No. 680,553. Patented Aug. 13, 1901.

J. T. TRAVIS.

REVERSING APPARATUS FOR DYE VATS, &c.

(Application filed May 15, 1901.)

(No Model.) 3 Sheets—Sheet 1.

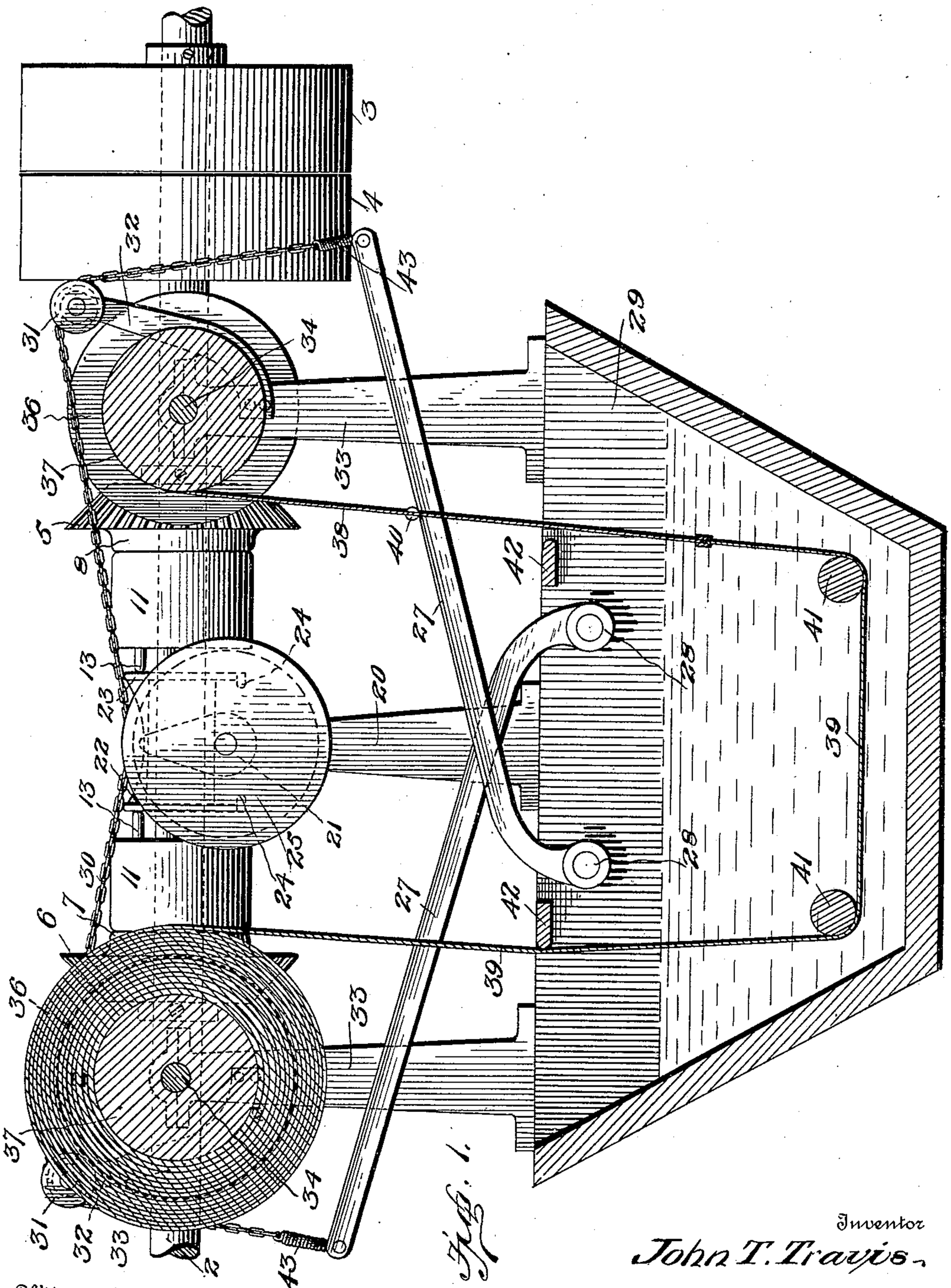

Fig. 1.

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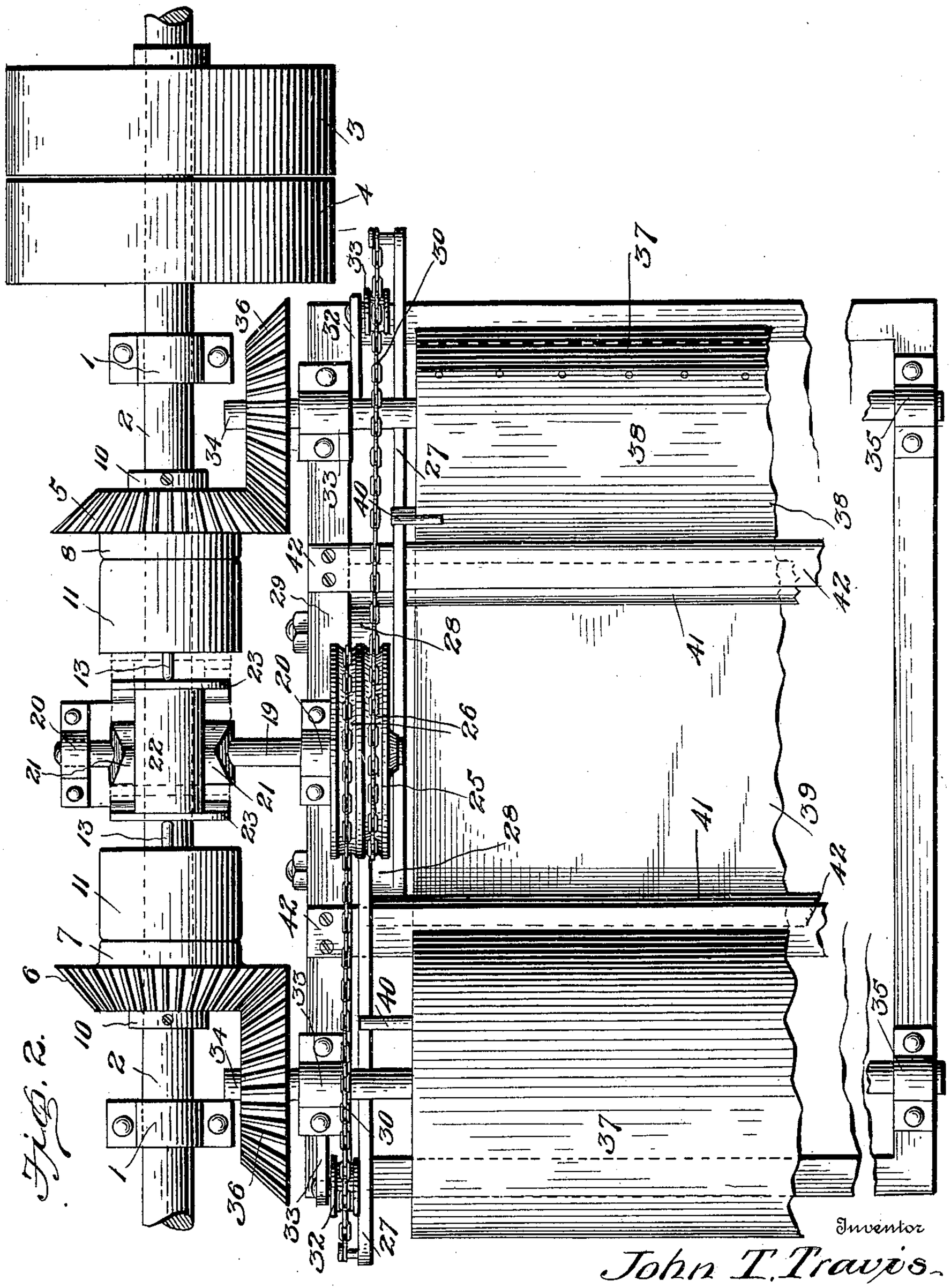

Fig. 2.

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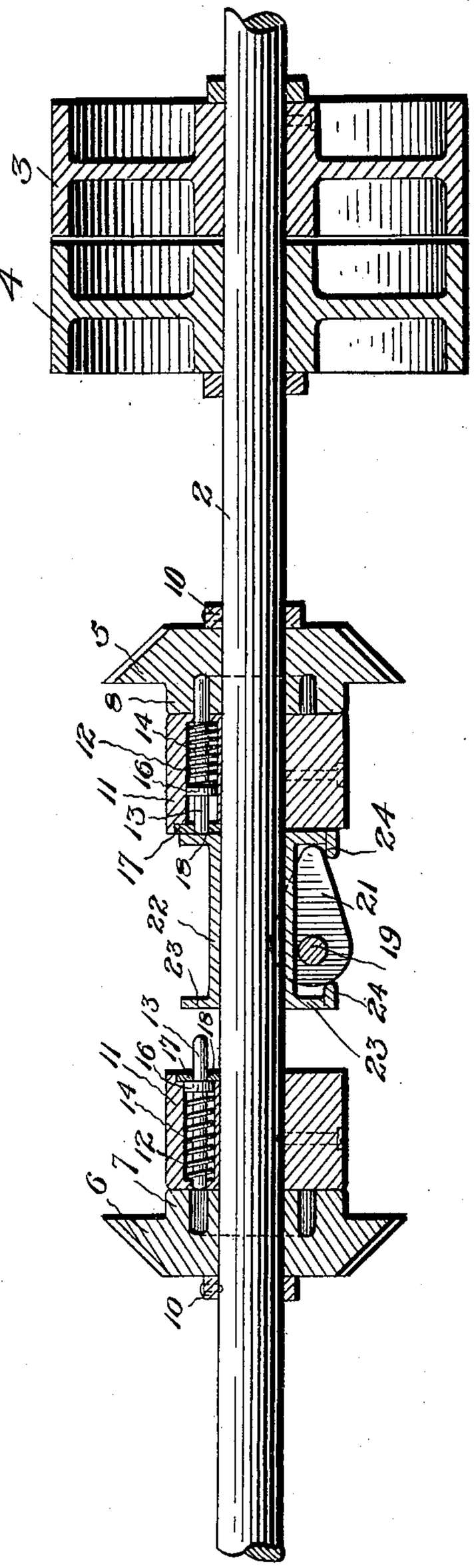

Fig. 3.

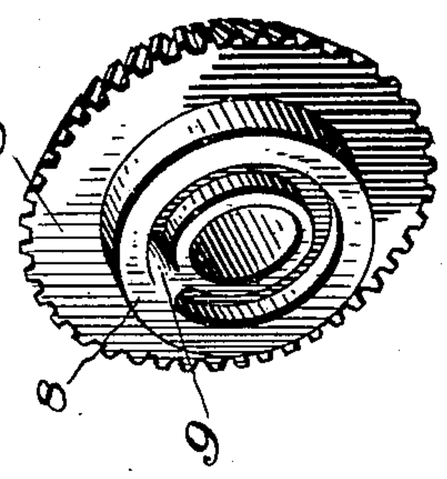

Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN T. TRAVIS, OF PATERSON, NEW JERSEY, ASSIGNOR OF ONE-HALF TO NORVAL BRADLEY, OF SAME PLACE.

REVERSING APPARATUS FOR DYE-VATS, &c.

SPECIFICATION forming part of Letters Patent No. 680,553, dated August 13, 1901.

Application filed May 15, 1901. Serial No. 60,339. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. TRAVIS, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Reversing Apparatus for Dye-Vats and other Machines; and I do 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.

The invention relates to reversing apparatus for dye-vats and other machines.

The object of the invention is to provide apparatus of this character which shall be simple of construction, durable in use, comparatively inexpensive of production, and by means of which the fabric under treatment will be automatically passed back and forth through the dye liquor from a drum mounted at one end of the vat to a drum mounted at the opposite end, thus dispensing with the employment of an operator for each machine to reverse the direction of movement of the cloth and making it possible for one operator to attend to a large number of machines at the same time, as his attention is only required in stopping and starting the machine.

With this and other objects in view the invention consists of certain novel features of construction, combination, and arrangement of parts, which will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a longitudinal vertical section through a dye-vat, taken through the cloth-drums and cloth and showing in side elevation my improved reversing mechanism for changing the direction of movement of the cloth within said vat. Fig. 2 is a top plan view of my reversing mechanism, a portion of a fragment of the web of cloth being shown and of the cloth-attaching strip and the trip for operating the reversing-levers. Fig. 3 is a longitudinal sectional view through the drive-shaft and parts thereon mounted, and Fig. 4 is a detail perspective view of one of the loosely-mounted clutch members and its drive-gear.

Referring to the drawings, 1 denotes bearings, 2 the drive-shaft, having its ends mounted in said bearings and provided near one end with a fixed pulley 4 and an idle pulley 3, the former of which is adapted to be driven by a belt from any suitable source of power-supply and the latter of which is adapted to receive the belt when it is desired to stop the machine. 5 and 6 denote two bevel gear-wheels loosely mounted upon said shaft, and 7 and 8 denote two clutch members fixed to turn in unison with the gear-wheels 6 and 5, respectively, and are preferably cast integral with said gear-wheels, and each is provided on its inner face with an annular groove having a cross-stop 9. Each gear-wheel, with its clutch member, is confined on said shaft against longitudinal movement thereon by a fixed collar 10 and a clutch member 11, each of which is fixed to said shaft. The clutch member 11 is preferably in the form of a hub and is provided with a longitudinal opening or chamber 12, within which is located a rod 13, upon which is placed a coil-spring 14, which is confined between the forward wall of the chamber and an annular shoulder 16, secured to said rod. A cap-plate 17 is secured to the hub to limit the forward throw or movement of the rod, the inner end of which is held normally projected through an aperture 18 in the cap-plate by the action of the spring.

19 denotes a rock-shaft journaled in suitable bearings 20 and provided with fixed shipper-lugs 21.

22 denotes a shipper-head mounted loosely upon the drive-shaft between said shipper-lugs and provided at its ends with laterally-projecting flanges 23, which are arranged within the path of movement of the shipper-lugs and are adapted to be engaged thereby in the rocking of the shaft 19 to move the shipper-head longitudinally upon the drive-shaft to move the spring-actuated rods.

When the shipper-lug is in the position shown in dotted lines in Fig. 2 and full lines in Fig. 3, the spring-actuated lug carried by the clutch member 11 has its outer end projecting into the groove of the clutch member 8, and when it comes in contact with the stop

in said groove the clutch member 8 and gear-wheel 5 are caused to turn in unison with the clutch member 11 and drive-shaft. When in this position, the point or projecting end of the shipper-lug is in engagement with the stop 24, which prevents the shipper-lug from being moved too far downwardly and out of engagement with the flange.

25 denotes a rock-drum fixed to the shaft 19 and provided with two grooves 26.

27 denotes crossed reversing-levers, each having its lower end pivoted to lugs 28, projecting inwardly from the sides of the dye-vat 29, and their upper ends connected to the lower ends of chains 30, the upper ends of which are wound around the rock-drum in opposite directions and are fixed thereto, said chains being supported or guided intermediate their ends by pulleys 31, mounted in brackets 32.

33 denotes posts or standards secured to the ends of the dye-vat. 34 denotes shafts journaled in the upper ends of said standards 33 and in the upper ends of standards 35. Fixed to said shafts 34 are bevel gear-wheels 36, which are in mesh with the bevel gear-wheels 5 and 6 and receive motion therefrom.

37 denotes cloth-drums fixed to the shafts 34, and 38 denotes cloth-attaching strips fixed to said drums and of suitable length to reach to the dye liquor in said vat.

39 denotes a strip of cloth connected at each end to the attaching-strips, and 40 denotes trips carried by the attaching-strips for actuating the reversing-levers.

41 denotes a roller journaled in the lower end of the tank, about which the cloth strip rolls, and 42 denotes slats arranged across the tank for preventing the cloth from creasing as it is wound on the cloth-drums.

In operation as the cloth is drawn through the dye liquor in the vat from one drum to the other a trip will engage one of the reversing-levers and depress the same, thus rocking the shaft 19, which movement shifts the shipper-head 22 and allows the spring-actuated rod with which it has been in engagement to free itself from one of the loose clutch members and at the same time throw said shipper-head toward the other end of the shaft and force the opposite spring-actuated pin outwardly into engagement with the other loose clutch member and cause said clutch member to rotate with the main shaft, and as this latter clutch member rotates with the gear-wheel which is beveled in a direction the reverse of that of the gear-wheel just freed from locked engagement with the shaft the movement of the cloth-drums will be reversed and the cloth caused to travel in a reverse direction to that just described. This movement is repeated as many times as is desired, and after the cloth has been thoroughly treated the drive-belt is slipped from the pulley 4 onto the pulley 3 and the machine comes to a stop. To prevent breakage of the chains 30, caused by sudden jerks due to the trips suddenly striking the reversing-levers, I incorporate within the length of each chain a coil-spring 43, which is of sufficient strength and tension to cause the rocking of the shaft 9 when the levers are depressed, but which will give sufficiently when the levers are struck by the trips to prevent damage to the chains.

From the foregoing description, taken in connection with the accompanying drawings, the construction, operation, and advantages of my invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion, and details of construction may be made within the scope of the invention without departing from the spirit or sacrificing any of the advantages thereof.

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

1. In combination with the cloth-drums and their gears, of a drive-shaft provided with gears meshing with those aforesaid and adapted to alternately rotate them in opposite directions, clutch mechanism actuated by the drive-shaft, a shipper-head for actuating the clutch mechanism, a rock-shaft, a shipper-lug fixed to said shaft to reciprocate the shipper-head alternately in opposite directions, clutch mechanism actuated by the shipper-head for locking the second-named gear-wheels alternately to the drive-shaft, reversing-levers connected to the rock-shaft, and trips for alternately engaging said reversing-levers to actuate the same, substantially as set forth.

2. In combination with the cloth-drums and their gears, of a drive-shaft provided with gears meshing with those aforesaid and adapted to alternately rotate them in opposite directions, clutch mechanism actuated by the drive-shaft, a shipper-head for actuating the clutch mechanism, a rock-shaft, a shipper-lug fixed to said shaft to reciprocate the shipper-head alternately in opposite directions, clutch mechanism actuated by the shipper-head for locking the second-named gear-wheels alternately to the drive-shaft, reversing-levers flexibly and yieldingly connected to the said rock-shaft, and trips for alternately engaging said reversing-levers to actuate the same, substantially as set forth.

3. In combination with the cloth-drums and their gears, of a drive-shaft provided with gears meshing with those aforesaid and adapted to alternately rotate them in opposite directions, clutch mechanism actuated by the drive-shaft, a shipper-head for actuating the clutch mechanism, said shipper-head provided at its ends with side flanges having stops at their lower ends, a rock-shaft, a shipper-lug fixed to said shaft to reciprocate the shipper-head alternately in opposite di-

rections, clutch mechanism actuated by the shipper-head for locking the second-named gear-wheels alternately to the drive-shaft, reversing-levers connected to the rock-shaft, and trips for alternately engaging said reversing-levers to actuate the same, substantially as set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN T. TRAVIS.

Witnesses:
THOMAS F. MCORAN,
ABRAM KLENERT.