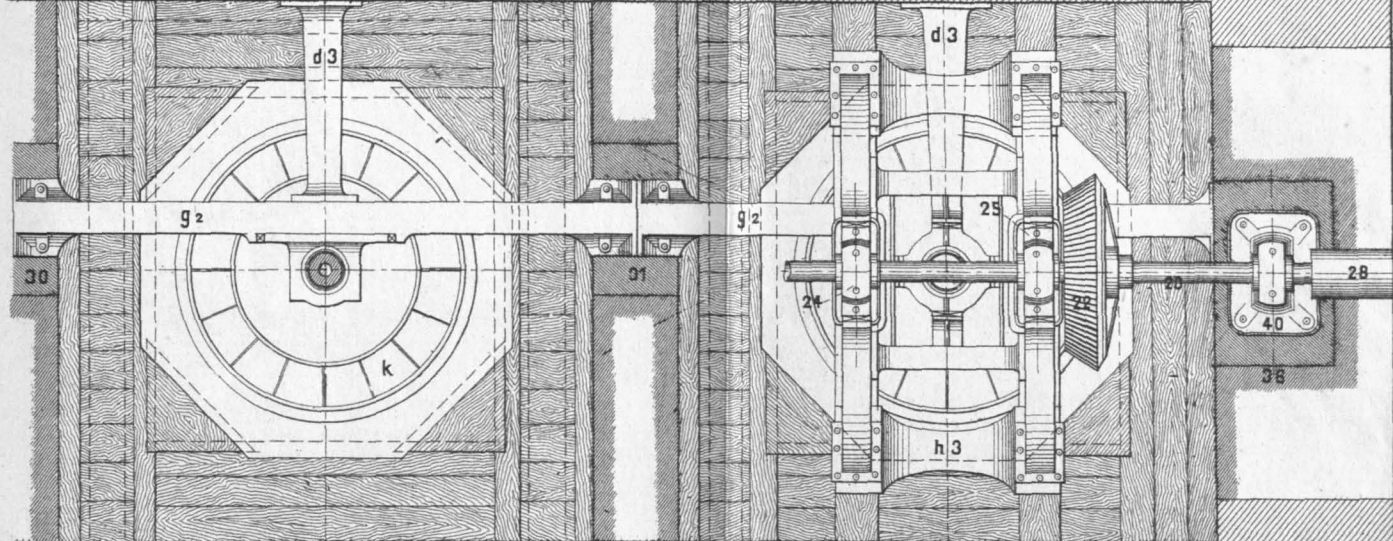
Daten
 $h = 2,250$ m.
 $Q = 220$ liter.
 $D = 2,200$ m.
 $Nn = 50$ Pferde.
 $\Delta = 0,456$.



Daten
 h = 4,300 m.
 Q = 3,500 Liter für jede Turbine
 Nu = 150 Pferde



Grundriß zu Tafel 51.
 Maasstab 1:20.



Grundriß zu Tafel 49.
 Maasstab 1:60.

