H. HENNIG.

DYEING, WASHING, AND STRIPPING MACHINE.

APPLICATION FILED AUG. 10, 1907.

901,003.

Patented Oct. 13, 1908.

4 SHEETS—SHEET 1.

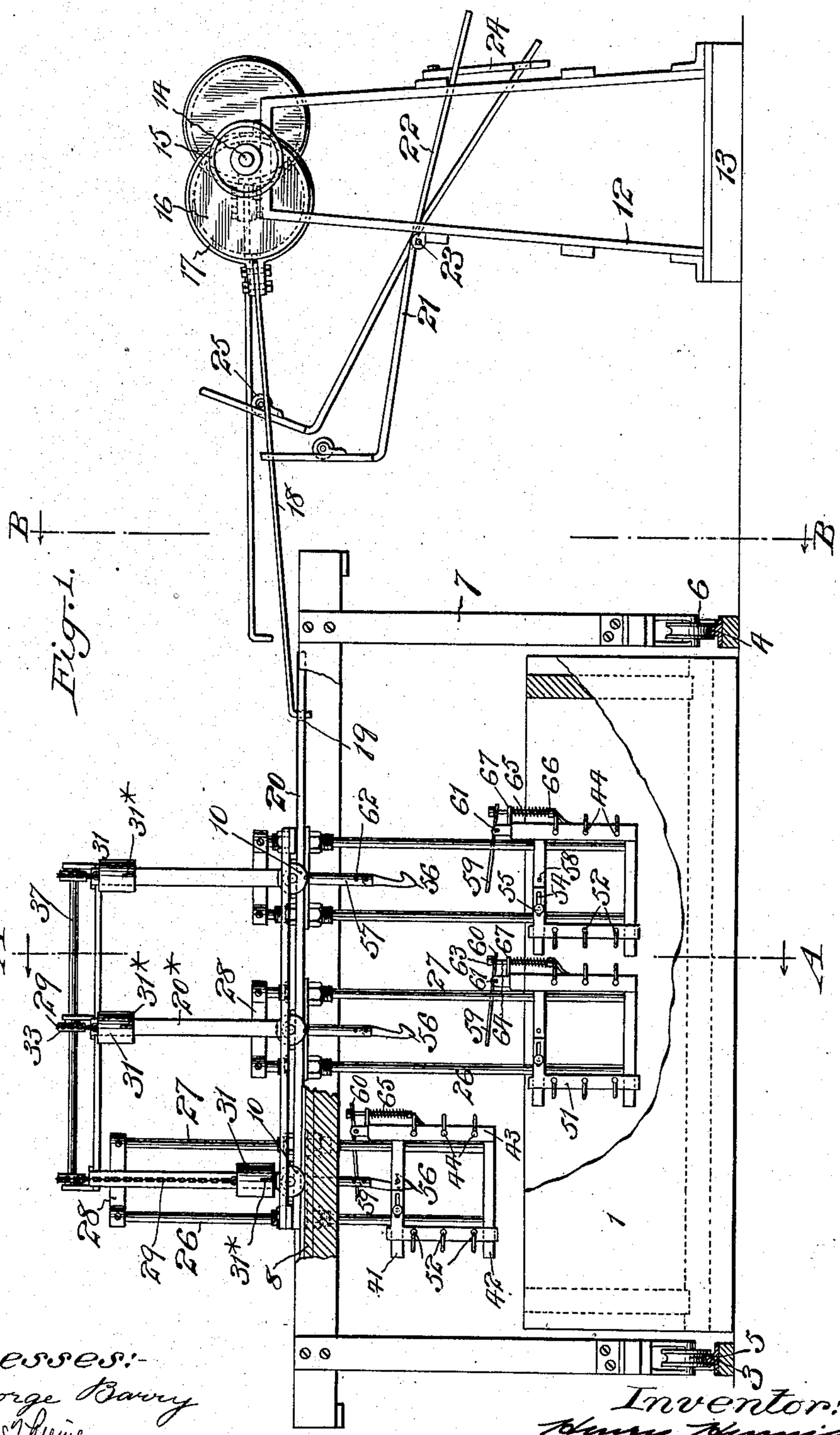

Fig. 1.

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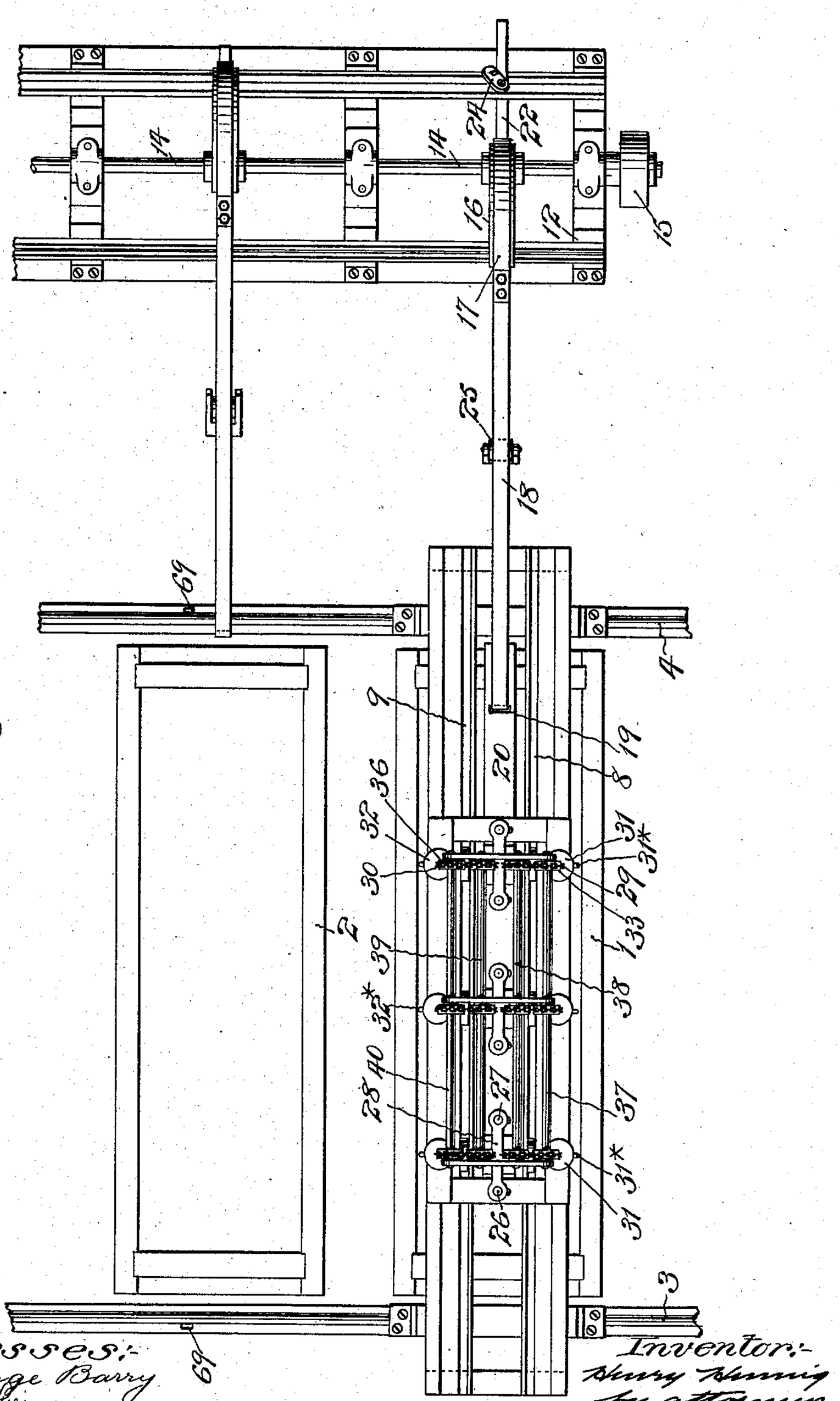
4 SHEETS—SHEET 2.

Fig. 2.



Witnesses:-
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4 SHEETS—SHEET 3.

Fig. 4.

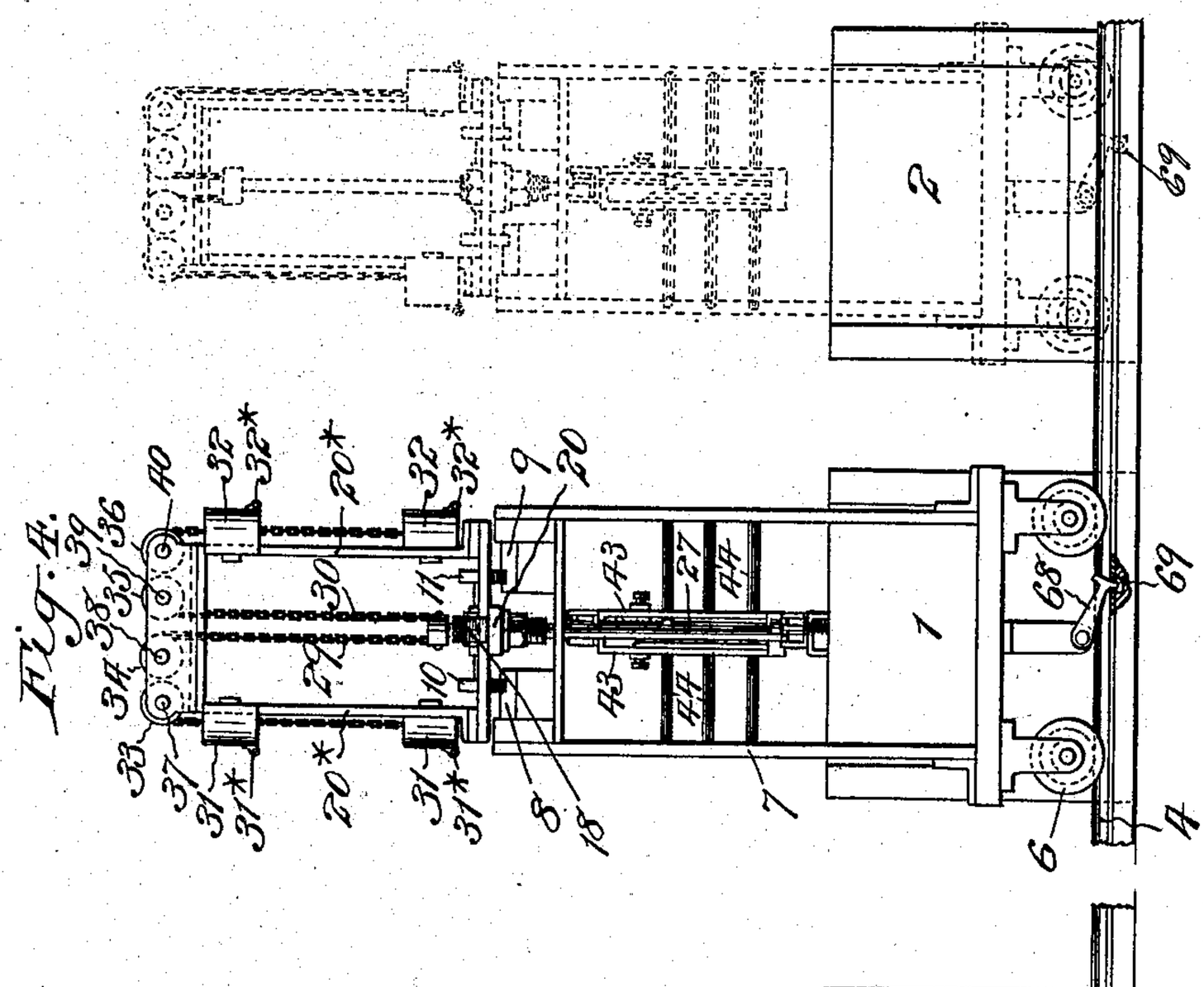
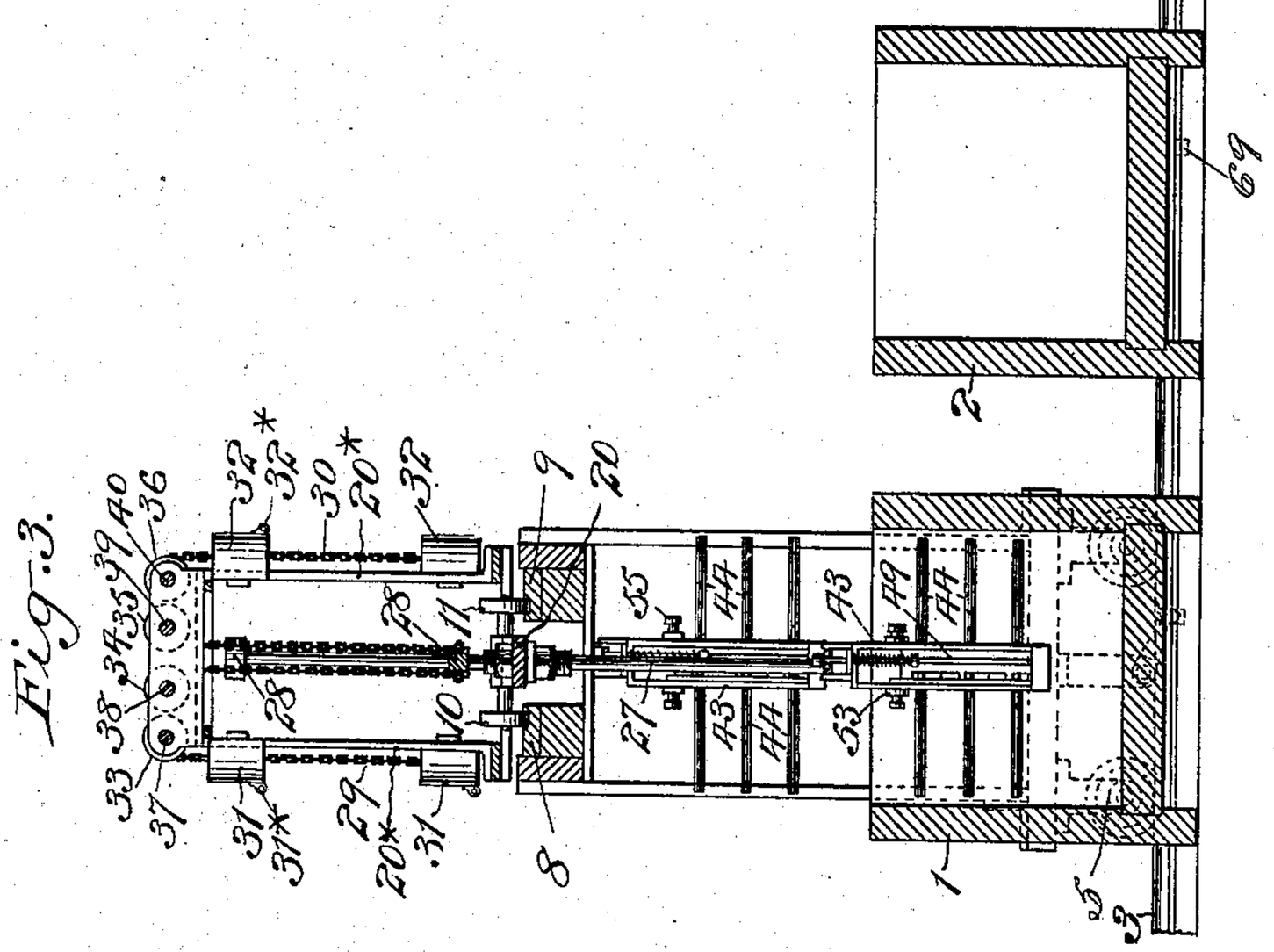


Fig. 3.



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4 SHEETS—SHEET 4.

Fig. 9.

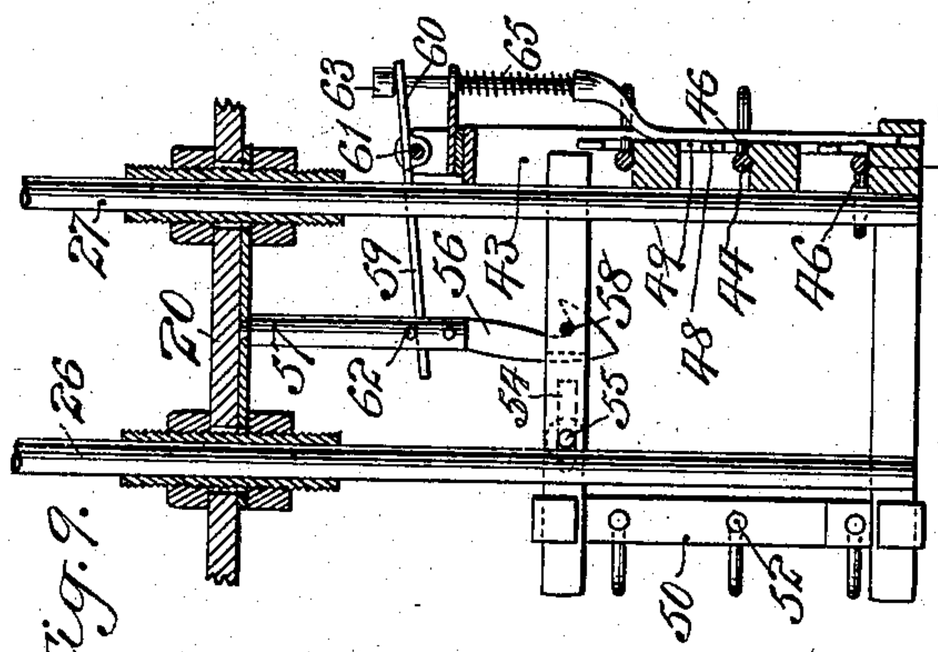


Fig. 10.

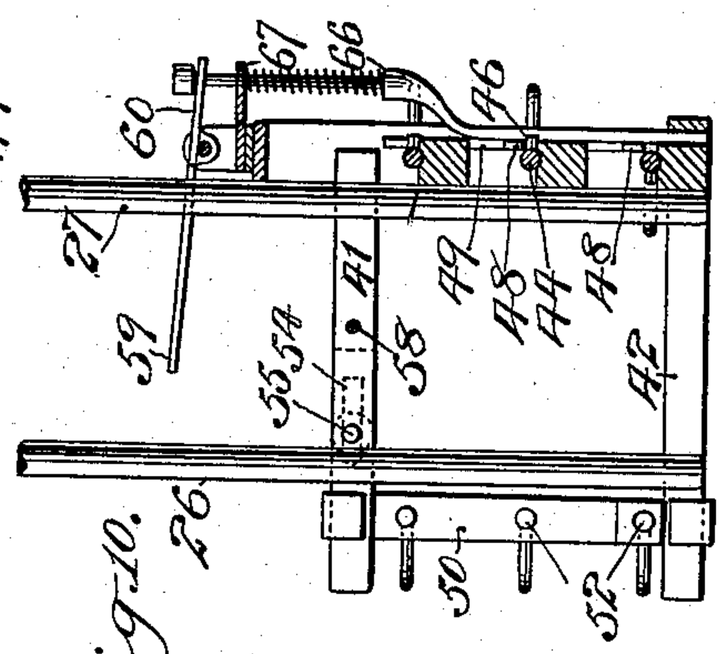


Fig. 8.

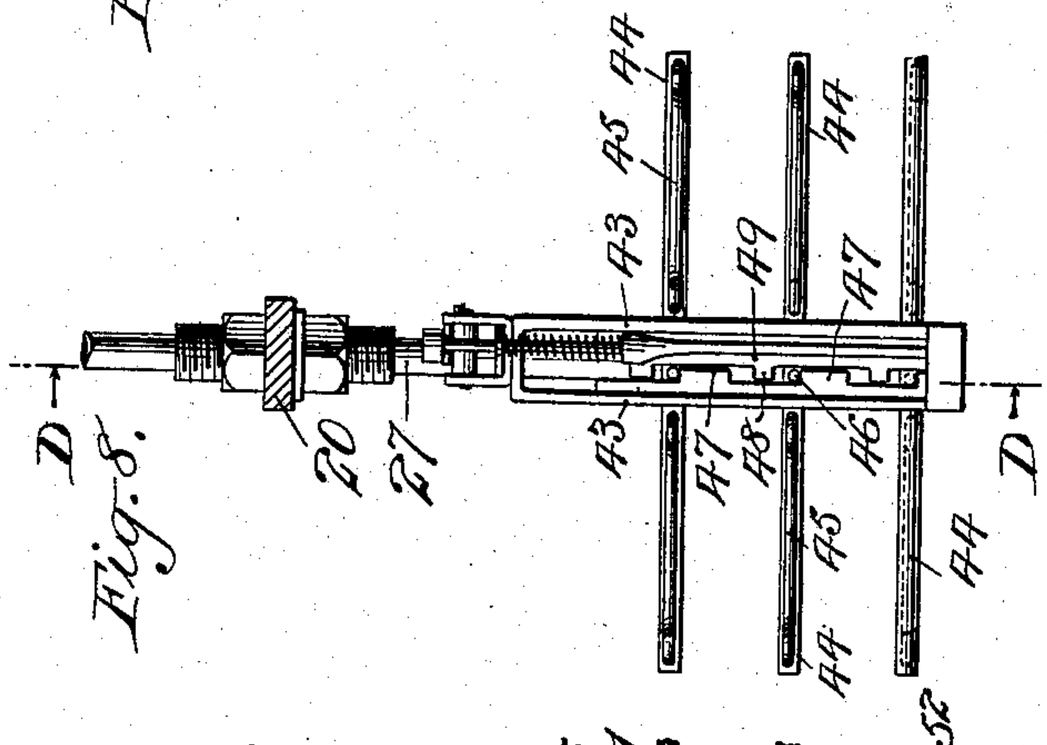


Fig. 12.

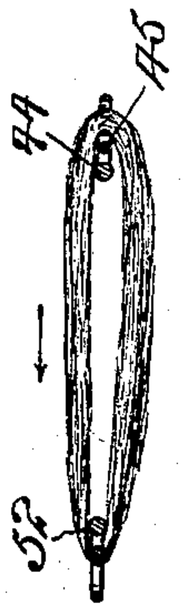


Fig. 13.

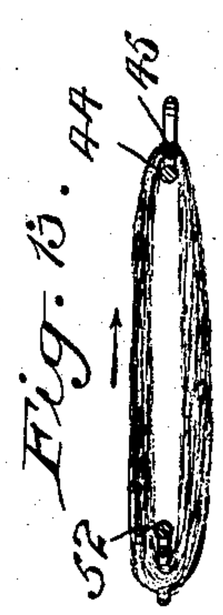


Fig. 7.

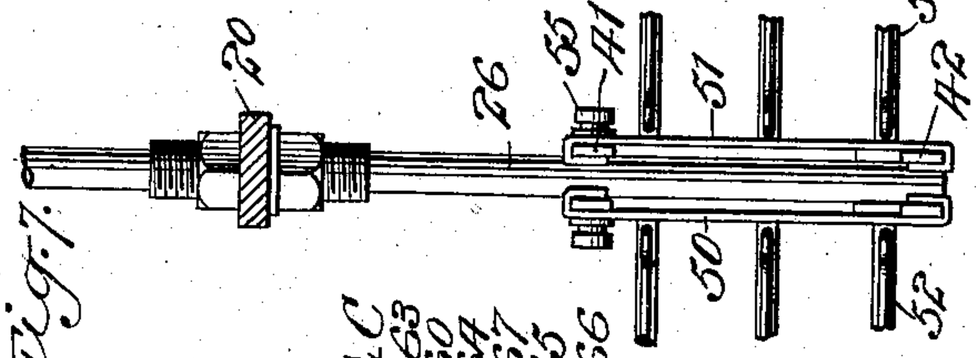


Fig. 11.

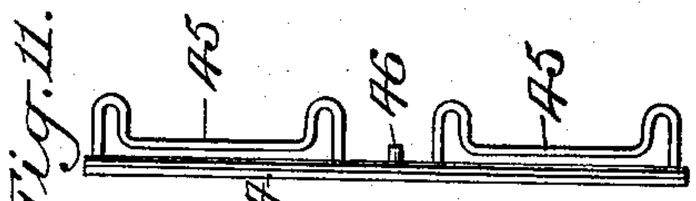


Fig. 5.

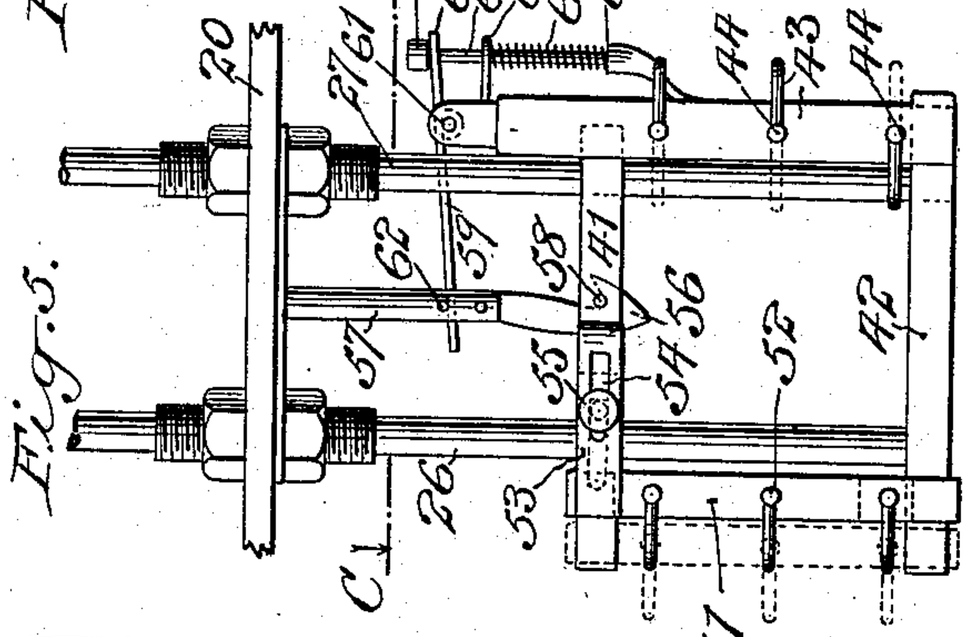
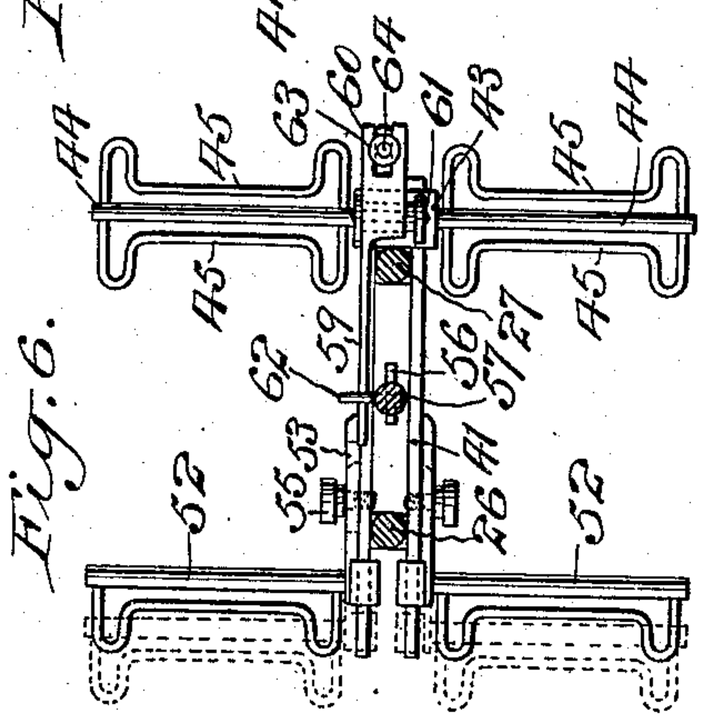


Fig. 6.



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UNITED STATES PATENT OFFICE.

HENRY HENNIG, OF PATERSON, NEW JERSEY.

DYEING, WASHING, AND STRIPPING MACHINE.

No. 901,003. Specification of Letters Patent. Patented Oct. 13, 1908.

Application filed August 10, 1907. Serial No. 387,975.

To all whom it may concern:

Be it known that I, HENRY HENNIG, a citizen of the United States, and resident of Paterson, in the county of Passaic and State of New Jersey, have invented a new and useful Improvement in Dyeing, Washing, and Stripping Machines, of which the following is a specification.

The objects of my present invention are to provide a machine in which the several parts are so constructed, arranged and operated that any desired number of skeins of yarn may be treated effectually; in which skeins of various lengths may be treated simultaneously; in which the skeins may be readily inserted into and removed from various tanks in a very simple manner; in which certain of the skeins may be taken off or put on the machine without stopping the machine; and in which the machine may be used for dyeing the yarn, for stripping the yarn and for washing the yarn when dyed or stripped, without removing the yarn from the machine.

A practical embodiment of my invention is represented in the accompanying drawings in which

Figure 1 represents the machine in side elevation, the side of one of the tanks being shown broken away to show two of the skein carrying sections of the yarn frame in their lowered position, a third section being shown in its raised position, a portion of the yarn frame support also being broken away to more clearly show the parts for imparting the longitudinal reciprocating movement to the frame irrespective of the position of its skein carrying sections; Fig. 2 is a top plan view of the machine showing two tanks and two yarn frame reciprocating devices; Fig. 3 is a vertical transverse section taken in the plane of the line A—A of Fig. 1, looking in the direction of the arrows; Fig. 4 is a vertical transverse section taken in the plane of the line B—B of Fig. 1, looking in the direction of the arrows, the yarn frame and its transversely moving support being shown in dotted lines in the position which they would assume in connection with the second tank; Fig. 5 is an enlarged detail side view of one of the skein carrying sections of the yarn frame; Fig. 6 is a transverse section taken in the plane of the line C—C of Fig. 5, looking in the direction of the arrows; Fig. 7 is a detail view of one end of the skein carrying section; Fig. 8 is a detail view of the other end of the skein carrying section; Fig. 9 is a transverse section taken in the plane of the line D—D of Fig. 8, looking in the direction of the arrows; Fig. 10 is a similar view with the skein carrying section shown in its lowered position; Fig. 11 is a detail view of one of the double eccentric skein carrying pins, and Figs. 12 and 13 are detail views illustrating the fact that the skein of yarn hugs the forward pin when moving and is free to open on the rear pin, thus allowing the liquor to pass through all parts of the skein during the reciprocation of the skein in the tank.

A plurality of tanks suitable for the treatment of the yarn are provided, which tanks may be of any desired length and width to suit different requirements. In the present instance I have shown two tanks 1 and 2, arranged side by side. Track rails 3, 4, are located transversely to the tanks along the opposite ends thereof, on which rails the traction wheels 5, 6, of the yarn frame support 7 are free to travel. This yarn frame support comprises a suitable skeleton framework, certain of the longitudinal top girders of which are provided with track rails 8, 9, along which the traction wheels 10, 11 of the yarn frame are fitted to travel longitudinally of the tanks as the yarn frame is reciprocated. This yarn frame has a plurality of skein carrying sections which may be independently raised and lowered as will hereinafter more fully appear. In the present instance I have shown the frame as having three of these sections.

A separate device for imparting the longitudinal reciprocations to the yarn frame is provided in alinement with each tank. Each of these reciprocating devices is constructed, arranged and operated as follows. A frame 12 uprises from a suitable base 13, in which frame there is mounted a rotary horizontal shaft 14 arranged transversely to the tanks 1 and 2, which shaft is provided with a pulley 15 driven from any suitable source of power, not shown herein. An eccentric 16 is fixed to rotate on the shaft 14 in alinement with each of the tanks, which eccentric is provided with a strap 17 carrying a longitudinally extended hook bar 18 the end of which is fitted to removably enter a slot 19 in a longitudinal bar 20 of the yarn frame. A two armed lever 21, 22, is pivoted at 23

on the frame 12 and is arranged to control the engagement and disengagement of the bars 18 and 20 as follows. When the arm 21 of the lever 21, 22, is in its lowered position, the bar 18 will be caused to be engaged with the bar 20. When the arm 21 of the said lever is raised it will lift the bar 18 above the bar 20 and a latch 24 is provided for engaging the arm 22 of the lever to hold the bar 18 in its raised position. To eliminate friction as far as possible, while the bar 18 is held in its raised position, I provide the arm 21 of the said lever with an antifriction roller 25 on which the bar 18 may reciprocate as the shaft 14 rotates.

Each of the skein carrying sections of the yarn frame is constructed, arranged and operated as follows: Two parallel rods 26, 27, are fitted to slide vertically through the bar 20 of the yarn frame. The upper ends of these rods are connected by a cross-piece 28 to which are attached the flexible connections 29, 30 of two counterbalance weights 31, 32. These flexible connections pass over suitable idler pulleys 33, 34 and 35, 36, loosely mounted on longitudinal shafts 37, 38, 39, 40 carried by the yarn frame. These shafts serve as supports for the idler pulleys of the counterbalance devices of all of the frame sections. These weights 31, 32, are guided in their movements on the vertical bars 20* of the yarn frame and are also provided with eyes 31*, 32*, for the attachment of devices in the hands of the operator for raising and lowering the skein carrying sections.

Each frame section is provided with means for carrying a plurality of skeins of yarn in a horizontal direction upon both sides of the bars 26, 27, as follows. Upper and lower parallel bars 41, 42 are secured to the rods 26, 27, on each side thereof. Vertical side plates 43 are secured to the upper and lower cross bars 41, 42, adjacent to the vertical rod 27, through which side plates the vertical series of eccentric double yarn carrying pins 44 extend, which pins project outwardly upon opposite sides of the rod 27. Each of these pins is arranged to be turned a half revolution when released for bringing the eccentric portions 45 of the pin into an extended or withdrawn position at pleasure. Each pin 44 is provided with a lug 46 which is held between a stop 47 on one of the side plates 43 and a stop 48 on a spring actuated sliding latch plate 49 when the latch plate is in its released or lowered position and the eccentric portion of the pin is in its extended position.

Independently adjustable side plates 50, 51, are engaged with the upper and lower cross bars 41, 42, which side plates have yarn carrying pins 52 projecting outwardly therefrom and corresponding in number with the rocking yarn carrying pins 44. These side plates 50, 51, are made adjustable by providing each plate with a rearwardly extended arm 53 having an elongated slot 54 therein through which a set screw 55 passes into engagement with the cross bar 41. By this means the pins on the side plate 50 may be adjusted toward and away from their corresponding pins 44 independently of the adjustments of the pins projecting from the side plate 51 toward and away from their corresponding pins 44, thus permitting the carrying of skeins of one length upon one side of the section and skeins of another length on the other side of the section.

A swinging hook 56 hangs from a depending post 57 fixed to the bar 20 of the yarn frame, which hook is arranged to engage a pin 58 extending between the upper parallel bars 41 when the skein carrying pins are in their raised position. When the pins are in the said raised position, the rocking pins 44 are released to permit their eccentric portions 45 to be swung into their withdrawn position to permit the removal and insertion of the skeins, as follows. A two-armed lever 59, 60, is pivoted at 61 in such position that its arm 59 will be depressed by a laterally extended pin 62 on the post 57 and its arm 60 will be raised, thus lifting the slide 49 by the engagement of the said arm with the head 63 of an extension 64 of said slide 49. The spring 65 for normally holding the slide 49 closed is interposed between a shoulder 66 on the said slide and a guide 67 for the extension 64. The yarn frame support is locked against movement when adjusted into position to bring the yarn frame over the desired tank. The locking means which I have shown for accomplishing this result comprises a swinging dog 68 arranged to be removably engaged with a recess 69 adjacent to each tank.

Proceeding to describe the operation of my machine: The yarn frame support 7 is moved transversely to the tanks until the yarn frame is brought directly over one of the tanks. The pairs of yarn carrying pins of the different sections of the yarn frame are supposed to be held in their raised position by the hooks 56. The skeins of yarn may be readily inserted into position over their pairs of pins while the pins 44 are turned inwardly. The pins 52 of each section are adjusted to the length of the skein being carried. The pins 44 are then turned to bring their eccentric portions 45 into their outer or extended position. The group of pins of each section are then released from the hook 56 and the sections are lowered into the tank. The reciprocating device in alinement with the tank in which the yarn is being immersed is brought into operative engagement with the yarn

frame and the frame is thus reciprocated with the skeins of yarn held in a horizontal position completely immersed in the liquor.

As the skeins are moved back and forth within the tank in their horizontal position, it will be seen that the skein will first hug one pin 52 when going in one direction and loosen itself from the other pin 44 and will then hug the eccentric portion 45 of the pin 44 when moving in the opposite direction and loosen itself from the pin 52. This will insure the thorough treatment of the skein by the liquor.

After the several skeins on the frame have been properly treated in one tank, the sections may be raised and the reciprocating device disengaged from the frame. The frame support may then be moved transversely to bring the frame over another tank. The driving device for the frame in alinement with such last named tank is then brought into operative engagement with the frame. The sections may be lowered into the said tank and the reciprocating operation repeated.

It will be seen that in a machine constructed, arranged and operated as herein set forth, a thorough treatment of the yarn may be provided for, and any particular skein carrying section may be raised or lowered without interfering with the other sections of the frame. It will also be seen that very simple and effective means are provided for inserting and removing the skeins and for providing for skeins of different lengths. It will also be seen that a very efficient means is provided for shifting the yarn from one tank to another and for lowering and raising the yarn into and out of its liquor.

While I have shown my apparatus as being provided with three sections, it is to be understood that any number of sections may be provided; also that each section may be provided with means for carrying any number of skeins of yarn.

While the machine herein shown and described is particularly well adapted for use in the treatment of silk yarn, it is to be understood that I do not confine myself to such use as the said machine may be used in connection with woolen, cotton or other yarns.

It is also evident that various changes might be resorted to in the construction, form and arrangement of the several parts without departing from the spirit and scope of my invention; hence I do not wish to limit myself strictly to the structure herein set forth, but

What I claim is:

1. In a machine of the character described, a tank, a yarn frame support movable transversely to the tank and a yarn frame movable lengthwise of the tank on the said support.

2. In a machine of the character described, a plurality of tanks, a yarn frame support movable transversely to the tanks and a yarn frame movable lengthwise of the tanks on the said support.

3. In a machine of the character described, a tank, a yarn frame support movable transversely to the tank and a yarn frame having a plurality of skein carrying sections, the said yarn frame being movable lengthwise of the tank on the said support.

4. In a machine of the character described, a plurality of tanks, a yarn frame support movable transversely to the tanks and a yarn frame having a plurality of skein carrying sections, said frame being movable lengthwise of the tanks on the said support.

5. In a machine of the character described, a tank, a yarn frame support movable transversely to the tank, a yarn frame movable lengthwise of the tank on the said support and a yarn frame reciprocating device detachably connected to said yarn frame.

6. In a machine of the character described, a plurality of tanks, a yarn frame support movable transversely to the tanks, a yarn frame movable lengthwise of the tanks on the said support, and a plurality of yarn frame reciprocating devices one for each tank, arranged to be detachably connected to the said yarn frame.

7. In a machine of the character described, a tank, a yarn frame support and a yarn frame having a plurality of skein carrying sections fitted to be independently lowered into and raised from said tank.

8. In a machine of the character described, a tank, a yarn frame support, a yarn frame having a plurality of skein carrying sections fitted to be independently lowered into and raised from the tank and means for reciprocating the yarn frame on its support.

9. In a machine of the character described, a plurality of tanks, a yarn frame support movable transversely to the tanks and a yarn frame having a plurality of skein carrying sections fitted to be independently lowered into and raised from the tanks.

10. In a machine of the character described, a plurality of tanks, a yarn frame support movable transversely to the tanks, a yarn frame having a plurality of skein carrying sections fitted to be independently lowered into and raised from the tanks and means for reciprocating the yarn frame on its support.

11. In a machine of the character described, a plurality of tanks, a yarn frame support movable transversely to the tanks, a yarn frame having a plurality of skein carrying sections fitted to be independently lowered into and raised from the tanks and a plurality of yarn frame reciprocating devices one for each tank arranged to be detachably connected to the yarn frame.

12. In a machine of the character de-

scribed, a tank, a yarn frame support movable transversely to the tank, a yarn frame movable lengthwise of the tank on the said support and means for locking the yarn frame support in position.

13. In a machine of the character described, a plurality of tanks, a yarn frame support movable transversely to the tanks, a yarn frame movable lengthwise of the tanks on the said support and means for locking the yarn frame support in alinement with any one of the tanks.

14. In a machine of the character described, a tank, and a yarn frame arranged to carry the skeins in a horizontal position within the tank.

15. In a machine of the character described, a tank, a yarn frame arranged to carry the skeins in a horizontal position within the tank and means for reciprocating the frame.

16. In a machine of the character described, a tank, a yarn frame arranged to carry the skeins horizontally and means for reciprocating the frame in a direction to move the skeins longitudinally within the tank while in their horizontal position.

17. In a machine of the character described, a tank, a yarn frame having a plurality of skein carrying sections fitted to be independently lowered into and raised from the tank and arranged to carry the skeins in a horizontal position.

18. In a machine of the character described, a tank, a yarn frame having a plurality of skein carrying sections fitted to be independently lowered into and raised from the tank and arranged to carry the skeins in a horizontal position and means for reciprocating the frame in a direction to move the skeins longitudinally within the tank while in their horizontal position.

19. In a machine of the character described, a plurality of tanks, a yarn frame support movable transversely to the tanks and a yarn frame movable lengthwise of the tanks on said support, said frame having a plurality of skein carrying sections fitted to be independently lowered into and raised from the tanks and arranged to carry the skeins horizontally within the tanks and means for reciprocating the frame in a direction to move the skeins longitudinally within the tanks while in their horizontal position.

20. In a machine of the character described, a skein carrying section comprising pairs of pins upon opposite sides one pin of a pair on each side of the section being independently adjustable toward and away from the other pin of the pair for holding skeins of different lengths on said section.

21. In a machine of the character described, a skein carrying section comprising a plurality of pairs of pins upon each side of the section the corresponding pins of the several pairs upon each side of the section being adjustable toward and away from the other pins of the pair for holding skeins of different lengths upon opposite sides of the said section.

22. In a machine of the character described, a skein carrying section comprising a pair of pins one of which has an eccentric portion arranged to be swung into a withdrawn position to permit the insertion and removal of the skein and into an extended position for the retention of the skein.

23. In a machine of the character described, a skein carrying section comprising a plurality of pairs of pins one pin of each pair having an eccentric portion arranged to be swung into a withdrawn position to permit the insertion and removal of the skein and into an extended position for the retention of the skein.

24. In a machine of the character described, a skein carrying section comprising pairs of pins projecting upon opposite sides of the section, one pin of a pair on each side of the section having an eccentric portion arranged to be swung into a withdrawn position to permit the insertion and removal of the skein and into an extended position for the retention of the skein.

25. In a machine of the character described, a skein carrying section comprising a pair of pins one of which is bodily adjustable toward and away from the other for holding skeins of different lengths and the other pin having an eccentric portion arranged to be swung into a withdrawn position for the insertion and removal of the skein and into an extended position for the retention of the skein.

26. In a machine of the character described, a skein carrying section comprising a plurality of pairs of pins one pin of each pair being bodily adjustable toward and away from the other pin for holding skeins of different lengths and the other pin of each pair having an eccentric portion arranged to be swung into a withdrawn position to permit the insertion and removal of the skein and into an extended position for the retention of the skein.

27. In a machine of the character described, a skein carrying section comprising a plurality of pairs of pins projecting from opposite sides of the section, one pin of each pair being bodily adjustable toward and away from the other pin for holding skeins of different lengths and the other pin of each pair having an eccentric portion arranged to be swung into a withdrawn position to permit the insertion and removal of the skein and into an extended position for the retention of the skein.

28. In a machine of the character described, a yarn frame, a hook depending therefrom and a vertically movable skein carrying section arranged to be held in its raised position by said hook.

29. In a machine of the character described, a yarn frame having a plurality of hooks and a plurality of vertically movable skein carrying sections arranged to be held in their raised position by said hooks.

30. In a machine of the character described, a skein carrying section comprising a pair of pins one of which has an eccentric portion arranged to be swung into a withdrawn position and an extended position and means for locking and releasing the said pin.

31. In a machine of the character described, a skein carrying section comprising a plurality of pairs of pins one pin of each pair having an eccentric portion arranged to be swung into a withdrawn position and an extended position and means for locking and releasing the said rocking pin of each pair.

32. In a machine of the character described, a yarn frame, a hook depending therefrom, a vertically movable skein carrying section arranged to be held in its raised position by said hook, a pair of pins on said section one of which has an eccentric portion arranged to be swung into a withdrawn position and into an extended position and a locking and releasing device for said pin arranged to be released when the section is in its raised position and locked when the section is in its lowered position.

33. In a machine of the character described, a yarn frame having a hook depending therefrom, a vertically movable skein carrying section arranged to be held in its raised position by said hook, a plurality of pairs of pins carried by the section one pin of each pair having an eccentric portion arranged to be swung into a withdrawn position and an extended position and a locking and releasing device for said pins arranged to be released when the section is in its raised position and locked when the section is in its lowered position.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this eighth day of August 1907.

HENRY HENNIG.

Witnesses:
F. GEORGE BARRY,
HENRY THIEME.