

No. 654,824.

Patented July 31, 1900.

J. M. D. BLAND.
SPEED REGULATOR FOR PUMPS.

(No Model.)

(Application filed Sept. 28, 1899.)

2 Sheets—Sheet 1.

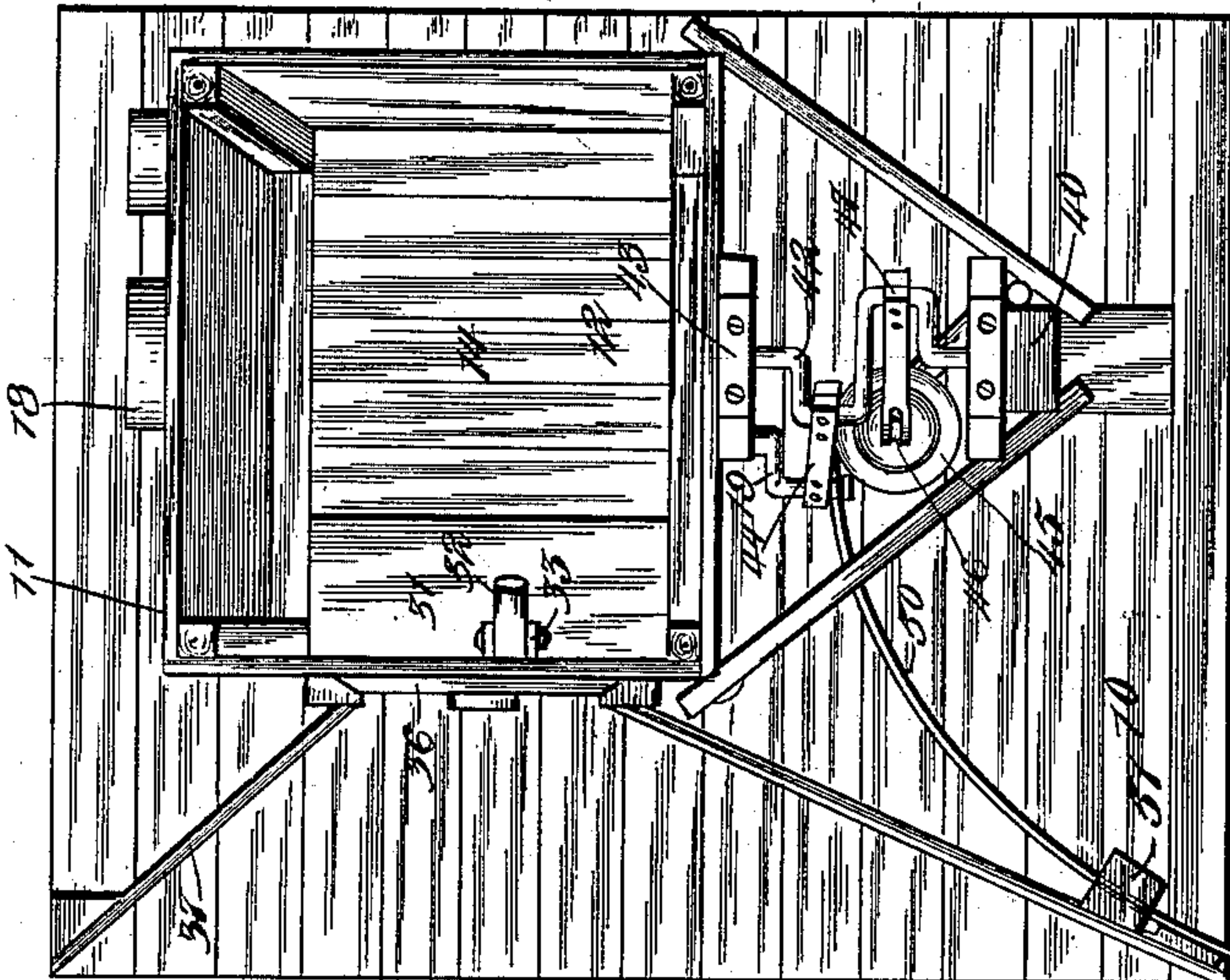


Fig. 2.

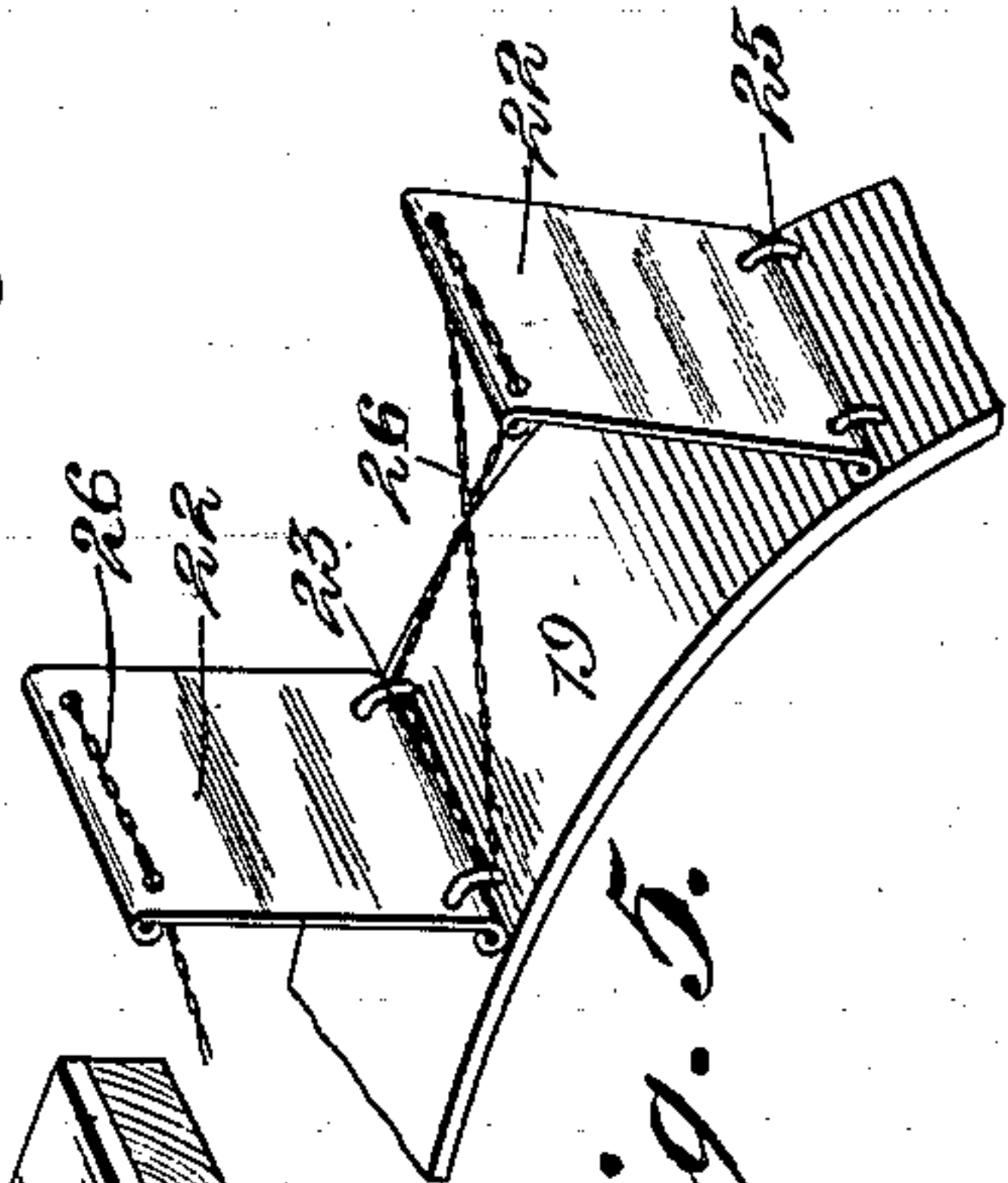


Fig. 5.

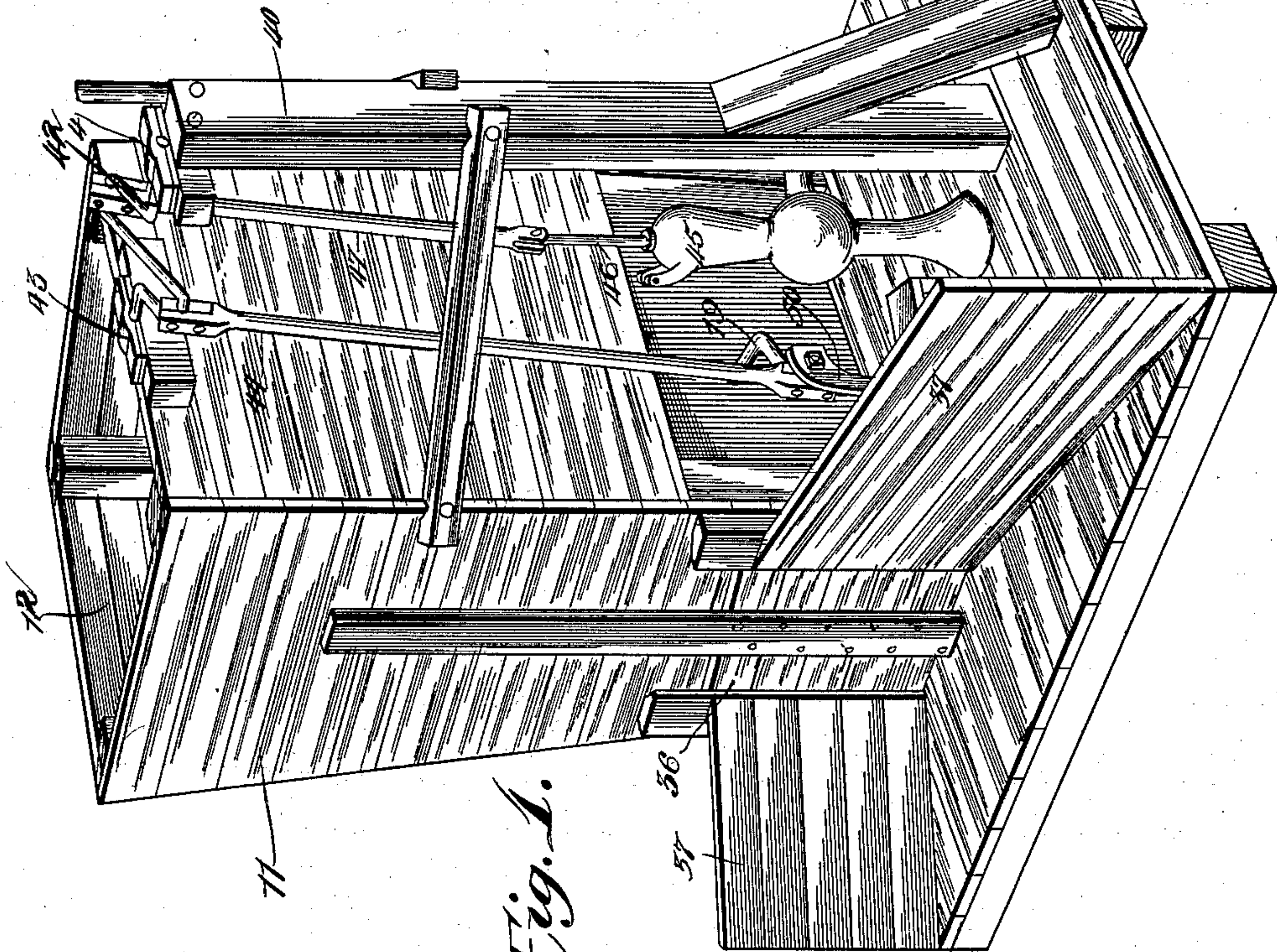


Fig. 1.

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Fig. 4.

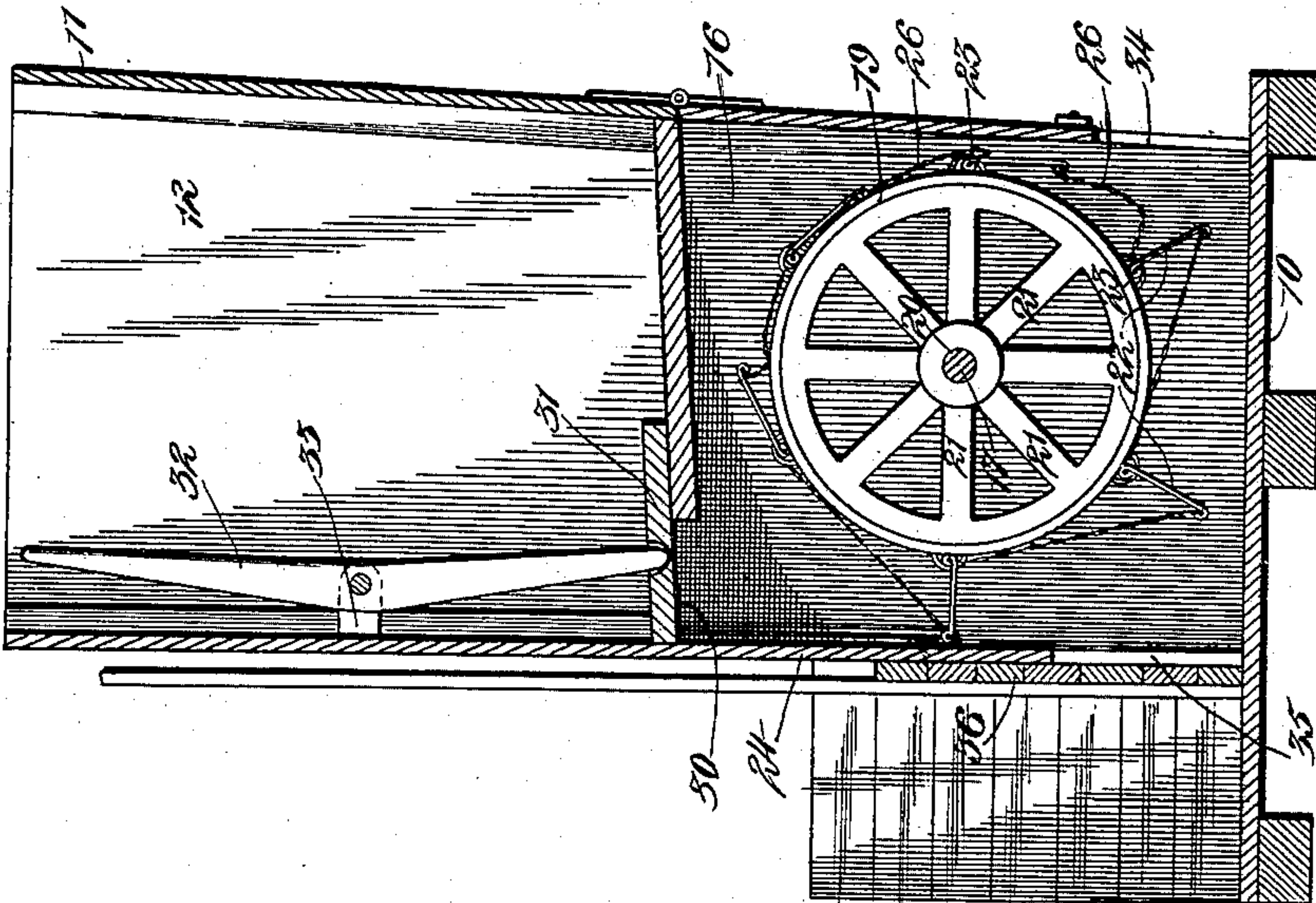
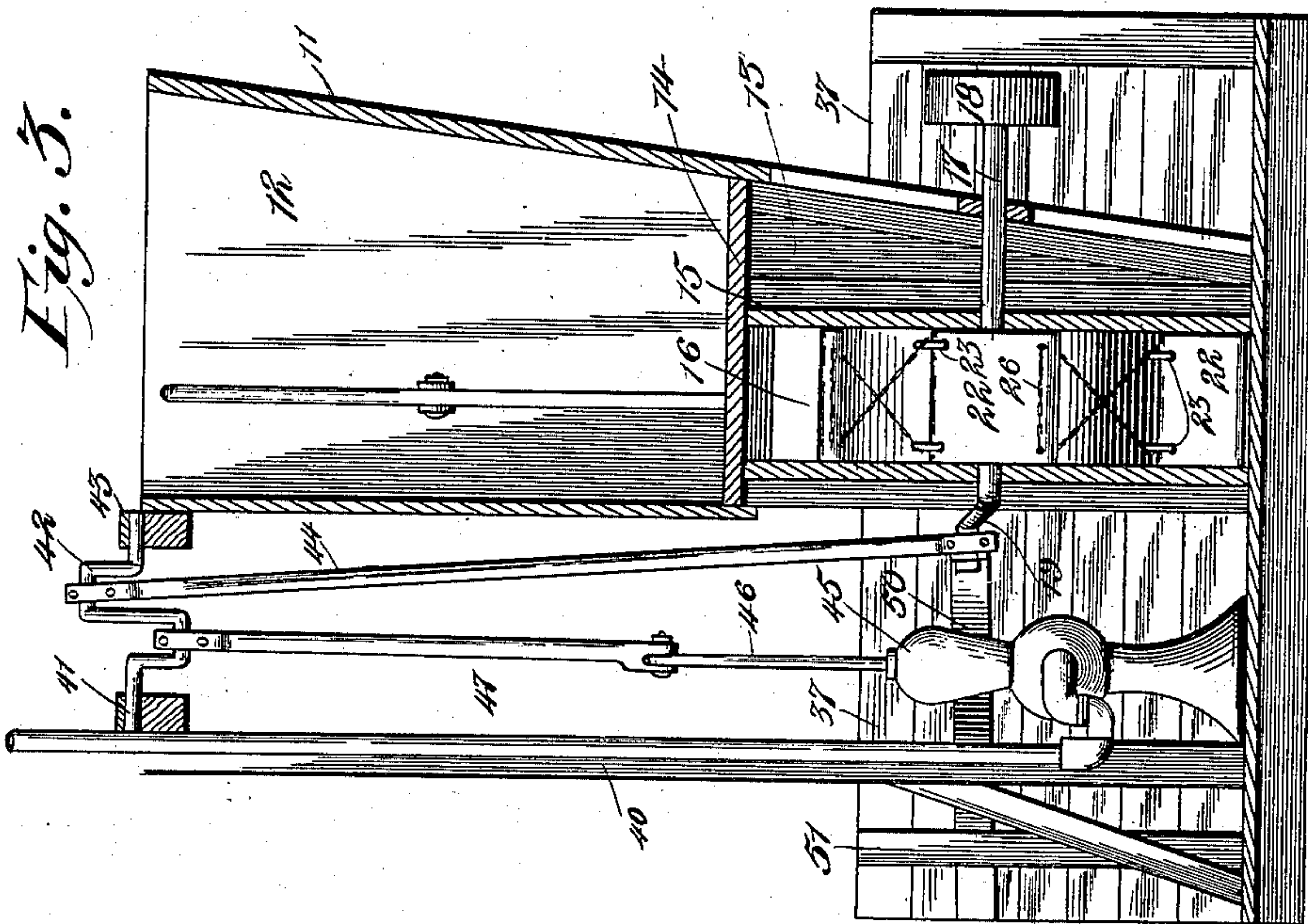


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN MILES DUVAL BLAND, OF BAKER CITY, OREGON.

SPEED-REGULATOR FOR PUMPS.

SPECIFICATION forming part of Letters Patent No. 654,824, dated July 31, 1900.

Application filed September 28, 1899. Serial No. 731,929. (No model.)

To all whom it may concern:

Be it known that I, JOHN MILES DUVAL BLAND, a citizen of the United States, residing at Baker City, in the county of Baker and State of Oregon, have invented a new and useful Speed-Regulator for Pumps, of which the following is a specification.

This invention relates to water-wheels in general, and more particularly to that class known as "bucket-wheels;" and it has for its object to provide such a construction and arrangement that the parts will have a smooth and steady working and will be well adapted for the operation of a force-pump.

In the drawings forming a portion of this specification, and in which similar numerals of reference designate corresponding parts in the several views, Figure 1 is a perspective view of the complete structure. Fig. 2 is a plan view of Fig. 1, showing the inside of a hopper. Fig. 3 is a transverse vertical section in the line of the axis of the water-wheel, said wheel and connected parts being shown in elevation. Fig. 4 is a vertical section taken centrally of the hopper shown in Fig. 3 and looking to the left. Fig. 5 is a detail perspective showing the connection of the hinged buckets with the drum of the water-wheel.

Referring now to the drawings, 10 represents a base or platform upon which is built a casing 11, which is rectangular in cross-section and converges downwardly at one side. This casing is divided into an upper compartment or hopper 12 and a lower compartment 13 by means of a horizontal partition 14, the compartment 13 being again divided by a vertical partition 15 to form a wheel-pit 16. Passed transversely through the sides of the pit 16 and the opposite side of the casing and journaled therein is a wheel-shaft 17, having a belt-pulley 18 upon one end and a crank 19 upon the other end. Upon this shaft and within the pit 16 is a water-wheel comprising a drum 19 and a hub 20, having connecting-spokes 21, and upon which drum is hinged a series of buckets, each consisting of a plate 22, having a hinge connection 23 at its inner edge to the outer surface of the drum and which plate is of the same width as the drum and of a sufficient length to move close to the front wall 24 of the pit when extended. These plates 22 are adapted to extend radially from

the drum, on the descending side of the latter, and to lie against the surface of the drum on the ascending side, and to secure this result flexible connections, such as chains 26, are attached to the front corners of the plates and are extended rearwardly of the direction of motion of the drum and secured to the periphery of the latter at the base of the succeeding plates. The lengths of these chains are such as to hold the plates in their radial positions. Thus when the plates begin to ascend and after they have passed from the influence of the stream of water, as hereinafter described, the chains will collapse and permit the plates to fold against the drum, and thus have what is known as a "feathering" effect or action.

In the partition 14 and over the downgoing side of the water-wheel is formed an outlet-opening 30, having a slidable closure 31, adapted for operation by a lever 32, pivotally mounted in ears 33 upon the inner face of the front of the hopper and by means of which the slidable closure may be reciprocated. Thus if the closure 31 be moved to open the slot 30 and the apparatus be set to receive a stream of water in the hopper the water will pass downwardly and onto the plates 22 as they successively assume the horizontal position shown in Fig. 4 and will act to rotate the wheel, the water passing downwardly and under the wheel and out through the tail-race opening 34 at the back of the casing. At this time the lowermost plates are held in their distended positions, so that the wheel is not only influenced by the impact against the horizontally-disposed plates, but also by the pressure under the wheel.

In order to adapt the construction for an undershot stream, an inlet-opening 35 is formed in the front of the casing and at the bottom thereof and has a slidable closure or gate 36, which is closed during the operation just described. When, however, the undershot stream is to be used, the gate 36 is raised, and a stream may be led through the opening 35 and into engagement with the plates or buckets. Outwardly-extending wings 37 are fixed at their adjacent edges to the opposite sides of the opening 35 to direct the water therethrough.

Upon the base 5 is fixed an upright 40, hav-

ing a bearing 41 fixed to its upper end, and in which is journaled one end of a double crank 42, having its opposite end journaled in a bearing 43, carried by the adjacent side 5 of the casing 11. Connected with one of the cranks of the double crank is a connecting-rod 44, having its lower end connected with the crank 19 and through the medium of which the crank 42 is rotated from the water-
 10 wheel. Mounted upon the base 5 is also a force-pump 45, the piston 46 of which has connected therewith a connecting-rod 47, having connection with the second crank of the double crank 42, as shown, and thus as the
 15 double crank is rotated the pump will be operated.

In order to form a cushion to absorb the jar incident to the pumping operation, a flexible steel strap 50 is pivotally connected at
 20 one end to the crank 19 and is then curved to place it under tension and is passed through a slot in an upright 51 upon the base 5, and in which slot it is adapted to move with friction. With this arrangement of spring a
 25 steady movement of the mechanism will cause an even sliding of the spring through its slot, but any sudden and uneven movement of the mechanism will act to increase the friction of the spring in the slot, causing it to bend, when
 30 the spring, instead of sliding, will bend, and thus act to retard the quickened motion and prevent the sudden jar.

It will of course be understood that the specific shape of the casing and the arrangement
 35 of the parts of the apparatus may be changed, that materials may be varied, and that the apparatus may be built to conform to various conditions without departing from the spirit of the invention.

40 What is claimed is—

1. The combination with a water-wheel and the shaft thereof provided with a crank, of a

double crank connected with the shaft-crank for operation thereby, a pump having a piston connected with the double crank, an up- 45 right, and a spring-plate connected with the shaft-crank and having slidable connection with the upright said plate being adapted to slide when reciprocated at a normal speed and to bend under the influence of sudden in- 50 creased motion.

2. The combination with a power-wheel and the shaft thereof having a crank, of a double crank having connection with the shaft-crank for operation by the latter, a pump having a 55 piston connected with the double crank, an upright having a slot arranged at an angle to the plane of rotation of the shaft-crank, and a spring-plate pivotally connected with the shaft-crank and slidably mounted in the slot 60 of the upright said plate being adapted to slide when reciprocated at a normal speed and to bend under the influence of sudden increased motion.

3. The combination with a power-wheel 65 having a shaft provided with a crank, of means for conveying motion from the crank, an upright having a slot lying at right angles to the plane of movement of the crank, and a spring-plate pivotally connected with the 70 crank and bent under tension and slidably disposed in the slot of the upright, whereby, as the crank is rotated with a constant motion the plate will slide through the slot when reciprocated at a normal speed and will bend 75 under the influence of sudden increased motion.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN MILES DUVAL BLAND.

Witnesses:

H. E. COURTNEY,
 AUGUST POULNOIS.