

No. 755,765.

PATENTED MAR. 29, 1904.

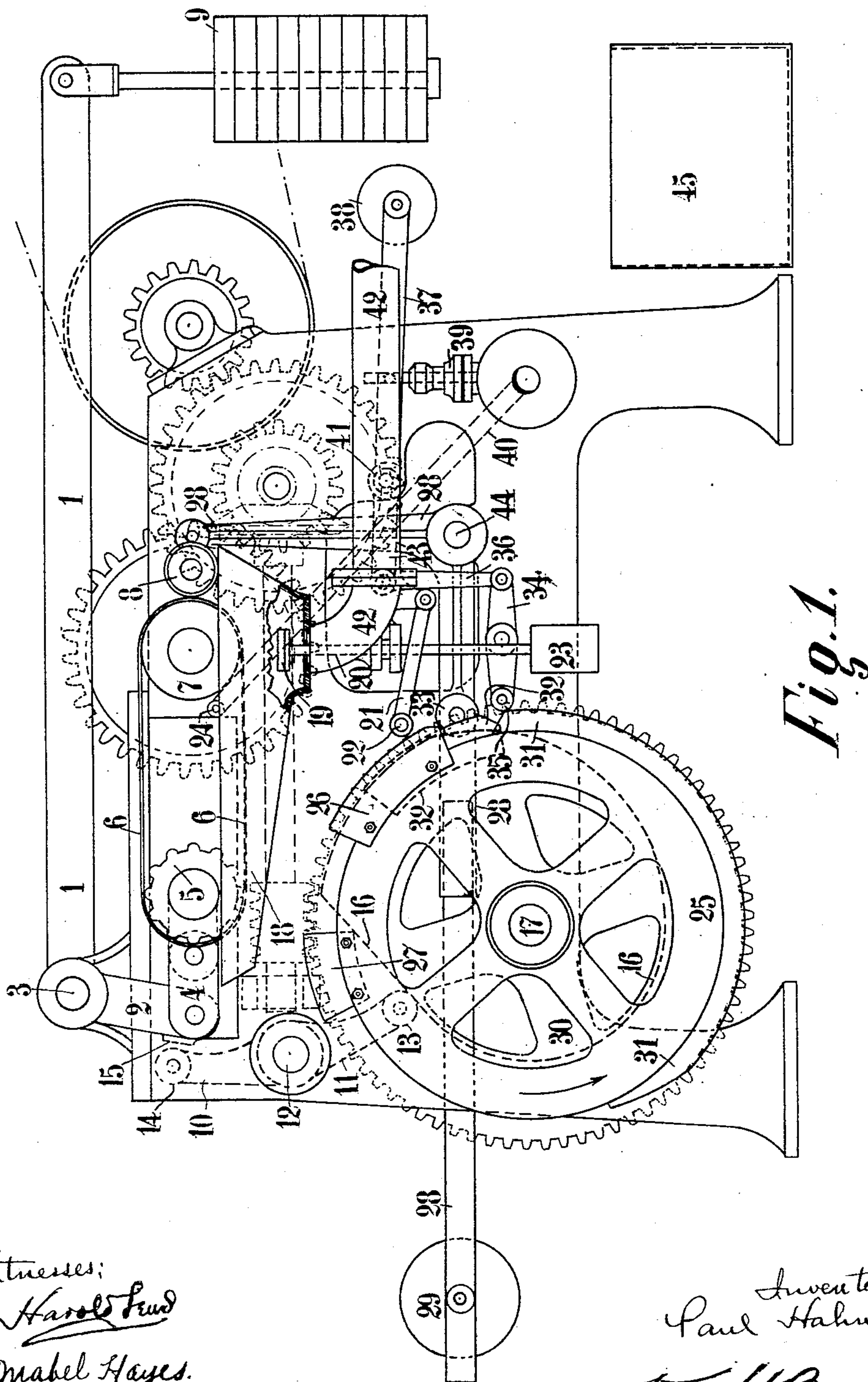
P. HAHN.

MACHINE FOR MERCERIZING YARN.

APPLICATION FILED NOV. 25, 1902.

NO MODEL.

8 SHEETS—SHEET 1.



Witnesses:
Harold Lund
Mabel Hayes.

Inventor
Paul Hahn,

Truitt Bros
Attorneys.

No. 755,765.

PATENTED MAR. 29, 1904.

P. HAHN.
MACHINE FOR MERCERIZING YARN.

APPLICATION FILED NOV. 25, 1902.

NO MODEL.

3 SHEETS—SHEET 2.

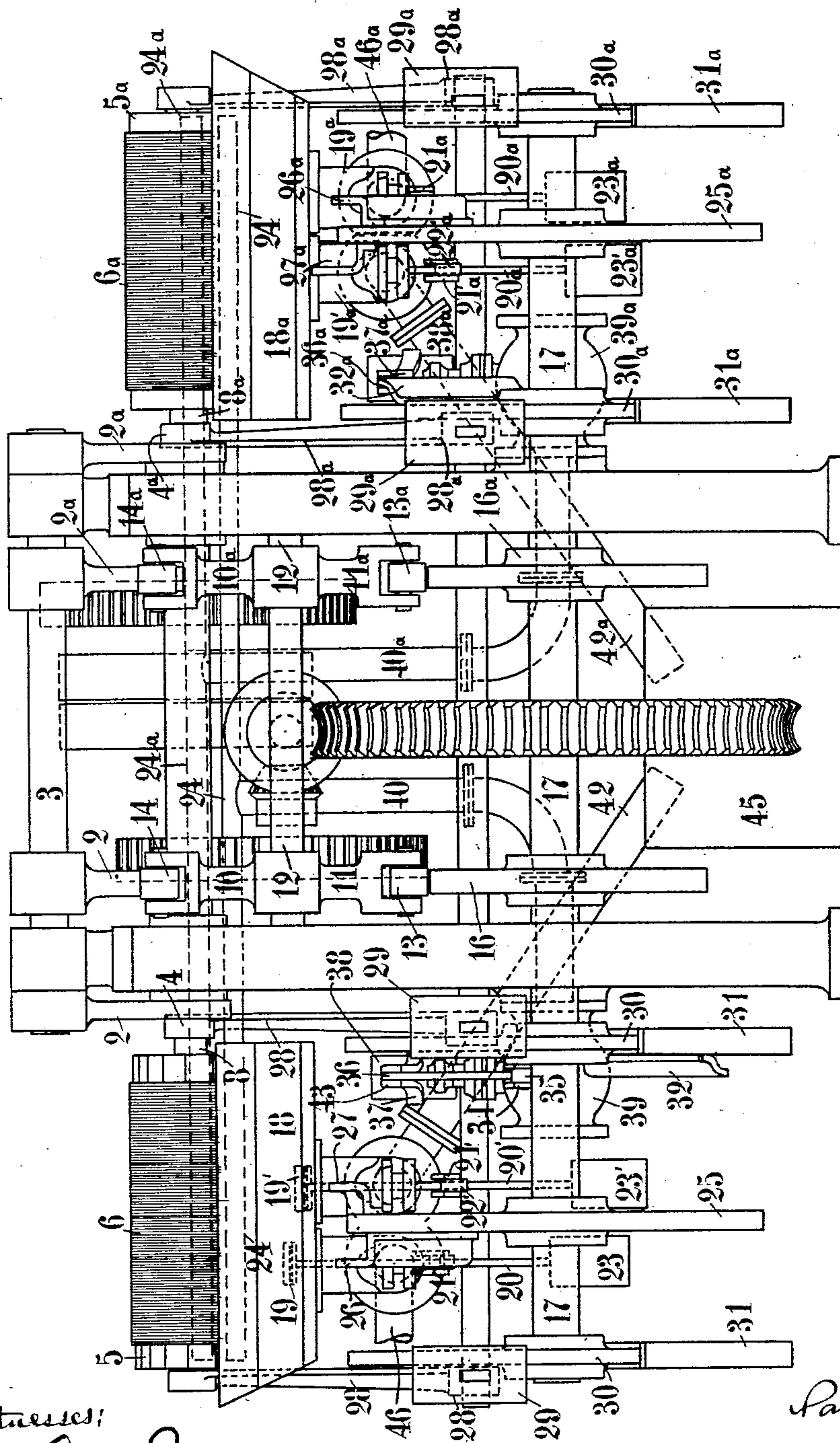


Fig. II.

Witnesses:

Harold Lund

Mabel Hayes.

Inventor:
Paul Hahn,

By *Knight Bros*
Attorneys.

No. 755,765.

PATENTED MAR. 29, 1904.

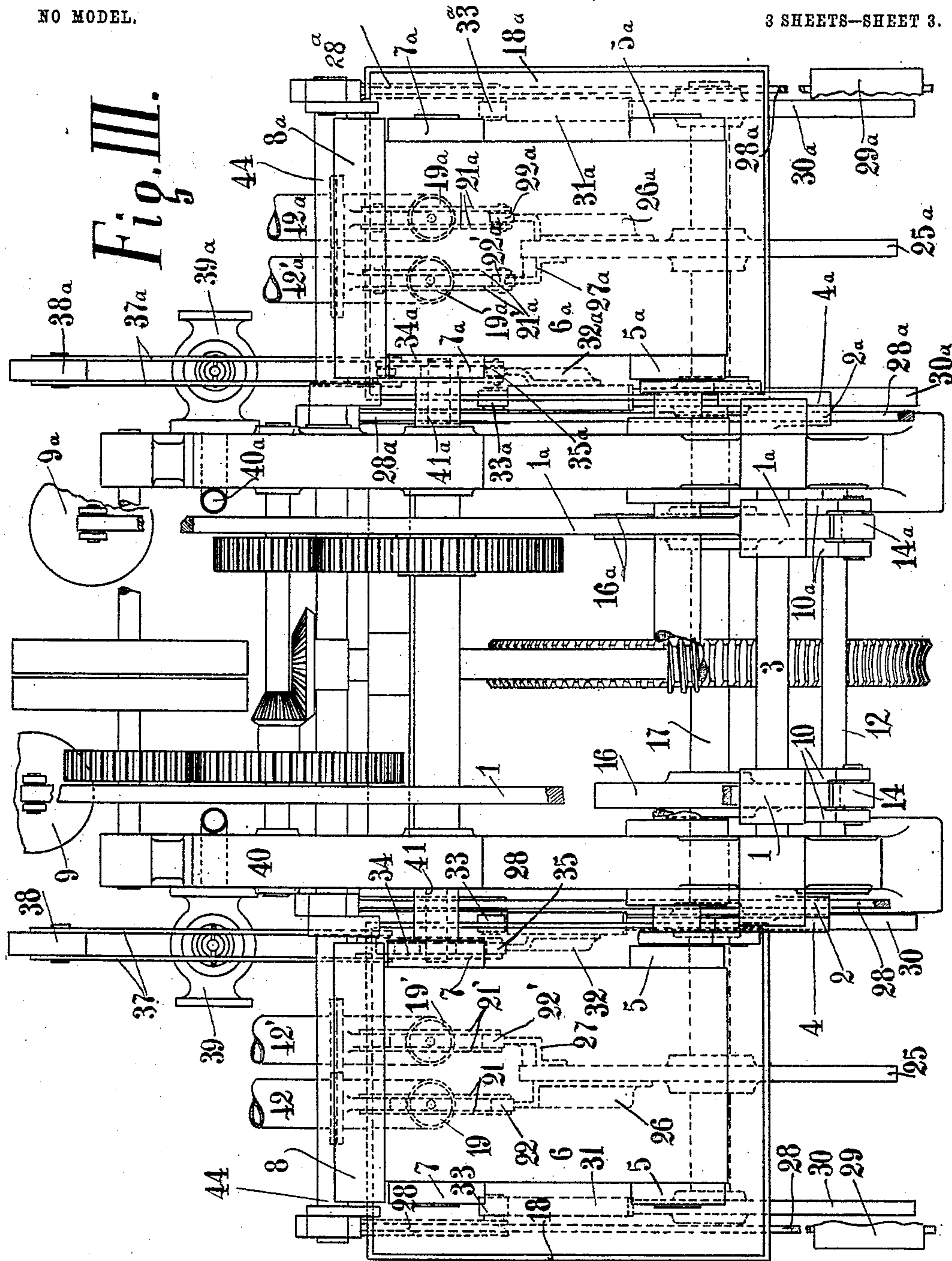
P. HAHN.

MACHINE FOR MERCERIZING YARN.

APPLICATION FILED NOV. 25, 1902.

NO MODEL.

3 SHEETS--SHEET 3.



Witnesses:

Harold Kunda

Mabel Hayes.

Inventor:
Paul Hahn

By Knight Bros Attorneys.

UNITED STATES PATENT OFFICE.

PAUL HAHN, OF NIEDERLAHNSTEIN, GERMANY.

MACHINE FOR MERCERIZING YARN.

SPECIFICATION forming part of Letters Patent No. 755,765, dated March 29, 1904.

Application filed November 25, 1902. Serial No. 132,832. (No model.)

To all whom it may concern:

Be it known that I, PAUL HAHN, engineer, a subject of the King of Prussia, Emperor of Germany, residing at Niederlahnstein, Rhine Province, Germany, have invented certain new and useful Improvements in Machines for Mercerizing Yarn in the Form of Skeins, of which the following is a full, clear, and exact description.

The present invention relates to a machine for mercerizing yarn in the form of skeins; and its essential features are chiefly that all the different working processes necessary for the mercerizing process—as, for instance, the stretching and releasing of the yarn, the opening and shutting of the inlet and outlet valves for the lye and the rinsing water, and also the wringing out of these fluids from the skeins—is done automatically by the rotation of a number of eccentrics and cam-disks fixed to a common axle, which for their part work on lever mechanisms acted upon by weights or springs. By uniting these eccentrics and cam-disks on a common axle the whole working of the machine is centralized, whereby not only great simplicity and sureness in working, but also a stout and short construction are warranted, and it is easy to have a full view of the machine.

The annexed drawings show an example of this invention.

Figure 1 is a side view, Fig. 2 is a front view, and Fig. 3 a top or plane view, of the machine. A vertical plane through the middle of Fig. 3 divides the same in two equal parts—that is to say, exactly the same mechanisms will be found on the right side as on the left side. The characters of reference are therefore the same on the left as on the right hand side, with the exception that the left-side parts have the index *a*.

Around the shaft 3 as stationary fulcrum an unequal-armed bent lever 1 2 (1^a 2^a) is arranged, whose longer arm bears a weight 9, (9^a), consisting of disks and capable of being regulated by adding or removing disks, while the shorter arm 2 by means of links 4 (4^a) is connected with the bearings of the fluted tension-cylinder 5, (5^a), said bearings gliding in guides in such a manner that the cylinder may

be approached to or removed from the fixed cylinder 7 (7^a) by turning the bent-lever arm 1 2, (1^a 2^a), which is to say that the skein 6 (6^a) around 5 (5^a) and 7 (7^a) may be tightened or loosened. The turning of the bent-lever arm 1 2 (1^a 2^a) is effected by means of the two-armed lever 10 11 (10^a 11^a) turning around the shaft 12 and provided at its ends with rollers 13 14, (13^a 14^a), the roller 13 lying in the rotation plan of a curved or eccentric disk 16 (16^a) turning around the common axle 17. When in the course of the rotation the obliquely-ascending part of the eccentric 16 (16^a) reaches the roller 13, (13^a), Fig. 2, the same is pressed to the left, and the lever 10 (10^a) and the roller 14 (14^a) effects by its pressure against the block 15 of the lever-arm 2 (2^a) a turning of the same to the right, which is equivalent to a raising of the weight 9 (9^a) and loosening of the skein 6 (6^a) in nearing the cylinder 5 (5^a) to cylinder 7, (7^a), so that the yarn can now be taken off and a new skein laid on both cylinders. After this influence by the weight 9 (9^a) a gradual return motion of the lever-arms 1 2 (1^a 2^a) and 10 11 (10^a 11^a) takes place during the further rotation of the eccentric 16, (16^a), because now the part of the eccentric with the smaller diameter can move freely past the roller 13 (13^a) without touching the same. When the tightening of the yarn has begun by the roller 13 (13^a) sliding down from the highest points of the eccentric 16, (16^a), the impregnation of the skein 6 (6^a) with lye is effected by the automatic opening of a valve 39^a, common to both sides of the machine, which forms the stop appliance of a lye-conducting pipe, (not shown,) the lye in said pipe being under pressure, and thereby entering into a pipe 40^a when the valve 39^a is opened. Said pipe 40^a leads to a horizontal pipe 24^a, which leads into tanks 18, (18^a.) The opening of the lye-valve 39^a is effected by the disk 30^a turning on the axle 17, and provided with the cam 32^a; further, by the two-armed lever 34^a, carrying at its end the roller 35^a, and by the link 36^a, connected with a lever turning on 41^a, the left arm of which is indicated as 43^a and the right arm as 37^a. Said lever is regulated by a weight 38^a and by a pin connected with the spindle of the valve 39^a. When the cam 32^a

during the turning of 30^a hits the roller 35^a and lifts it, the left part of the weight-lever arm 43^a is drawn down around its turning-point 41^a, while the right lever-arm 37^a, with the weight 38^a, is lifted, which is also the spindle of the valve 39^a, connected with the lever-arm 37^a by a pin. When the spindle is thus lifted, the lye, which stands under pressure and is introduced into 39^a by a pipe, (not shown,) flows through the pipe 40^a into the spirt-tube 24^a, which connects both tanks 18, (18^a,) and is provided with small openings toward the yarn, and the skein, which moves inside the tanks from left to right, is syringed with lye. Simultaneously with the opening of the lye-inlet valve 39^a also a movement of the rubber cylinders 8, (8^a,) directed by the lever-arms 28, (28^a,) takes place toward the yarn-cylinders 7, (7^a,) as the rollers 33, (33^a,) held up till now by the eccentric bosses 31 (31^a) of the disks 30 (30^a) and fixed to the horizontal parts of the bent lever-arms 28, (28^a,) swinging round the common axle 44, now slide down from the bosses and turn under the influence of the weight 29 downward around the axle 44, whereby the wringing-cylinders 8 (8^a) are pressed to the circumference of the tension-cylinders 7, (7^a,) so that the lye is pressed through the core of the yarn, the waste flowing back to the tanks 18, (18^a,) During the further rotation of the right-side disk 30^a around the axle 17, the automatical shutting of the lye-valve 39^a is effected by the weight 38^a, when the roller 35^a glides from the cam 32^a. Now the lye in the tanks must be let out, which is attained by means of two outlet-valves 19', (19^{a'},) arranged to the tanks 18, (18^a,) Together there are four outlet-valves—two, viz., 19 19', on the left and two, viz., 19^a 19^{a'} on the right hand side. The valves 19' 19^{a'} are for the outlet of the lye, and the valves 19 19^a for the outlet of the rinsing-water. The two outlet-valves on the same side are put in action by a single cam-disk 25, (25^a,) provided with two cams 26 27, (26^a 27^a,) When during the turning of the axle 17 the cams 27 (27^a) of the disks 25 (25^a) lift the rollers 22', (22^{a'},) the lye-valve 19' (19^{a'}) of each tank 18 (18^a) is opened by means of the lever-arms 21' (21^{a'}) and the spindles 20', (20^{a'},) provided with the weights 23', (23^{a'},) and the lye flows through the pipe 42' (42^{a'}) into the tank 45. The cam 27 (27^a) having passed the roller 22', (22^{a'},) the weight 23 (23^a) drops the valve-rod 20' (20') and shuts the valve 19. On the left-hand side the cam 32 of the disk 30 now comes in contact with the roller 25 of the lever 34 and by means of the lever connection 36 37 a working process similar to that of the lye-valve 39^a on the right-hand side takes place; it is to say, the water-inlet valve 39 is opened by the lifting of the spindle, which results in the flowing of the rinsing-water into the pipes 40 24 and the filling of both tanks with said water. The rinsing-water syringes the yarn by means

of the syringe arrangement of the pipe 24. When the yarn is thus well rinsed and the waste has been wrung out by the wringing device 8 (8^a) in the same manner as by the lye, the disk 25 (25^a) comes in action, as this time the cam 26 (26^a) of said disk moves past the roller 22 of the lever 21, (21^a,) raises the latter, and thus opens the water-outlet 19, (19^a,) so that now the water can run out from the tanks 18 (18^a) through the pipe 42 42. Now the lever 10 11 comes again into action by running down from the boss of the eccentric 16, (16^a,) the skein 6 (6^a) is loosened and can be removed and substituted by a new one, the treatment of which is effected in the very same manner.

Having described my invention, what I claim is—

1. In a machine for mercerizing yarn in the form of skeins, the combination of a rotatable shaft, a pair of rigid cam-disks on said shaft, a tank, a cylinder rotatably mounted in fixed bearings in said tank, a second cylinder rotatably mounted in bearings gliding in said tank, a lye-conducting pipe in connection with said tank and having openings toward the first cylinder, an inlet-valve in said pipe, means operated by one of the cam-disks for causing said second cylinder to approach said first cylinder, and means operated by the cam of the other cam-disk for opening said inlet-valve.

2. In a machine for mercerizing yarn in the form of skeins, the combination of a rotatable shaft, a pair of rigid cam-disks on said shaft, a tank, a cylinder rotatably mounted in fixed bearings in said tank, a second cylinder rotatably mounted in bearings gliding in said tank, a lye-conducting pipe in connection with said tank and having openings toward the first cylinder, an inlet-valve in said pipe, means operated by the cam of one of the cam-disks for causing said second cylinder to approach said first cylinder, means for removing said second cylinder from said first cylinder, means operated by the cam of the other cam-disk for opening said inlet-valve, and means for shutting said inlet-valve.

3. In a machine for mercerizing yarn in the form of skeins, the combination of a rotatable shaft, a number of rigid cam-disks on said shaft, a tank, a cylinder rotatably mounted in fixed bearings in said tank, a second cylinder rotatably mounted in bearings gliding in said tank, a lye-conducting pipe in connection with said tank and having openings toward the first cylinder, an inlet-valve in said pipe, a water-conducting pipe in connection with said tank, an inlet-valve in said pipe, and means operated by the cams of said cam-disks for causing said second cylinder to approach said first cylinder, for opening said lye-inlet valve and for opening said water-inlet valve.

4. In a machine for mercerizing yarn in the form of skeins, the combination of a rotatable shaft, a number of rigid cam-disks on said shaft, a tank, a cylinder rotatably mounted in

fixed bearings in said tank, a second cylinder rotatably mounted in bearings gliding in said tank, a lye-conducting pipe in connection with said tank and having openings toward the first cylinder, an inlet-valve in said pipe, a water-conducting pipe in connection with said tank, an inlet-valve in said pipe, means operated by the cams of said cam-disks for causing said second cylinder to approach said first cylinder, for opening said lye-inlet valve and for opening said water-inlet valve, and means for removing said second cylinder from said first cylinder, for shutting said lye-inlet valve and for shutting said water-inlet valve.

5. In a machine for mercerizing yarn in the form of skeins, the combination of a rotatable shaft, a number of rigid cam-disks on said shaft, a tank, a cylinder rotatably mounted in fixed bearings in said tank, a second cylinder rotatably mounted in bearings gliding in said tank, a lye-conducting pipe in connection with said tank and having openings toward the first cylinder, an inlet-valve in said pipe, a water-conducting pipe in connection with said tank, an inlet-valve in said pipe, an outlet-valve in said tank, and means operated by the cams of the said cam-disks for causing said second cylinder to approach said first cylinder, for opening said lye-inlet valve, for opening said water-inlet valve and for opening said outlet-valve.

6. In a machine for mercerizing yarn in the form of skeins, the combination of a rotatable shaft, a number of rigid cam-disks on said shaft, a tank, a cylinder rotatably mounted in fixed bearings in said tank, a second cylinder rotatably mounted in bearings gliding in said tank, a lye-conducting pipe in connection with said tank and having openings toward the first cylinder, an inlet-valve in said pipe, a water-conducting pipe in connection with said tank, an inlet-valve in said pipe, an outlet-valve in said tank, means operated by the cams of the said cam-disks for causing said second cylinder to approach said first cylinder, for opening said lye-inlet valve, for opening said water-inlet valve and for opening said outlet-valve, and means for removing said second cylinder from said first cylinder, for shutting said lye-inlet valve, for shutting said water-inlet valve, and for shutting said outlet-valve.

7. In a machine for mercerizing yarn in the form of skeins, the combination of a rotatable shaft, a number of rigid cam-disks on said shaft, a tank, a cylinder rotatably mounted in fixed bearings in said tank, a second cylinder rotatably mounted in bearings gliding in said tank, a lye-conducting pipe in connection with said tank and having openings toward said first cylinder, an inlet-valve in said pipe, a water-conducting pipe in connection with said tank, an inlet-valve in said pipe, an outlet-valve in said tank, a wringing-cylinder movable toward said first cylinder and means operated by the cams of the said cam-disks for causing said second cylinder to approach said

first cylinder, for opening said lye-inlet valve, for pressing said wringing-cylinder toward said first cylinder, for opening said water-inlet valve and for opening said outlet-valve.

8. In a machine for mercerizing yarn in the form of skeins, the combination of a rotatable shaft, a number of rigid cam-disks on said shaft, a tank, a cylinder rotatably mounted in fixed bearings in said tank, a second cylinder rotatably mounted in bearings gliding in said tank, a lye-conducting pipe in connection with said tank and having openings toward said first cylinder, an inlet-valve in said pipe, a water-conducting pipe in connection with said tank, an inlet-valve in said pipe, an outlet-valve in said tank, a wringing-cylinder movable toward said first cylinder, means operated by the cams of the said cam-disks for causing said second cylinder to approach said first cylinder, for opening said lye-inlet valve, for pressing said wringing-cylinder against said first cylinder, for opening said water-inlet valve and for opening said outlet-valve, and means for removing said second cylinder from said first cylinder, for shutting said lye-inlet valve, for removing said wringing-cylinder from said first cylinder, for shutting said water-inlet valve and for shutting said outlet-valve.

9. In a machine for mercerizing yarn in the form of skeins, the combination of a rotatable shaft, a number of rigid cam-disks on said shaft, a tank, a cylinder rotatably mounted in fixed bearings in said tank, a second cylinder rotatably mounted in bearings gliding in said tank, a gliding wringing-cylinder movable toward said first cylinder, a lye-conducting pipe in connection with said tank and having openings toward said first cylinder, an inlet-valve in said pipe, a water-conducting pipe in connection with said tank and having openings toward said first cylinder, an inlet-valve in said pipe, an outlet-valve in said tank, a number of lever mechanisms connected with said second cylinder, said wringing-cylinder, said lye-inlet valve, said water-inlet valve and said outlet-valve, and rollers on said lever mechanisms, said rollers being positioned in the rotation planes of the cam-disks and capable of being operated by the cams during the rotation of the disks.

10. In a machine for mercerizing yarn in the form of skeins, the combination of a rotatable shaft, a number of rigid cam-disks on said shaft, a tank, a cylinder rotatably mounted in fixed bearings in said tank, a second cylinder rotatably mounted in bearings gliding in said tank, a wringing-cylinder movable toward said first cylinder, a lye-conducting pipe in connection with said tank and having openings toward said first cylinder, an inlet-valve in said pipe, a water-conducting pipe in connection with said tank, and having openings toward said first cylinder, an inlet-valve in said pipe, an outlet-valve in said tank, a number of lever mechanisms connected with said second

cylinder, said wringing-cylinder, said lye-inlet
valve, said water-inlet valve and said outlet-
valve, rollers on said lever mechanisms, said
rollers being positioned in the rotation planes
5 of the said cam-disks and capable of being op-
erated by the cams during the rotation of said
disks, and a number of counterweights con-
nected with said second cylinder, said wring-

ing-cylinder, said lye-inlet valve, said water-
inlet valve and said outlet-valve.

In witness whereof I subscribe my signature
in presence of two witnesses.

PAUL HAHN.

Witnesses:

CARL SCHMITT,

GUSTAV LINNHOLD.