

No. 754,784.

PATENTED MAR. 15, 1904.

H. LINDENBERG.
APPARATUS FOR TREATING YARN.

APPLICATION FILED AUG. 6, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 2.

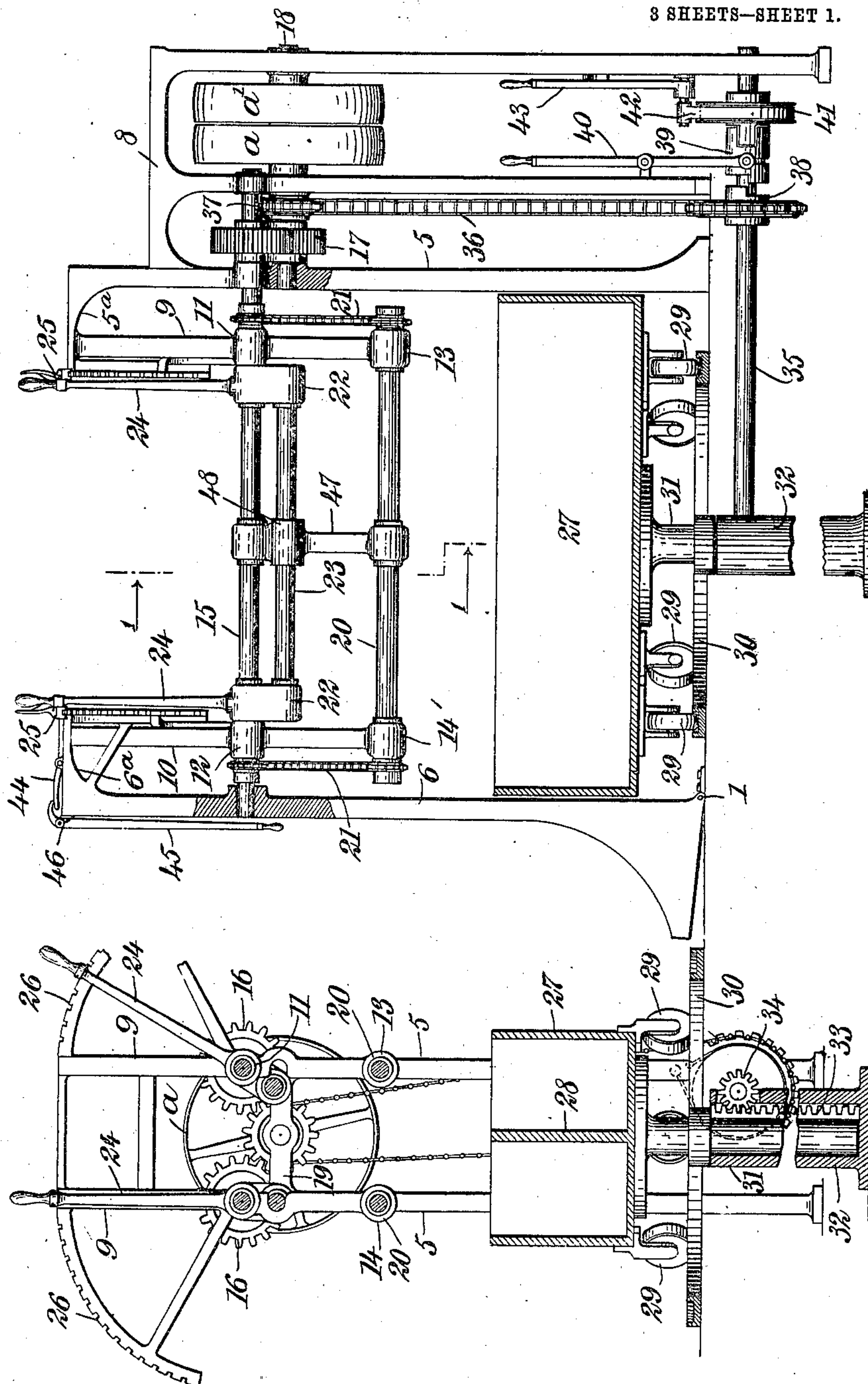


Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 5.

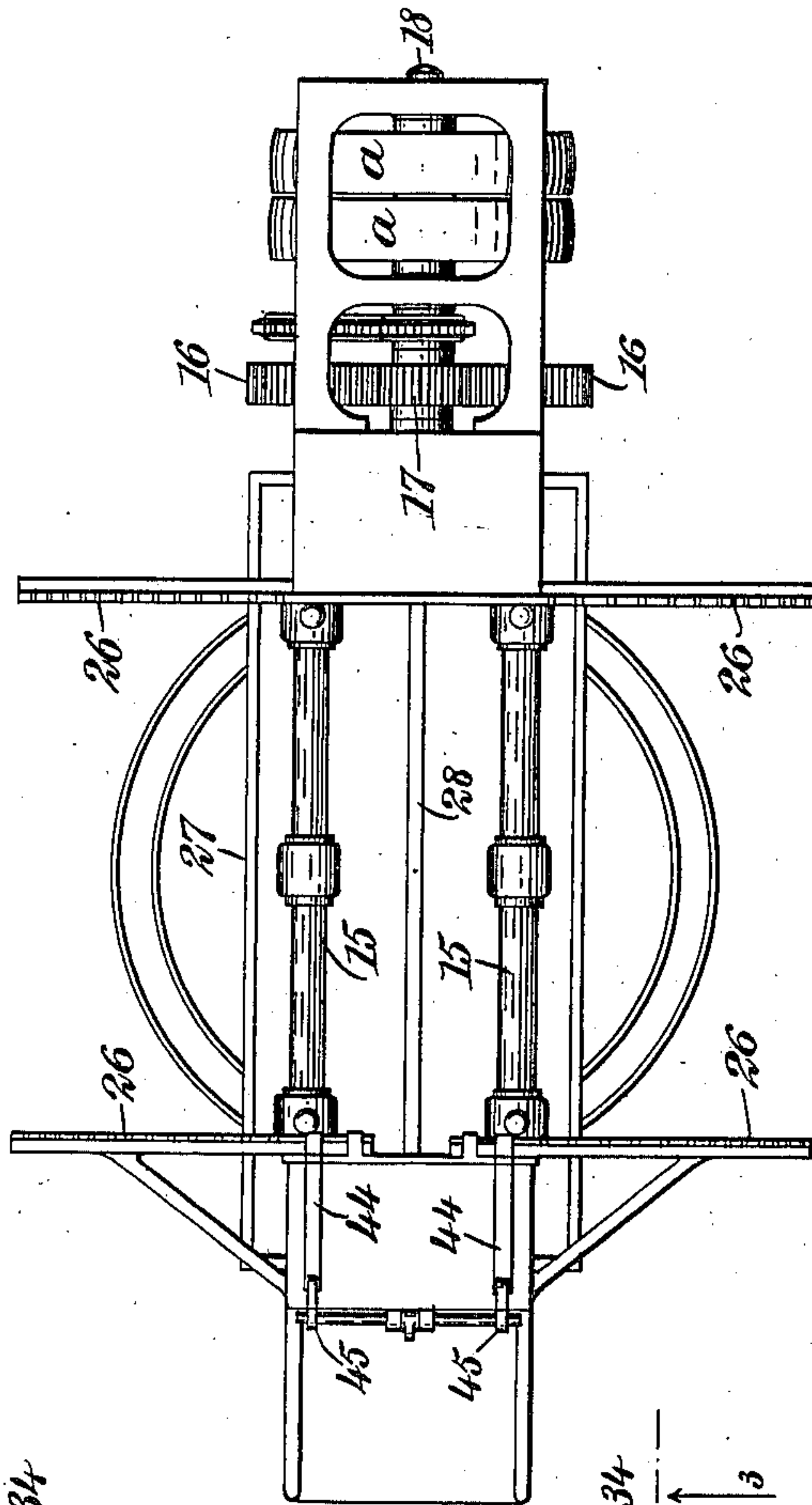


Fig. 3.

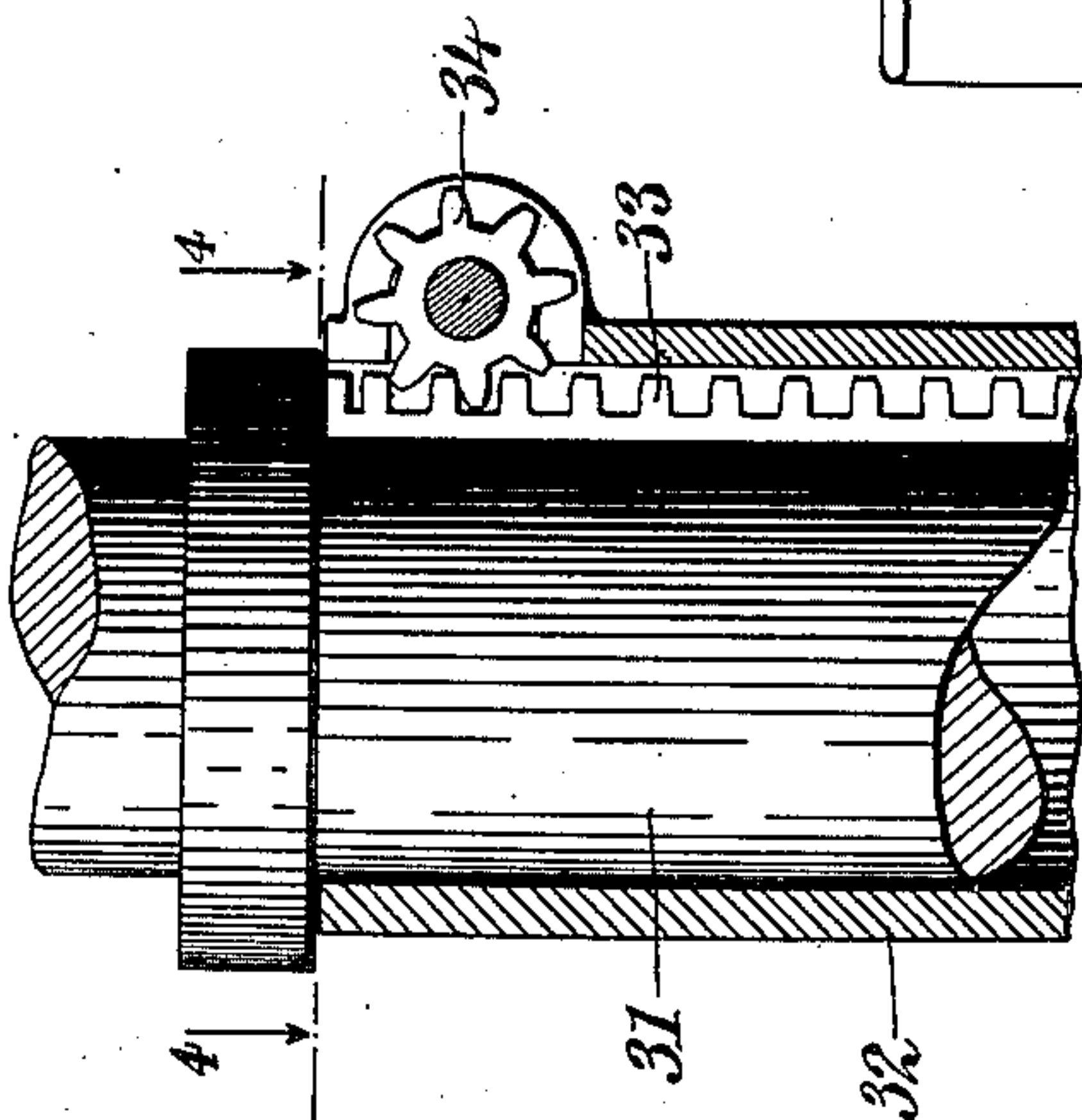
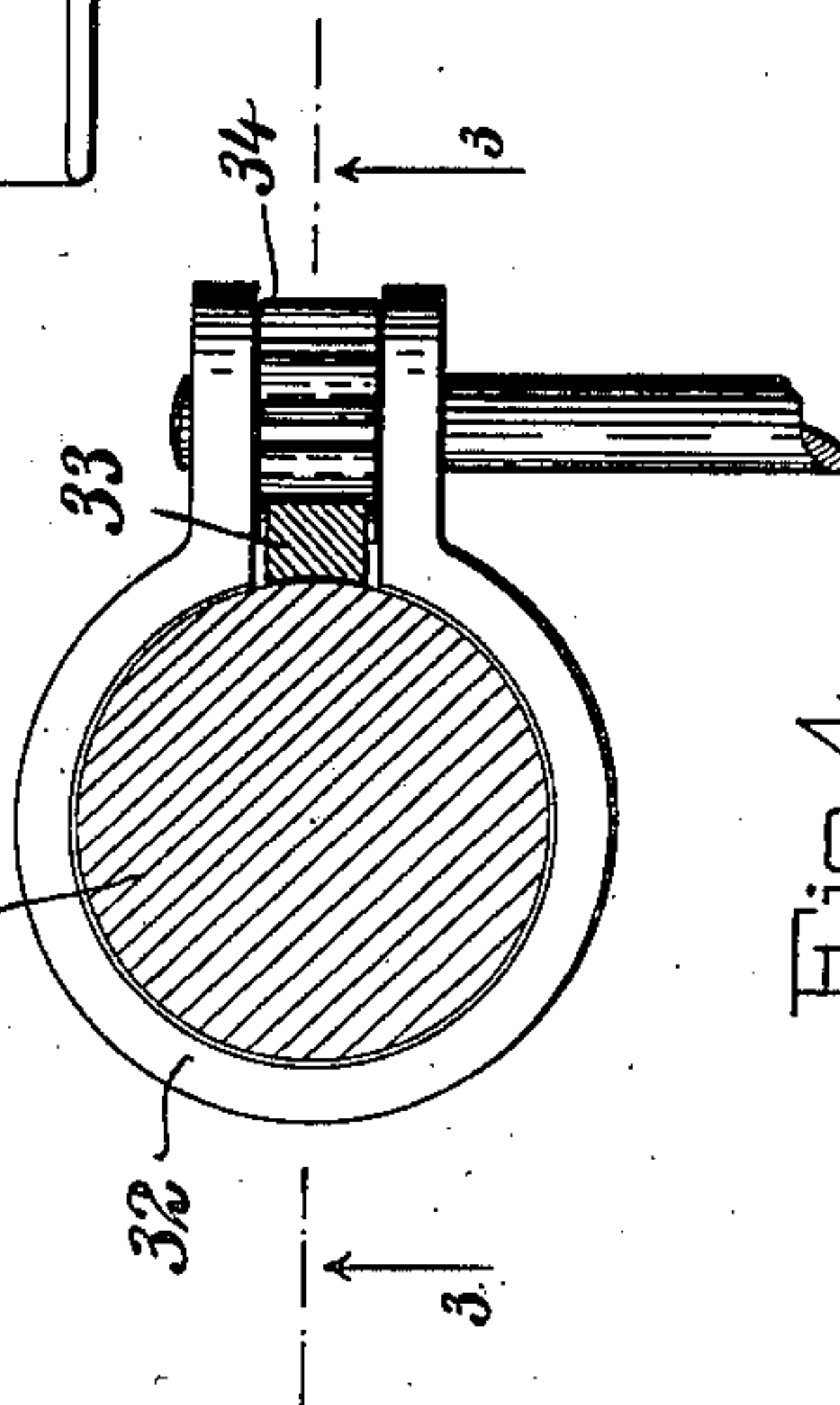


Fig. 4.



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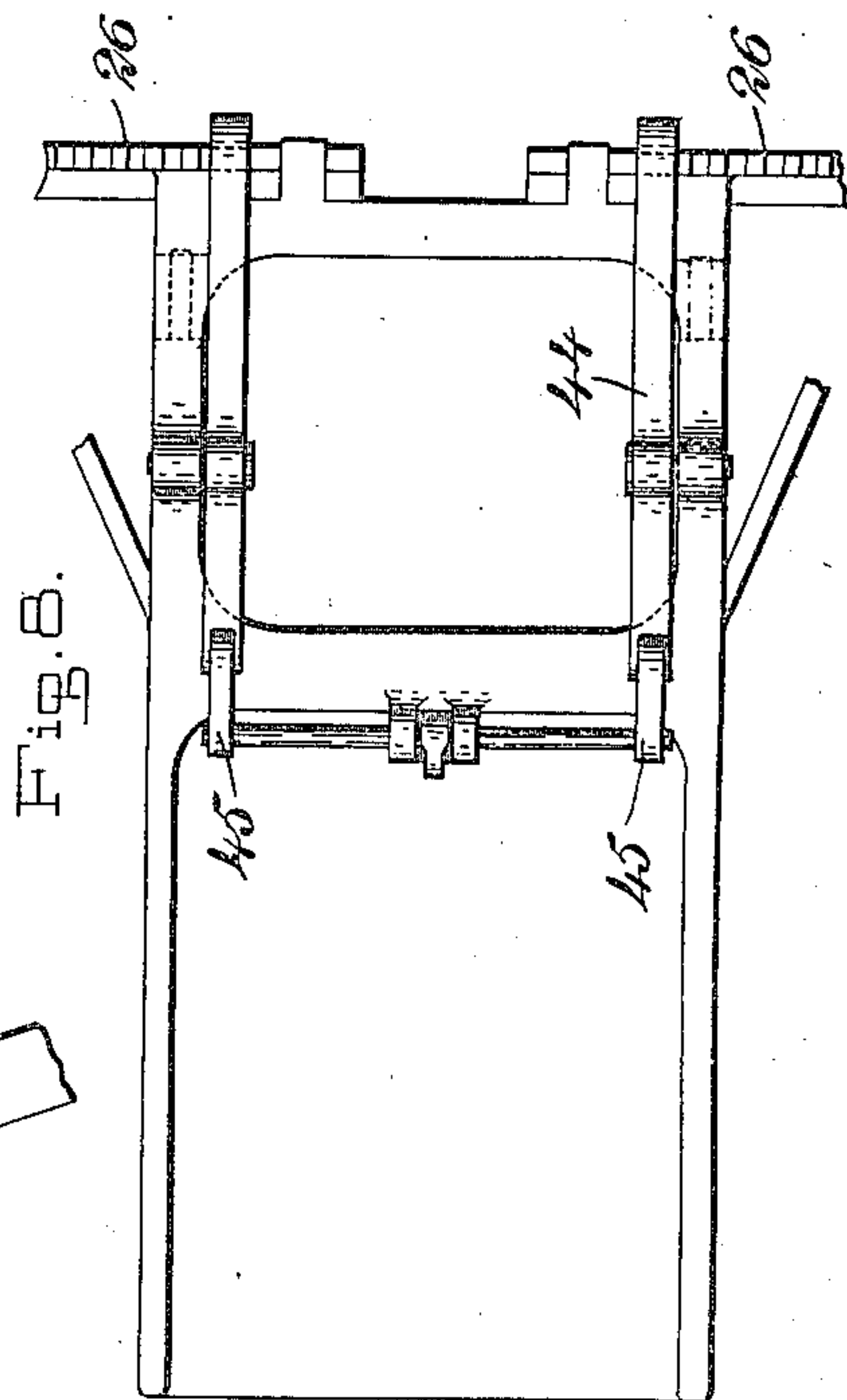
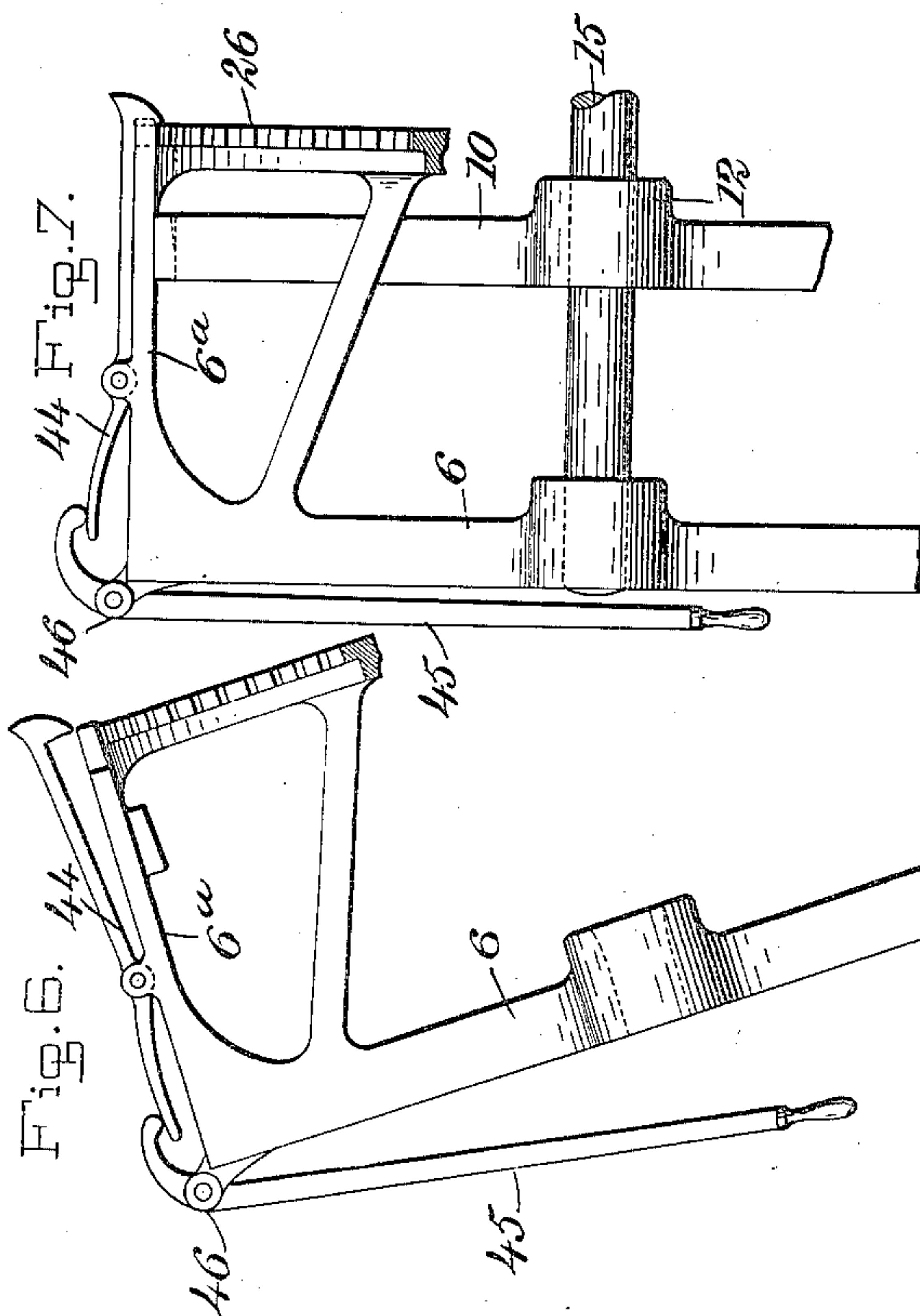
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NO MODEL.

3 SHEETS—SHEET 3.



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APPARATUS FOR TREATING YARN.

SPECIFICATION forming part of Letters Patent No. 754,784, dated March 15, 1904.

Application filed August 6, 1903. Serial No. 168,495. (No model.)

To all whom it may concern:

Be it known that I, HERMAN LINDENBERG, a citizen of the United States, and a resident of West Hoboken, in the county of Hudson and State of New Jersey, have invented new and useful Improvements in Apparatus for Treating Yarn, of which the following is a full, clear, and exact description.

The invention relates to certain novel and useful improvements in machines for treating yarn, and has particular application to an apparatus of the type referred to wherein the yarn may be subjected to a bath of any suitable chemical and subsequently immersed in a cleansing-bath.

In carrying out the present invention I have in view as an object the provision of a machine upon which the yarn to be treated is placed and held under tension while it is rotating and while subjected to a bath of suitable chemical and subsequently to a cleansing-bath.

A further object of my invention is to provide a vat or tank designed to contain the solutions in which the yarn is to be immersed, such tank being rotatably movable and vertically adjustable relative to the yarn-carrying devices of the machine.

Finally, I have in view as an object the provision of a machine which shall embody the essential and desired features of simplicity, durability, positiveness of operation, economy, and convenience.

With the above-recited objects and others of a similar nature in view my invention consists in the construction and arrangement of parts, as is described in this specification, delineated in the accompanying drawings, and set forth in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical sectional view taken through an apparatus embodying my improvements substantially on the line 1 1 of Fig. 2. Fig. 2 is a longitudinal vertical sectional view taken through my improved yarn-treating apparatus, certain portions of said

apparatus being shown in side elevation. 50
Fig. 3 is an enlarged detail view of a portion of the shaft or post designed to support the solution-containing vat, said view also illustrating the rack-and-pinion mechanism employed in elevating the vat-carrying shaft, 55
such view being taken approximately on the line 3 3 of Fig. 4. Fig. 4 is a transverse horizontal sectional view taken on the line 4 4 of Fig. 3. Fig. 5 is a top plan view of my improved apparatus. Fig. 6 is a detail view 60
of one of the movable frame members of the machine, said view illustrating the unlocked position of the aforesaid member. Fig. 7 is another view of said movable frame member, the latter being shown in its locked position 65
in engagement with a portion of the frame; and Fig. 8 is a top plan view of the movable frame members of the machine and the locking devices for the same.

As is well known, in the treatment of yarn 70
it is desirable and often necessary to subject the same to a bath of suitable chemical and subsequently wash or remove the chemical from the material by immersing the yarn in a bath of water. This process is usually extremely tedious, and in order to accomplish the same in a simple manner I have devised an apparatus which I will now proceed to describe in detail.

Referring now to the drawings in detail, 5 5 80
indicate a pair of parallel standards or frame members designed to be rigidly secured to the floor or platform, each of said members being provided at its upper end with a horizontal extension 5^a. Arranged opposite the 85
aforesaid frame members 5 5, but spaced apart some distance therefrom, so that a vat or its attachments may be interposed therebetween, are the frame members 6 6, similar in construction to the members 5, but instead 90
of being rigidly secured to the floor or platform said frame members 6 are hinged or pivoted, as at 7, so that they may be swung toward and from the members 5, and it is further to be noted that the standard or frame 95
members 6 are provided with horizontal extensions 6^a, similar to the extensions 5^a. Connected with the frame members 5 5 is an ad-

ditional supporting-frame 8, said additional frame being designed to act as a support for the power-transmitting devices of the apparatus. Depending from each of the extensions 5^a is a vertical hanger-arm 9, while adjacent to the extensions 6^a of the movable frame members 6 depend similar hanger-arms 10, said arms extending parallel with the arms 9. The hanger-arms 9 and 10 are provided centrally with enlarged bored portions 11 11 and 12 12, while the lower free ends of the arms are provided with bearing-collars 13 13 and 14 14. Extending transversely between the arms 5^a and 6^a and supported partially by the enlarged bores 11 and 12 and the arms themselves are the parallel horizontal shafts 15 15, said shafts finding bearing at one end in the additional framework 8. In order to cause the revolution of the parallel shafts 15 15, each shaft is provided at one end with a gear-wheel 16 16, said gear-wheels intermeshing with the gear-wheels 17, mounted on the relatively short power-shaft 18, which latter shaft is journaled in the framework 8 and in the cross-bar 19, extending between the extensions 5^a 5^a. Journaled in the lower ends of the hanger-arms referred to are the parallel shafts 20 20, said shafts being driven by means of endless chains 21, encircling the ends of the shafts 20 and the ends of the shafts 15, so that when said shafts 15 are rotated the shafts 20 will also receive motion.

Loosely mounted upon each of the shafts 15 are the bearing-boxes 22 22, there being a pair of such boxes for each shaft, and supported by each pair of boxes is a roll 23, which for the purpose of convenience I will hereinafter term the "tension-roll." As stated, the boxes are loosely mounted upon the shafts 15, and in order that they may be swung or oscillated upon the shafts I provide for each box a lever 24, each of said levers carrying a latch-lever 25, which is designed to engage with a toothed segment 26. It will be noted that there are four of these segments, one for each extension of the frame members, the mounting of the segments being clearly shown in Figs. 1 and 2.

From the description thus far given the manner of placing a skein or hank of yarn upon the machine will be readily apparent. One of the movable arms is swung out and the skein is lifted over the top of one of the levers 24 and placed around the shafts 15 and the shafts 20 immediately below the same, so that the loop or skein will be somewhat elliptical in form when carried by said shafts. As the machine is practically a double apparatus, two skeins may be placed upon the machine at the same time, each skein being carried by an upper shaft 15 and a lower shaft 20. In order to give the skeins the proper tension, the levers 24 are moved outward, as is shown in Fig. 1, thus swinging the tension-rollers inward to-

ward the center of the machine until such rollers press against and tension the skeins of yarn, the support for each skein consisting then of the three rollers. The levers may then be locked against movement by the latching-lever engaging with the toothed portions of the segments, and the yarn is then ready for the bath.

The chemical solution in which the yarn is immersed and the water for washing yarn are designed to be contained in a vat or tank 27, divided by the partition 28 into two compartments, one for the water and the other for the solution. This tank is provided with a number of casters or rollers 29, designed to travel in the grooved track 30 on the floor or platform, so that the tank or vat may be easily turned to bring the solution-containing compartment or the bath directly beneath a certain skein of yarn. Secured to the central bottom portion of the tank is a post 31, adapted to be movable within a supporting tubular standard 32, rigidly secured to the floor, and in order to accomplish the moving of the post within the supporting-standard I provide the former with a toothed rack 33, adapted to mesh with a gear-pinion 34, carried at one end of the horizontally-disposed shaft 35, the opposite end of said shaft finding bearing in the lower portion of the frame 8. Motion is imparted from the power-shaft 18 when the latter is driven by the belt-pulleys α and α' through the medium of the endless drive-chain 36, extending over the sprocket-wheel 37 on the shaft 18 and over the sprocket-clutch member 38, loosely mounted upon the horizontal shaft 35. The opposite member of the clutch, which I have shown at 39, has slidable engagement with the shaft 35, so that when forced into coaction, the member 38, through the medium of the pivoted lever 40, power will be given the shaft 35 to revolve the same, and the pinion 34, working over the rack 33, will cause the elevation of the vat. In order to check the vertical movement of the vat, I have provided a braking mechanism consisting of the band-pulley 41, mounted upon the shaft 35, so that the clutch member 39 is interposed between the sprocket-clutch 38 and said pulley. This clutch member 38 is so formed that it is at all times in engagement with the pulley 41, the latter turning loosely on the shaft, and its motion is checked through the medium of a band-brake 42, encircling the pulley and operated by the lever 43.

The retention of the hinged members 6 6 against movement is accomplished by the following devices: Pivotaly mounted upon each extension 6^a is a latch 44, adapted to engage with the adjacent top portion of one of the hanger-arms 10, and each of said latches is held against movement by a locking-bar 45, pivoted, as at 46, to the top portion of the frame member. For the purpose of acting as a stop for the tension-rollers I have supported,

through the medium of each pair of shafts 15 and 20, a central bracket 47, said bracket having a curved enlargement 48, formed intermediate of its length, in which the roll 23 is designed to seat when in its normal non-tensioning position.

From the drawings it will be seen that it is only necessary to move the locking-bar, thereby releasing the latch and permitting the arm to be swung upon the pivot 7 outward from the apparatus, so that the yarn will be readily passed over the hanger-arm and tension-roll lever onto the yarn-carrying shafts. It is further seen that when the frame members are swung outward the toothed segment-sections 26 26, secured to the members, are of course swung outward therewith, this arrangement being formed in order that no obstruction may be met with in passing the yarn over the levers and upon the shafts.

From the above description, taken in connection with the accompanying drawings, the construction and operation of the entire apparatus will be readily apparent. The skein of yarn to be treated is slipped over the levers and upon the shaft after the frame members have been unlocked, and said members are then moved back into position and locked to the adjacent vertical hanger-arms. The tension-shafts are then moved inward toward the center of the machine by actuating the levers 24 until the yarn is held at the desired tension. The tank is then elevated by the mechanism hereinbefore described until the skeins of yarn are entirely submerged, one skein being subjected to the chemical bath, while the opposite skein is immersed in the water-bath. The tank may then be turned and the skein previously subjected to the chemical is submerged in the water, the shafts in the meantime imparting rotary motion to the train of power devices in order to cause the skein to travel over the same, so that the yarn will be thoroughly treated. The tank may be lowered after the treatment has been completed and the skeins removed therefrom and new ones substituted.

From the above description it will be seen that the yarn receives thorough treatment, and the operation consumes but little time when compared with the methods now in use. It will also be noted that with a machine of this character the hanks or skeins of yarn may be placed upon and removed without stopping the machine. This is a great advantage, as it enables the work to be accomplished with the least possible delay.

While I have shown and herein described one particular embodiment of my invention, it is of course to be understood that I do not limit myself to the precise details of construction shown herein, as there may be modifications and variations in certain respects without departing from the essential features of

the invention or sacrificing any of the advantages thereof.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination with a frame including a side member hinged at its lower portion, of yarn-supporting shafts journaled in said frame, a plurality of bearing-collars loose on said shafts, means carried by said collars for tensioning the yarn upon the yarn-supporting shafts, and a solution-containing vat mounted beneath the shafts.

2. The combination of yarn-supporting means including a plurality of shafts, a tensioning device suspended from one of said shafts, a bracket in which the tensioning device rests when in its inoperative position, a solution-containing vat mounted beneath the yarn-supporting shafts, and means for moving said vat relative to said shafts.

3. The combination of a frame including a hinged side member, yarn-supporting means carried by said frame, a vat mounted beneath the yarn-supporting means, and means for adjusting said vat vertically relatively to the yarn-supporting means.

4. The combination of a frame, including a hinged side member, yarn-supporting means including an upper shaft and a lower shaft, a tension-roll movably suspended from the upper shaft, a rotatable solution-containing vat mounted adjacent to the shafts and roll, and means for adjusting said vat vertically relatively to the yarn-supporting shafts, substantially as set forth.

5. The combination of a frame including a movable member, yarn-supporting means carried by said frame, a solution-containing vat arranged adjacent to the yarn-supporting means, a yarn-tensioning device movably suspended from the yarn-supporting means, and means for locking the tensioning device in a desired position of adjustment.

6. The combination of a frame, yarn-supporting shafts journaled therein, a tensioning device for the yarn supported from one of the shafts, and means including a segment and a latching device engaging with said segment for locking and holding the tensioning device in a position of adjustment.

7. The combination of a main frame, including a movable side member, yarn-supporting means carried by the frame, a tensioning device for the yarn, a rotatable solution-containing vat mounted adjacent to the yarn-supporting means, and power-transmitting devices, including a rack-and-pinion mechanism for moving said vat vertically relatively to the yarn-supporting means.

8. The combination with yarn-supporting means, of a tensioning device for the yarn, including a roll and means for oscillating said roll relatively to the yarn-supporting means, a receptacle designed to contain solutions for

treating the yarn, mounted adjacent to the supporting and tensioning means, means including a rack-and-pinion mechanism for moving the receptacle relatively to the yarn-supporting means, and a brake mechanism for checking the movement of the receptacle, substantially as set forth.

9. The combination of a frame including a movable member, yarn-supporting means carried by said frame and means for locking the movable member stationary relatively to the yarn-supporting means, such locking means including a latch carried by the movable member and designed to engage with the stationary portion of the machine, and a locking-lever engaging with said latch, substantially as set forth.

10. The combination of a frame, a plurality of rotatable yarn-supporting shafts carried thereby, collars loosely mounted on one of said shafts, a tensioning device, including a roll supported in said collars, and means including a locking-lever and a toothed segment designed to be engaged by the lever for adjusting the tensioning devices.

11. The combination of a frame, a yarn-supporting shaft, bearing-collars loose on said shaft, a lever connected to each of said collars for moving the latter, and a roll carried by said collars.

12. The combination of a frame, a yarn-supporting shaft, bearing-collars loose on said shaft, a roll carried by the collars, means for rocking the collars upon the shaft, and means for locking the collars with their roll in any position to which they may be rocked.

13. The combination of a yarn-supporting shaft, a tension-roll, a rocking connection between the shaft and the roll, and a lever for rocking the connection.

14. The combination of a plurality of yarn-supporting shafts spaced apart, a bracket connecting said shafts, said bracket having an enlarged recessed portion, and a movable yarn-tensioning device designed when in its normal inoperative position to seat in the recessed portion of the bracket.

15. The combination of a frame, vertically-depending hanger-arms carried by said frame, yarn-supporting shafts carried by said arms, a yarn-tensioning roll movably connected to one of said shafts, a bearing-bracket for said roll, and means for locking the roll against movement when in its operative position.

16. The combination of a frame, including a movable member and a stationary portion, hanger-arms, yarn-supporting means journaled in said arms, and means for locking the movable frame member to an adjacent hanger-arm, substantially as set forth.

17. The combination of a frame, a toothed segmental rack carried by said frame, yarn-supporting means, a movable yarn-tensioning device, and means operated by the yarn-tensioning device and adapted to engage with the rack for locking said device against movement.

18. The combination of a frame, yarn-supporting means, a yarn-tensioning roll movable relatively to the yarn-supporting means, a lever for moving said roll, and means including a segmental rack and a locking-detent for holding the tensioning-roll against movement.

19. The combination of a frame, including a stationary portion and a movable member, a plurality of hanger-arms, yarn-supporting shafts carried by said arms, and means for locking the movable member to certain of said arms.

20. In a machine for treating yarn or the like, a plurality of yarn-supporting shafts spaced apart, and a tensioning-roll designed to be rocked in a path lying between the yarn-shafts, substantially as set forth.

21. The combination of a frame, including a stationary portion and a hinged member, yarn-supporting means carried by said frame, a rotatable vertically-movable vat arranged beneath the yarn-supporting means, and a brake mechanism for checking the movement of the vat.

22. The combination of a frame, a plurality of rotatable yarn-supporting shafts, means for imparting a rotary motion to one of said shafts, means for transferring the motion to a second of the yarn-supporting shafts, a rotatable vat mounted beneath the yarn-supporting shafts, means for moving said vat vertically, and a brake mechanism for checking the movement of the vat, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HERMAN LINDENBERG.

Witnesses:

RICHARD B. CAVANAGH,
JNO. M. RITTER.