(No Model.)

3 Sheets—Sheet 1.

F. G. SARGENT.

WOOL WASHING MACHINE.

No. 521,823. Patented June 26, 1894.

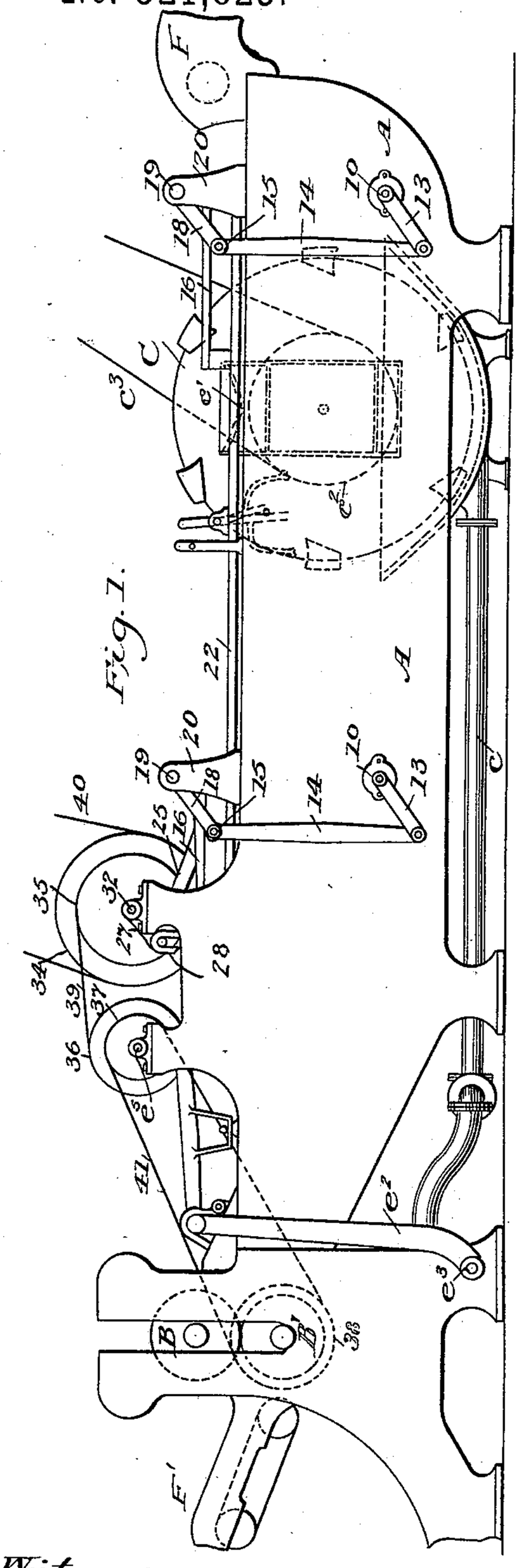

Fig. 1.

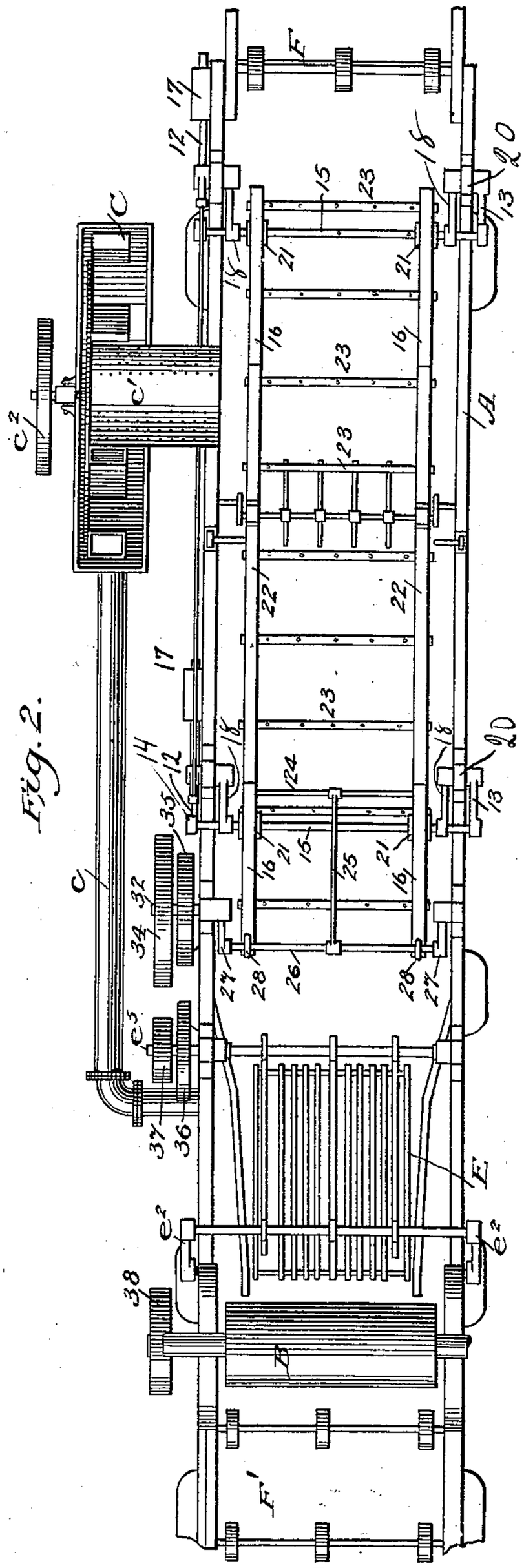

Fig. 2.

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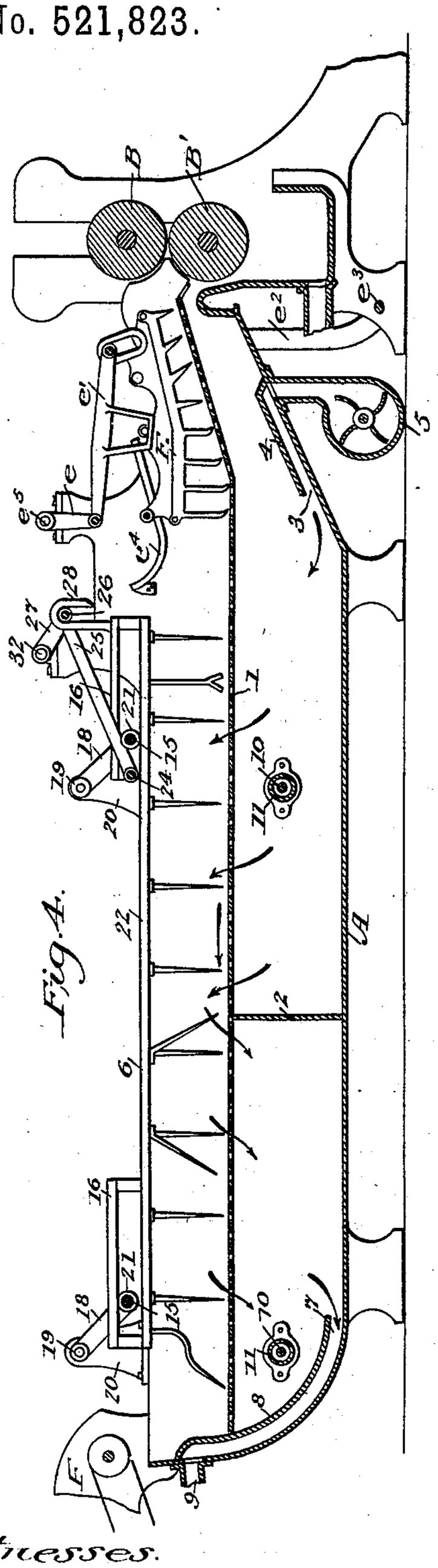

Fig. 4.

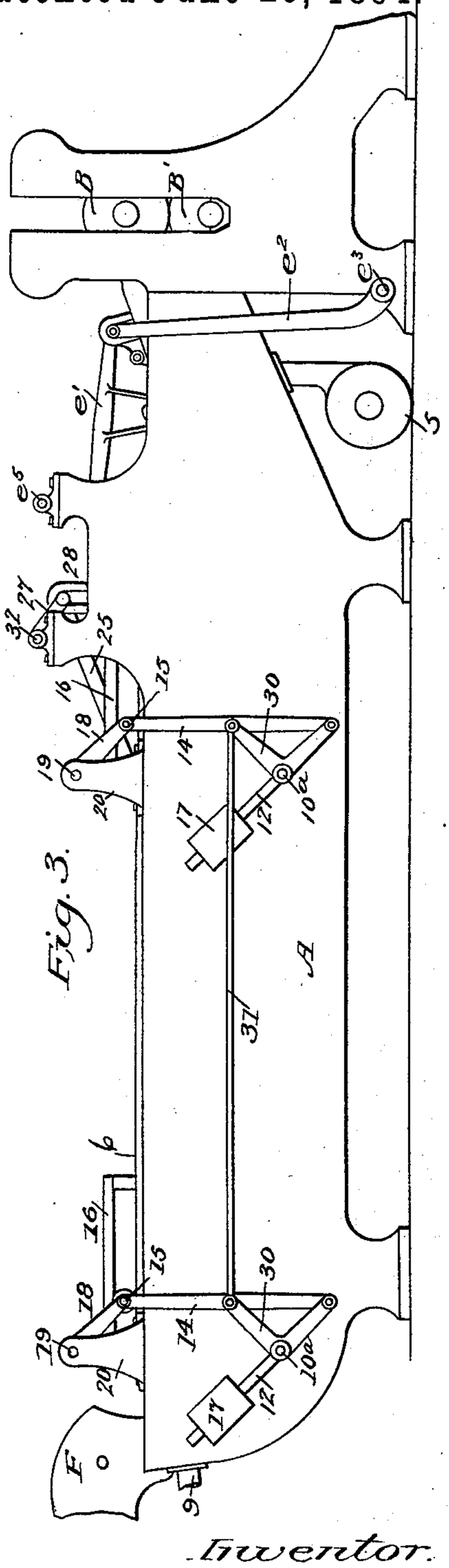

Fig. 3.

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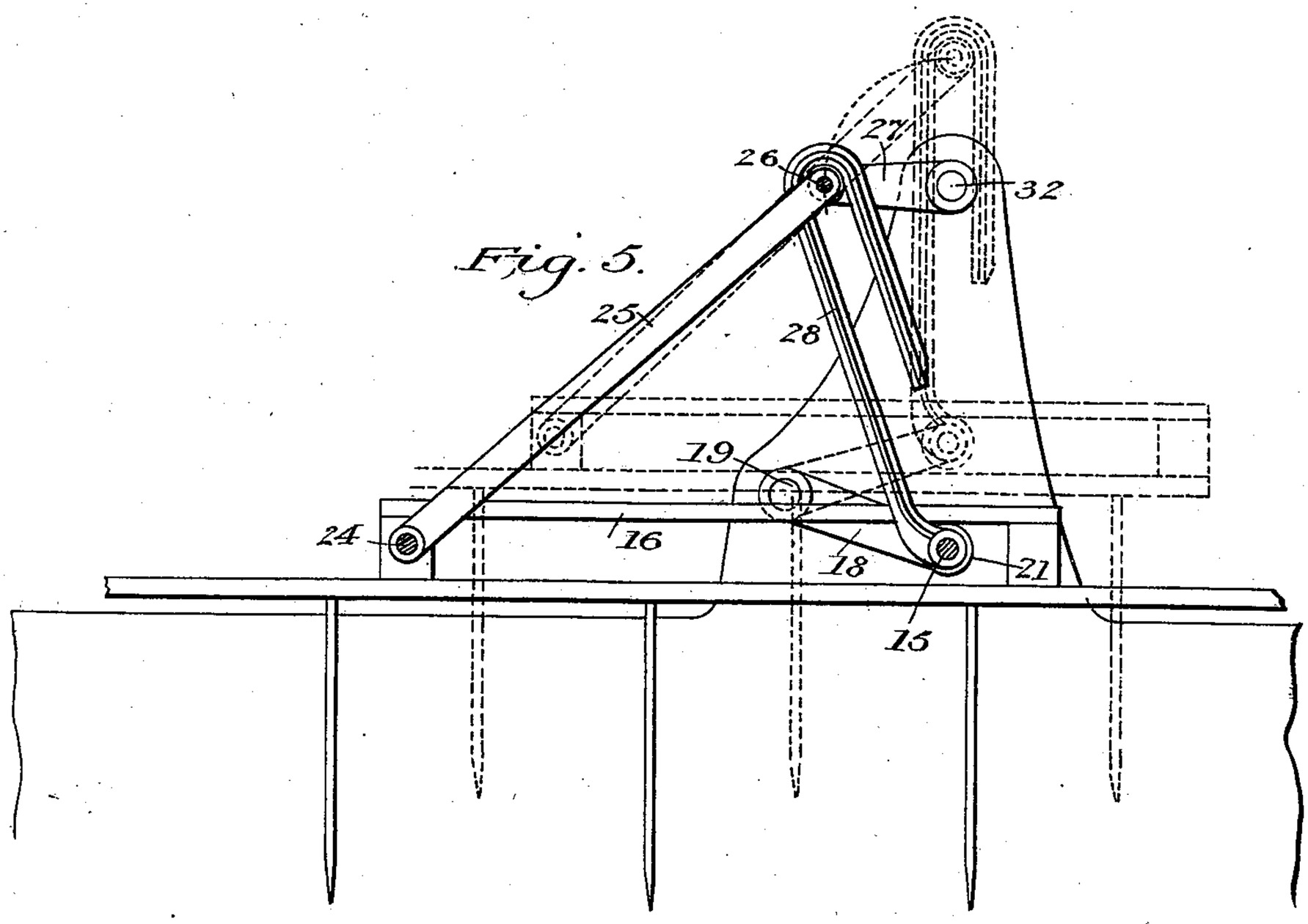
Fig. 5.



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UNITED STATES PATENT OFFICE.

FREDERICK G. SARGENT, OF GRANITEVILLE, MASSACHUSETTS.

WOOL-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 521,823, dated June 26, 1894.

Application filed November 10, 1893. Serial No. 490,593. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK G. SARGENT, of Graniteville, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Fiber-Washing Machines, of which the following is a specification.

My invention relates to machines for washing or scouring wool and other fibers, and it consists in certain new and useful constructions and combinations of the several parts thereof, substantially as hereinafter described and claimed.

In the drawings: Figure 1 is a side elevation of a fiber washing machine provided with my improvements, and with a bucket wheel for transferring the fluid from one part of the machine to another. Fig. 2 is a top plan view of the same. Fig. 3 is a side elevation of the opposite side of the machine, with the bucket wheel left off and the arrangement of the pivots of the weighted arms as hereinafter described. Fig. 4 is a longitudinal vertical section through the machine, showing the arrangement of the parts within the bowl. Fig. 5 is an enlarged detailed view of a modification of the link and pitman mechanism which operates the harrow.

A is the bowl of the machine.

F is a portion of the feed-in apron.

B, B′ are the squeeze rolls.

F′ is the feed-out apron, which carries the wool away from the squeeze rolls.

C is a bucket wheel working in a trough, which lifts the liquid flowing into the trough from underneath the squeeze rolls through the pipe, *c*, and delivers it through the spout, *c′*, back into the bowl near the feed-in end.

The bowl is provided throughout its length with the perforated false bottom, 1, through which the dirt is enabled to settle to the bottom of the bowl in the usual manner. About midway of the false bottom the transverse partition, 2, extends across the bowl from side to side and fills the entire space between the true and false bottom. An inlet passage, 3, near the feed-out end of the bowl is formed under the shield 4, to which is connected the pump, 5, by a suitable pipe, so arranged that the washing liquid may be driven into the bowl through the passageway, 3, by the action of the pump. The liquid flowing along the bottom of the bowl reaches the solid partition, 2, which forces it up through the false bottom, 1, whence flowing against the direction of the wool carried by the harrow, 6, through the bowl the liquid flows downward again through the false bottom, 1, on the feed-in side of the partition, 2, and thence flows out of the bowl through the passageway, 7, under the shield, 8, and through the outlet pipe 9. This movement of the washing fluid possesses a great advantage over its ordinary effect in the bowl, because when the wool first enters the bowl at the feed-in end by the feed apron, F, as soon as it enters the washing fluid the heavier particles of dirt in the wool drop out of it and downward upon the perforated false bottom 1. Ordinarily some of this dirt is carried along on top of the false bottom and becomes mixed with the wool near the feed-out end and is squeezed into it again by the squeeze rolls B, B′. By having the current constantly flowing downward through the perforated bottom near the feed-in end, the particles of dirt removed from the fiber in its first soaking are substantially all sucked downward through its perforations and cannot again become mingled with the fiber. The arrows show the direction taken by the washing fluid in thus flowing upward and downward through the perforated false bottom as described.

The carrier, E, carries the fiber up the inclined part of the false bottom and delivers it to the squeeze rolls. It is suspended on the swinging arms, e^2, which are pivoted at e^3 at their lower ends. The carrier moves at its other end on the ways, e^4, and is driven and lifted and dropped by the crank, *e*, and pitman, *e′*, in the usual manner. The harrow, 6, is however provided with an improved mode of suspension for counterbalancing it, in order to have the counterbalancing weights exert at all times an equal pressure or counterbalancing action on the harrow. Two shafts, 10, 10, are supported in tubes, 11, 11, extending through the bowl from side to side underneath the false bottom. On these shafts, 10, 10, are attached the arms, 12, 12, on one side of the bowl and 13, 13, on the opposite side of the bowl. The arms might be suspended upon studs 10^a projecting from the

outside of the bowl on each side, if desired, as shown in Fig. 3, instead of having the shafts, 10, run through the bowl, but I prefer the latter construction; or the bowl might be set on higher feet and the shafts run under instead of through it.

It will be noticed that the arms 12, 12, are attached to the shafts near their middle portion while the arms, 13, 13, are attached at one end and correspond with only one half of the arms 12. These shafts, therefore, act as rock shafts carrying the arms with them as they revolve. The corresponding portions of the arms 12 and 13 have at their outer ends the links, 14, 14, attached to them, which extend upward and are attached at each end of the cross rods, 15, 15, on which the harrow moves back and forth by means of the straps, 16, 16, attached to the harrow, so as to form slots between them and the top bars of the harrow, through which the rods, 15, pass.

On the free ends of the arms, 12, are attached the weights 17, 17, which are arranged so as to counterbalance the weight of the harrow. In order to hold the rods, 15, in place while the harrow slides to and fro upon them, these rods are pivoted to the rocker arms, 18, 18, which are themselves pivoted at 19 to the upright brackets, 20, attached to the sides of the bowl. As the rods 15 rise and fall the rocker arms 18, 18, keep them from moving in a direction longitudinal to the bowl away from the path of the rocker arms. The cross rods, 15, on which the harrow moves to and fro are provided with enlargements, 21, which may be in the form of rollers to relieve the friction as the straps, 16, 16, move to and fro over them.

By the above described construction it will be observed that the weights, 17, 17, exercise the same counterbalancing effect upon the harrow, whatever position it and they may be in. For example, in the position shown in Fig. 3 the weights being above the pivots 10^a, 10^a, exercise less pressure upon the links, 14, than they do when the arms 12, 12, are horizontal, but the harrow is in a position with relation to the rocker arms, 18, 18, which causes it to exercise a proportionately less pressure upon the rocker arms and links, 14, to that of the weights. When the rocker arms, 18, are horizontal the weighted arms, 12, are also horizontal and the consequent greater pressure of the counterbalancing weights upon the lower ends of the links, 14, is met by a correspondingly greater pressure of the weight of the harrow upon the upper ends of the links, 14, and the same will be found true for any intermediate position of the counterbalancing weights and harrow. It will be understood, of course, that it is intended that the harrow shall be lifted and moved backward on its return motion and dropped upon the wool in the bowl; and moved forward on its opposite motion.

The harrow is composed of the side girts, 22, with cross bars, 23, armed with teeth projecting downward in the usual manner to carry the fiber forward in the bowl. To a cross rod, 24, attached to the harrow is connected the pitman, 25. The other end of the pitman is connected to the long crank pin, 26, of the cranks 27, 27. Attached to each of the side rails are the hook-shaped links, 28, 28, which extend upward over the crank pin 26. As the crank moves around it lifts the harrow by the links, 28, and moves it back and forth by the pitman 25. It will be observed that the links, 28, are wide enough to allow the crank pin to move up and down in them while the harrow is being moved forward and before it has reached the position shown in Fig. 4 long crank pin, 26, moves freely down and up in the link without lifting the harrow; but when the position shown in Fig. 4 is reached the crank pin 26 has moved upward to the point in the links, 28, where it begins to lift the harrow by means of the links. The pitman is merely an auxiliary of the links 28 and relieves them of strain and wear in moving the harrow to and fro. To the sides of the arms 12, 12, are attached short arms, 30, 30, (Fig. 3) projecting at right angles and the outer ends of these arms have pivoted to them the horizontal link, 31. This arrangement insures the equal movement of both arms 12, and weights, 17, in lifting the harrow up and down. This method of counterbalancing the harrow is greatly superior to that shown in my Patent No. 507,333, of October 24, 1893. The device there shown is in effect a counterbalancing of the harrow by means of a weight connected to one pair of the rocker arms on which the harrow rests, and which arms are connected by rods to the arm upon which the other end of the harrow rests, so that the two arms move in unison. All the strain of the harrow upon the last-named arm is communicated through the connecting rod to the first arm, and this involves wear and tear of the mechanism. With my present arrangement the weight of each half of the harrow is counterbalanced directly by the mechanism connected to the arm on which that half of the harrow rests, and no strain is communicated through the connecting rod, except the slight strain resulting from any tendency of one end of the harrow to move faster or slower up and down than the other end moves. Thus the mechanism is relieved of wear and is sure to run smoothly and without effort. In Fig. 5 the construction is changed by pivoting the links 28 to the cross rod, 15, of the rocker arm 18. The pitman, 25, is also made considerably shorter. The crank, 27, is thus made to fit the link, 28, more closely than in the first construction. The rocker arms 18 at the feed-out end of the carrier are also transferred to the brackets, which sustain the crank 27. There are several advantages in this arrangement. As the crank continues to descend from the position shown by the full lines, the harrow is thrust back horizontally a short distance, against

the direction of the incoming wool, then quickly stopped and drawn in the contrary direction. The wool is thus violently agitated, so that the dirt is the more readily disengaged from it and carried down through the false bottom by the current of liquid moving as above described. Again, the links, 28, 28, lift the harrow with less strain to it than if they were attached directly to it.

The mechanism of the machine is actuated as follows:—The bucket *c* is driven by a belt, c^3, leading from any suitable countershaft over the pulley c^2. The shaft, 32, on which the crank 27 is centered, has attached to its outer end a pulley, 34, which is belted to any suitable countershaft by the belt 40. On the shaft 32 is also the pulley 35, which is belted by the belt, 39, to the pulley, 36, on the shaft e^5, which bears the crank *e*. In like manner, by a pulley 37 on the shaft, e^5, and the belt, 41, power is transmitted to the pulley, 38, on the end of the bearing of the lower squeeze roll B′.

What I claim as new and of my invention is—

1. The combination with the bowl of the wool washing machine, of the perforated false bottom, 1, the cross partition, 2 dividing the bowl beneath the false bottom into two portions, the fluid inlet passage, 3, underneath the false bottom near the feed-out end of the machine, the fluid outlet passage, 7, on the opposite side of the partition 2 near the feed-in end of the machine, and means whereby the washing fluid may be forced through the inlet passage, 3, up through the false bottom on one side of the partition 2 along over the false bottom in a direction contrary to that of the progress of the fiber through the bowl and down through the false bottom and out through the outlet, 7, on the opposite side of the partition 2, substantially as described.

2. The combination of the harrow, 6, suspended upon the rocker arms 18, at their outer end and arranged to move to and fro thereon, the weighted arms, 12, pivoted to the bowl and provided at one end with the counterbalancing weight, 17, and connected at their other ends with the rocker arms, 18, by the pivoted links, 14, 14, the whole being so arranged that the varying pressure of the counterbalancing weight on the arms, 12, due to their upward and downward motion shall correspond with the varying pressure of the harrow on the rocker arms, 18, due to their upward and downward motion, substantially as described.

3. The combination of the harrow, 6, suspended upon rocker arms, 18, at their outer end and arranged to move to and fro thereon, the rotating crank, 27, connecting with the harrow by a pitman, 25, pivoted to the said harrow, and the link, 28, pivoted at its lower end to the rocker arms, 18, and having a slot at its upper end embracing the wrist pin of the crank 27, substantially as described.

4. The combination of the harrow, two or more counterbalancing mechanisms acting upon different portions (longitudinally reckoned) of the same, and means of connection between the said counterbalancing mechanisms so arranged that the said counterbalancing mechanisms shall act in concert.

5. The combination of the harrow, two or more counterbalancing mechanisms acting upon different portions (longitudinally reckoned) of the same, and a link connecting the said counterbalancing mechanisms so arranged that the said counterbalancing mechanisms shall act in concert.

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