

No. 652,797.

Patented July 3, 1900.

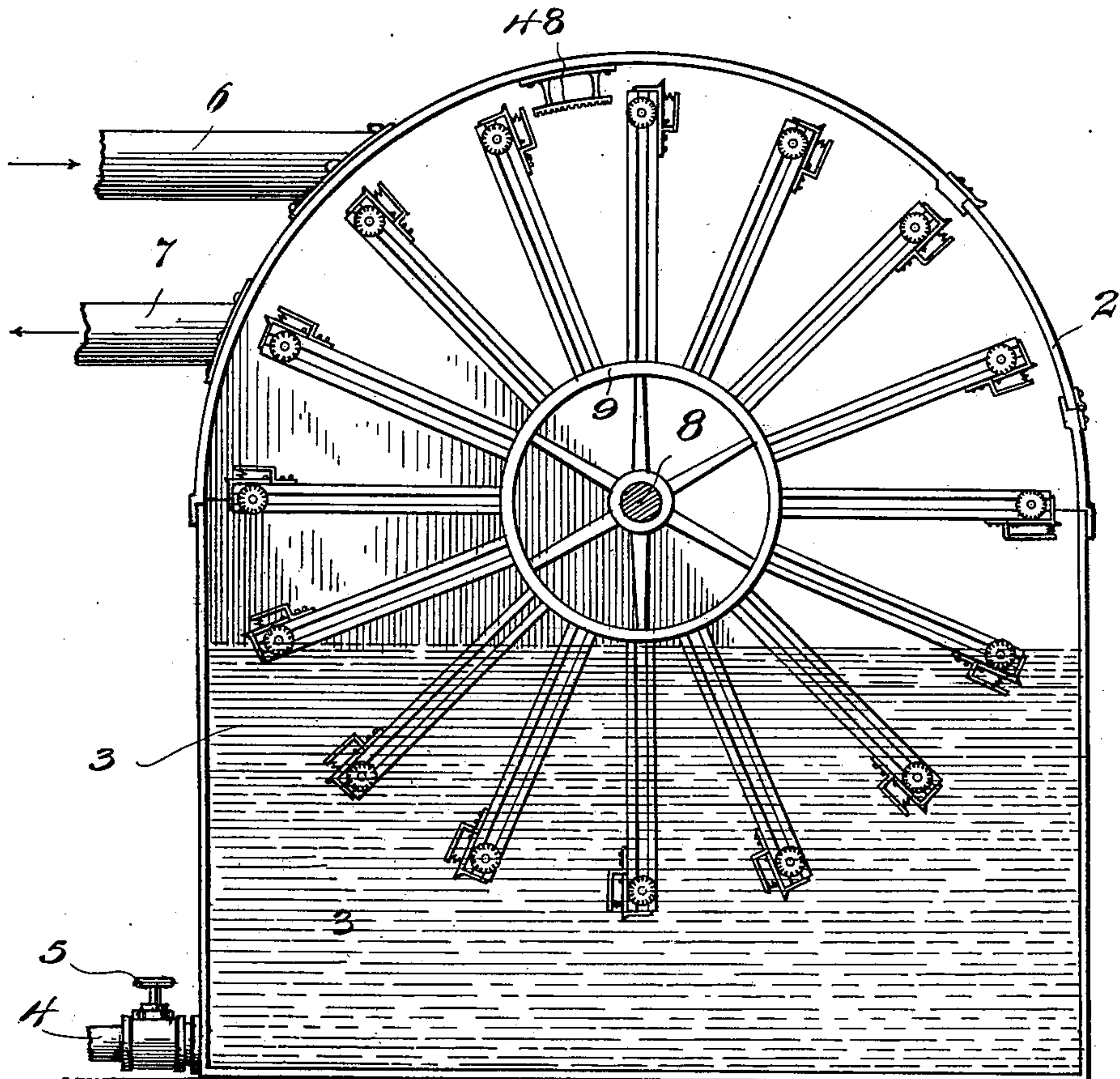
G. MALLINSON.  
APPARATUS FOR DYEING, &c.

(Application filed Apr. 16, 1900.)

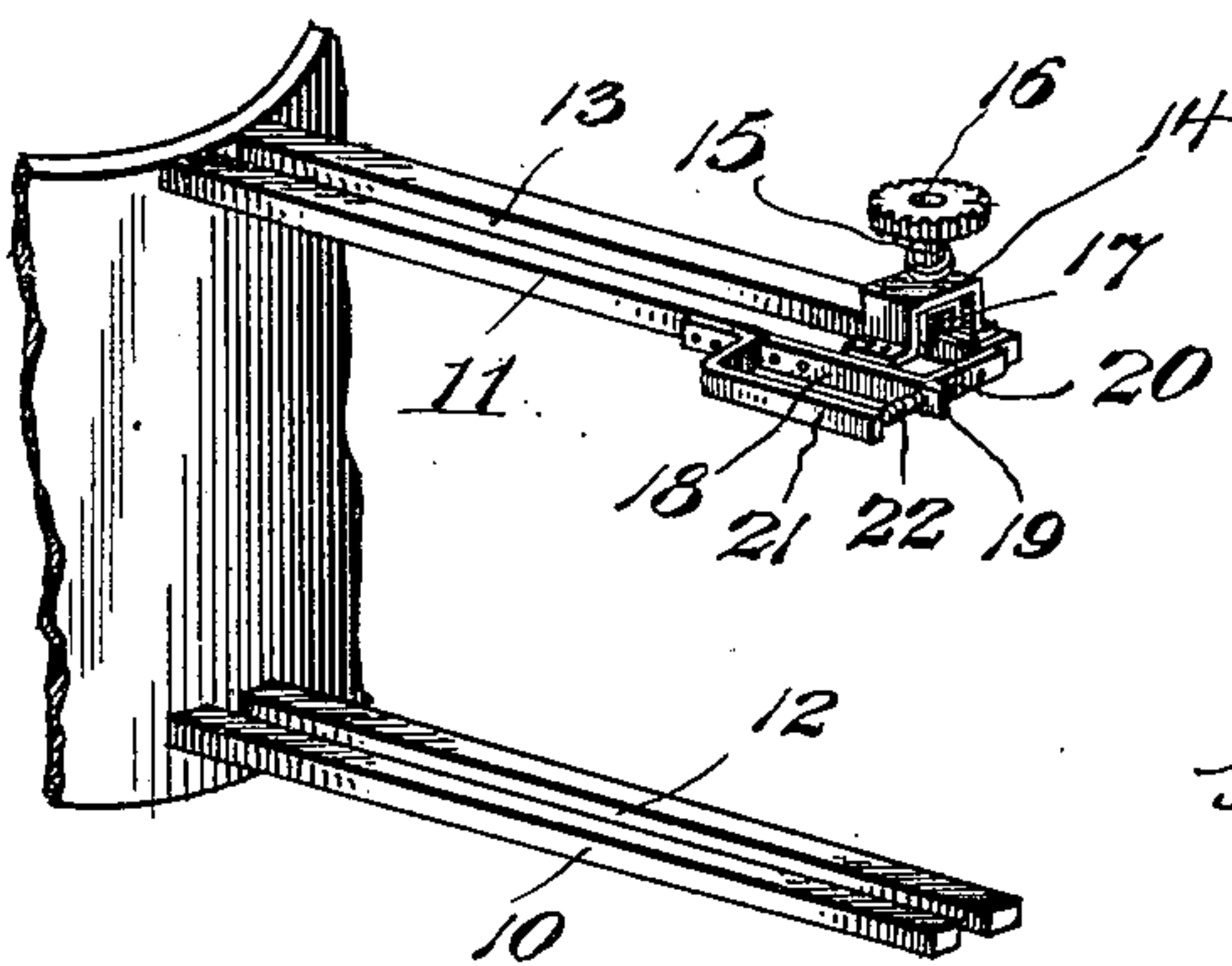
(No Model.)

2 Sheets—Sheet 1.

*Fig. 1.*



*Fig. 2.*



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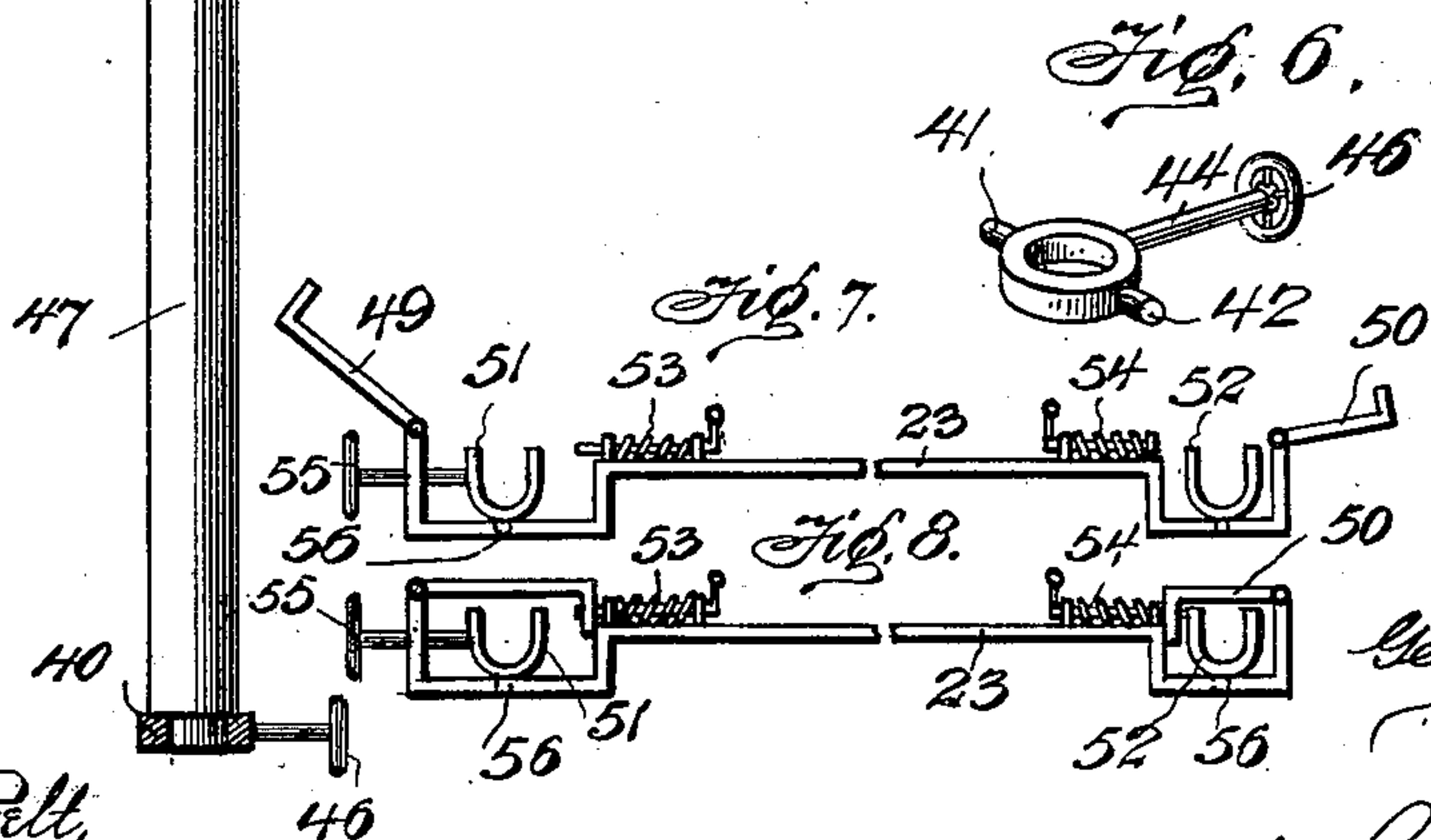
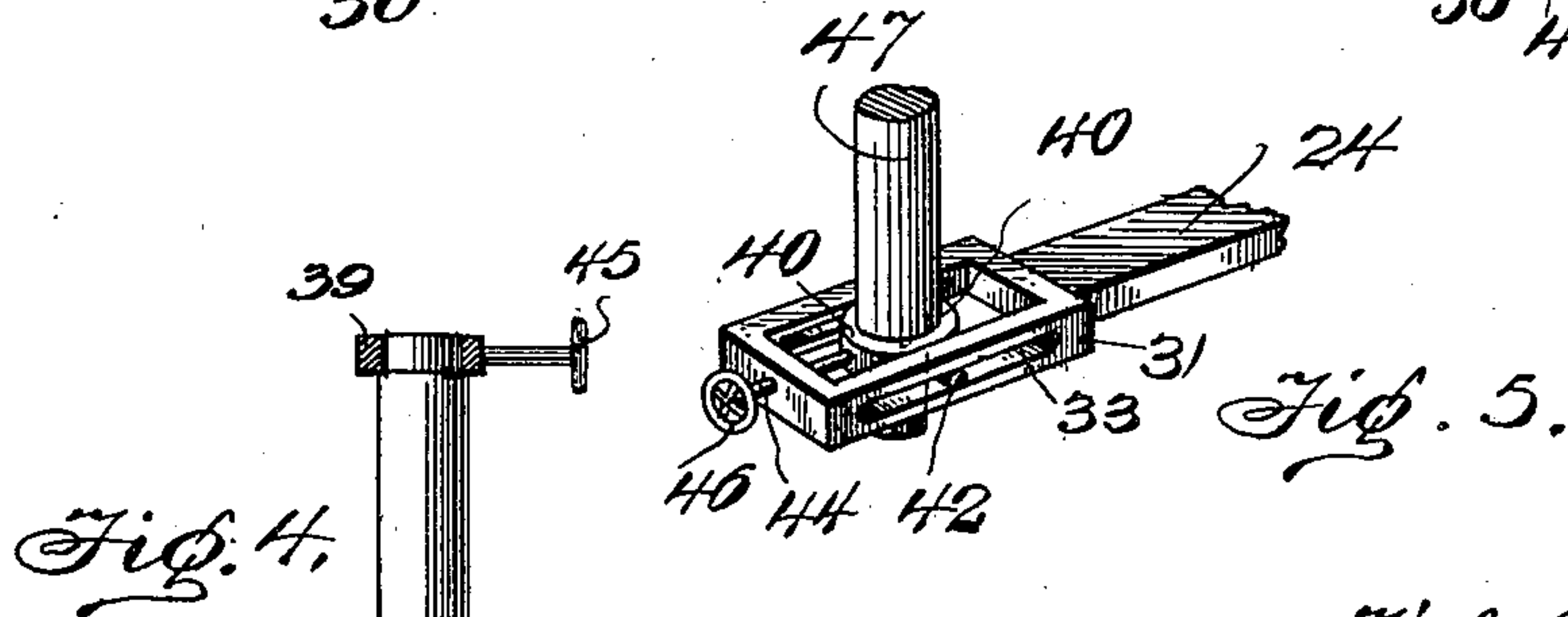
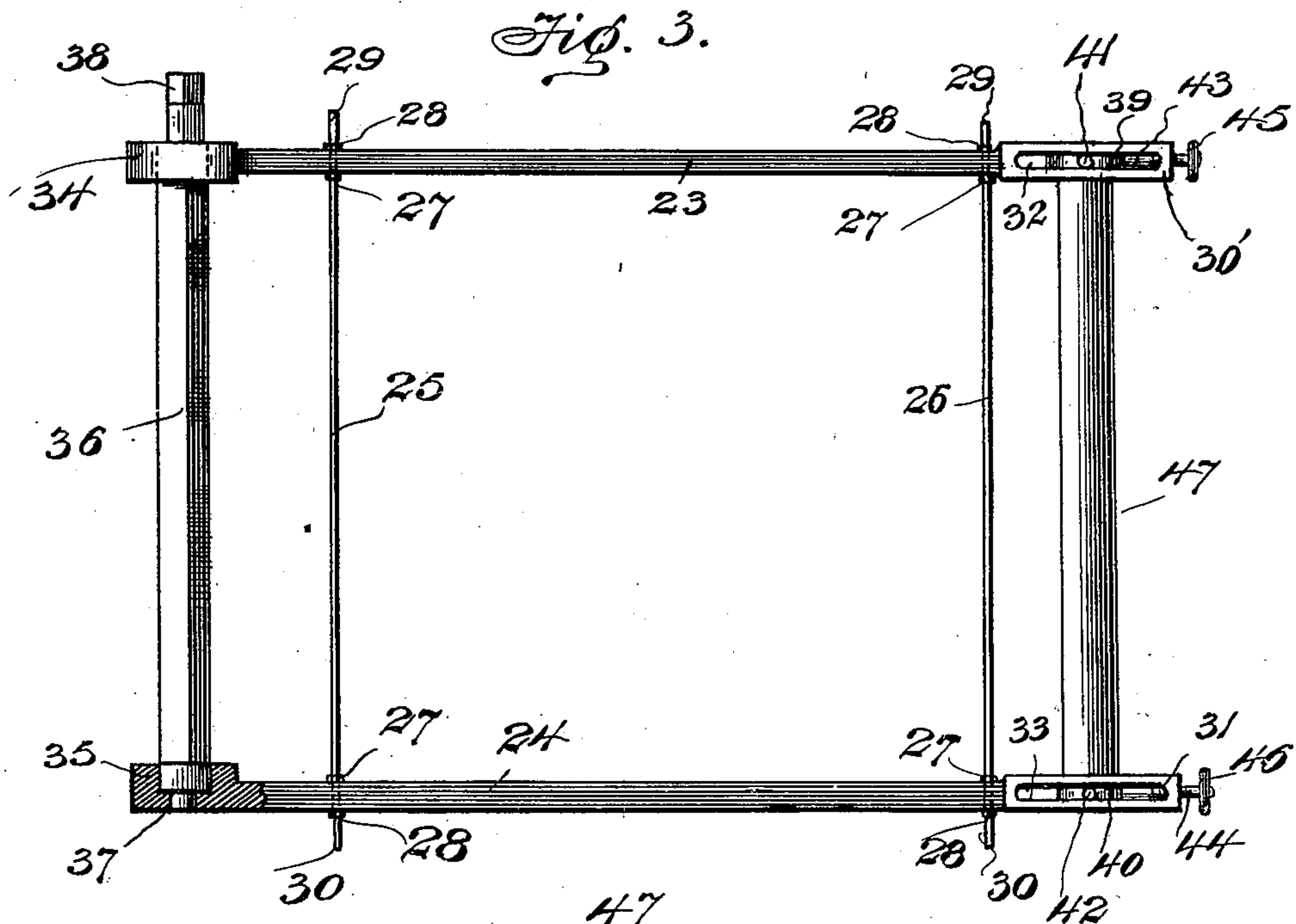
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2 Sheets—Sheet 2.



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# UNITED STATES PATENT OFFICE.

GEORGE MALLINSON, OF CAROLINE, RHODE ISLAND.

## APPARATUS FOR DYEING, &c.

SPECIFICATION forming part of Letters Patent No. 652,797, dated July 3, 1900.

Application filed April 16, 1900. Serial No. 13,100. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE MALLINSON, a citizen of the United States, residing at Caroline, in the county of Washington and State of Rhode Island, (whose post-office address is Box 21, Caroline, Rhode Island,) have invented certain new and useful Improvements in Yarn Dyeing or Drying Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to machines for dyeing or drying yarn in the skein, and has for its object the production of certain improved devices whereby machines for dyeing loose stock—such, for instance, as that described in my Patent No. 620,470, dated February 28, 1899—may be adapted to the double purpose of dyeing loose stock and dyeing yarn in the skein.

With this object in view my invention consists in the improved construction, arrangement, and combination of parts hereinafter fully described and afterward specifically claimed.

In the accompanying drawings, Figure 1 is a view, partly in section and partly in elevation, illustrating the apparatus, the side of the vat being removed. Fig. 2 is a fragmentary perspective view of a portion of the hub and a pair of frame-supporting slides detached from the machine. Fig. 3 is a view in side elevation of one of the yarn stretching and supporting frames detached. Fig. 4 is a view, partly in section and partly in elevation, illustrating the adjustable rod for stretching the skein. Fig. 5 is a detail perspective view of one end of one member of the yarn-frame, illustrating the stretching means. Fig. 6 is a detail perspective view of one of the adjustable bearings for the skein-rods detached from the machine. Fig. 7 is a top plan view of one of the members of the yarn-stretching frame of a modified construction, the latches being shown open; and Fig. 8 is a similar view of the same parts with the latches closed.

Referring to the drawings by numerals, 1 indicates the yarn tank or vat, which is preferably rectangular, with a semicylindrical top, a door 2 being provided in the top to permit

of access to the interior. The tank is intended to contain a suitable quantity of dyeing mixture, as at 3, and will be preferably provided with a suitable discharge-pipe 4, provided with a valve 5, and in some instances pipes 6 and 7 for the admission and discharge of hot air for drying purposes can also be provided.

8 indicates a horizontal shaft journaled in suitable bearings in the sides of the tank or vat, upon which is mounted a hub 9 of any suitable form—in this instance being composed of a cylinder or ring concentric with the shaft and supported thereon by suitable spokes. Radiating from the hub and secured thereto in any preferable manner are slides arranged in pairs, one above the other, the lower slide being marked 10 and the upper slide 11. Each slide is provided with a longitudinal slot or space extending from the hub through the outer end of the slide and marked, respectively, 12 and 13. On the top of the upper slide 11 is secured a bearing 14, in which is journaled a short shaft 15, provided on its upper end with a pinion 16 above the bearing and a squared socket 17 below the bearing, said socket having its bottom and outer face open. To one side of each slide 11 is secured a spring-strip 18, which projects slightly beyond the end of the slide, as at 19, and is provided with a laterally bent or latching projection 20, normally held by the elasticity of the spring across the outer end of the slide 11, closing the slot 13 at that point. A rigid bar 21 is also secured to one side of the slide 11, extending outside of and parallel with the spring-strip 18. A coil-spring 22 is mounted between the outer end of the bar 21 and spring 18, whereby its elastic power is added to the elasticity of the spring to maintain the spring in its normal position, as aforesaid.

23 and 24, Fig. 3, indicate the upper and lower bars of the yarn-frame, said bars being rigidly connected together by rods 25 and 26, secured by nuts 27 and 28, bearing upon the inner and outer faces of the bars 23 and 24. These rods 25 and 26 are extended beyond the bars 23 and 24, as indicated at 29 and 30, for a purpose to be hereinafter specified. At the inner ends of the bars 23 and 24 are rectangular frames 30' and 31, provided with



longitudinal slots 32 and 33 in their sides. At their inner ends these bars are provided with heads or frames 34 and 35, each of which is formed with a rounded socket, as shown.

36 indicates the outer skein-supporting rod, which is square, except at its lower end 37, where it is rounded to fit in the rounded socket in the head or frame 35. The upper square end of the rod 36 projects above the yarn-frame, as at 38. In each of the frames 30' and 31 is located a bearing-ring, as at 39 and 40, over the sides of which rings project trunnions 41 and 42 into the slots 32 and 33. A screw, as at 43 and 44, projects from each of said bearing-rings through the ends of the frames 30' and 31, said screws being provided outside of the frames with adjusting-nuts 45 and 46.

47 indicates a round rod adapted to be slipped into the bearing-rings 39 and 40, forming the second skein-supporting rod.

On the inner face of the circular top of the vat or tank is secured a rack 48, facing toward the shaft 8 and curved on an arc having the shaft for its center.

In the operation of this invention the skein-supporting rods 36 and 47 are removed from the yarn-frame, the skein of yarn slipped over the frame, the rods 36 and 47 slipped endwise into their bearings, and the screws 45 and 46 manipulated to stretch the skein of yarn on said rods 36 and 47. The door 2 being open, the yarn-frame will be slipped into the vat or tank, the projecting ends 29 and 30 of the rods 25 and 26 sliding into the slots or spaces 12 and 13, the spring 18 having been drawn back, so as to remove the latch projection 20 from the end of the slot 13. The yarn-frame, with the skein of yarn thereon, is introduced with the rod 47 toward the center or in advance of the rod 36, and when the rod 36 reaches the outer end of the slide 11 the square upper end 38 of said rod seats itself in the open socket 17. The spring 18 is now released and resumes its normal position, with its latch projection 20 across the outer end of the slot 13, thereby preventing the accidental sliding of the yarn-frame. This operation is repeated until as many of the yarn-frames are introduced as desired within the limit of the capacity of the machine. By the means described the square-rod 36 is coupled to the shaft 15 and pinion 16, and when in the rotation of the main frame with the shaft 8 the pinions 16 engage the racks 48 the pinions, the shafts 15, sockets 17, and square rods 36 are rotated, causing the position of the skein on the yarn-frame to be changed. Thus during each revolution of the main frame the skein on each yarn-frame is changed in position, thereby presenting all parts of the skein in different positions to the dyeing mixture and insuring uniform coloring of all its parts.

In Figs. 7 and 8 I have illustrated one of the members of the yarn-frame, as 23, modified somewhat in construction to permit the insertion of one end of the rods 36 and 47 lat-

erally instead of longitudinally into their bearings. In this construction the rectangular frames at the ends of the bar 23 are provided with a hinged side, as at 49 and 50, and the bearing-rings are omitted, U-shaped bearings 51 and 52 being substituted therefor. After one end of each of the rods 36 and 47 have been inserted longitudinally in the bearings of the arm 24 their free ends may be passed laterally into the U-shaped bearings 51 and 52, when the hinged sides 49 and 50 will be folded into position, as shown in Fig. 8, and secured therein by spring-bolts 53 and 54. The open U-shaped bearing 51 is adjusted by means of a screw 55, the same as in the construction formerly described, said bearing being provided with but a single trunnion 56, movable in a slot in the stationary side of the rectangular frame.

By means of this invention machines for dyeing stock such as described in my before-mentioned patent may be readily adapted to dye yarn in the skein, thus extending the usefulness of the machine and economizing by rendering a single machine useful for the purposes for which two or more machines have been heretofore required.

It will be readily understood by those skilled in the art that the apparatus herein described will be equally applicable for the purpose of dyeing the dry skein of yarn or for performing any other operation thereon which requires the immersion in liquids or their rotation in air or other fluids.

While I have specifically described the constructions of the various parts pertaining to my invention, it will be obvious that many slight changes and variations might be made therein without departing from the spirit or scope of the invention.

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

1. In a machine for dyeing or drying yarn, the combination with a suitable tank or vat, and a shaft journaled therein, of a frame comprising a hub mounted on said shaft, slotted slides radiating therefrom and open at the ends, and yarn-stretching frames adapted to be inserted radially and secured in said slides, substantially as described.

2. In a machine for dyeing or drying yarn, the combination with a suitable tank or vat, and a shaft journaled therein, of a frame comprising a hub mounted on said shaft, slotted slides radiating therefrom and open at their ends, yarn-stretching frames adapted to be inserted radially in said slides, means for securing said frames in the slides, and means for changing the position of the skeins on the frames, substantially as described.

3. In a machine for dyeing or drying yarn, the combination with a rotatable main frame provided with radiating slides, of yarn-frames provided with rotatable yarn-supporting rods and adapted to be removably mounted in said slides, a pinion journaled in bearings at the



outer end of each slide, a coupling for connecting said pinion and one of the rotatable rods of the yarn-frame, and a rack mounted on the inside of the tank in the path of rotation of the main frame for engaging said pinions, substantially as described.

4. In a machine for dyeing or drying yarn, a yarn-stretching frame comprising two parallel bars, rods for rigidly securing said bars together, bearings in one end of said bars, a square rod journaled in said bearings and provided with a projecting square end, adjustable bearings in the opposite end of said bars, and a rod mounted to rotate in said adjustable bearings, substantially as described.

5. In a machine for dyeing or drying yarns in skeins, a stretching-frame comprising parallel bars, rods for securing them rigidly together, a square rod mounted at one end of the frame, rectangular frames at the opposite ends of the bars provided with longitudinal slots in their sides, bearing-rings in said rectangular frames having trunnions projecting into said slots, a rod rotatable in said bearing-rings, and screws for moving said bearing-rings longitudinally of said frames, substantially as described.

6. In a machine for dyeing or drying yarn,

a yarn-stretching frame comprising parallel bars, rods for securing them rigidly together, closed bearings at opposite ends of one of the bars, open bearings at opposite ends of the other bar, means for closing the open side of said bearings, spring-bolts for securing them in their closed positions, and rods upon which to stretch the skein adapted to be inserted longitudinally in the closed bearings and laterally in the open bearings, substantially as described.

7. In a machine for dyeing or drying skein-yarn, a rotatable main frame comprising a hub, and radiating slides provided with longitudinal slots open at their ends, spring-latches for closing the slots at their outer ends, a bearing mounted upon the outer end of each slide over its slot, a shaft journaled in said bearing, a pinion on the upper end of said shaft, and a coupling-socket on the lower end of said shaft, substantially as described.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

GEORGE MALLINSON.

Witnesses:

WALTER H. HAMILTON,  
JOSEPH E. MALLINSON.