

(No Model.)

4 Sheets—Sheet 1.

F. G. SARGENT.  
WOOL WASHING MACHINE.

No. 507,333

Patented Oct. 24, 1893.

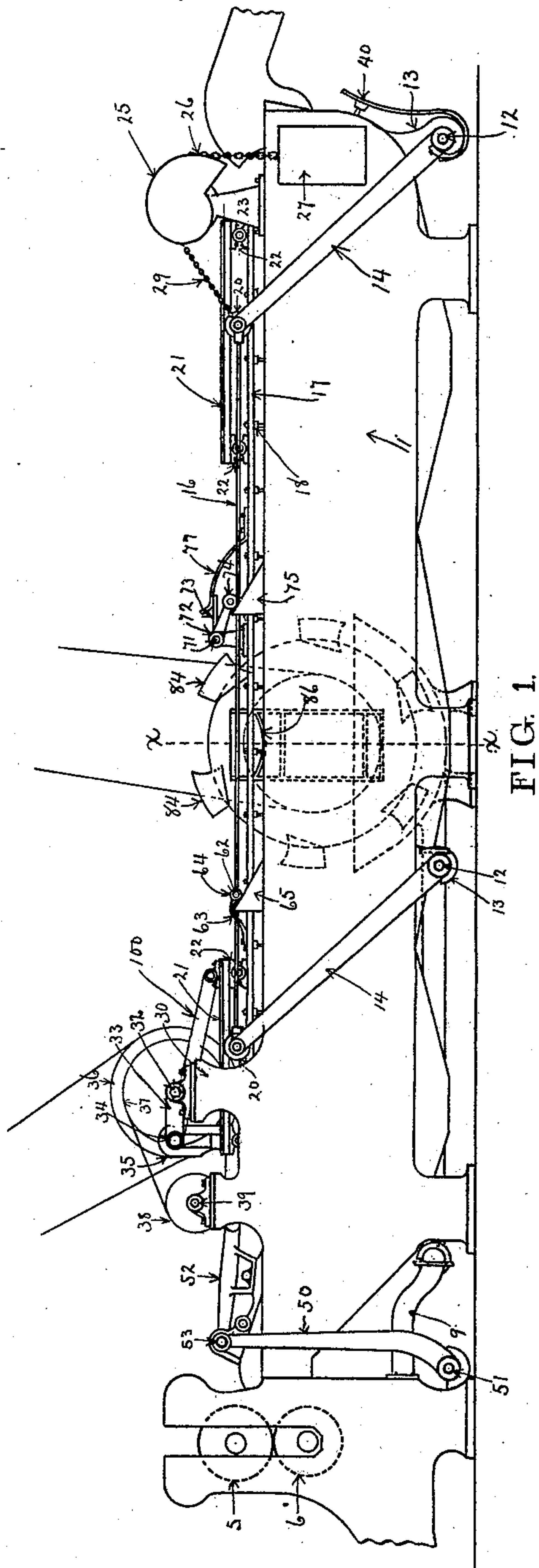


FIG. 1.

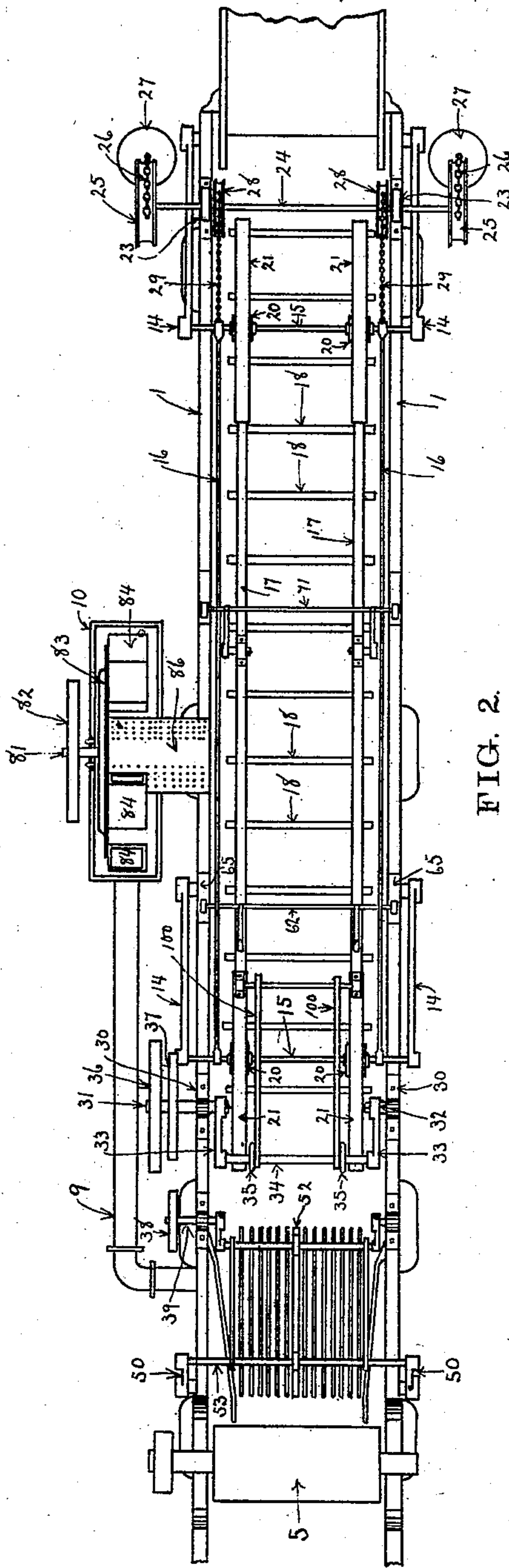


FIG. 2.

Witnesses.  
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By David Hall Rice  
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(No Model.)

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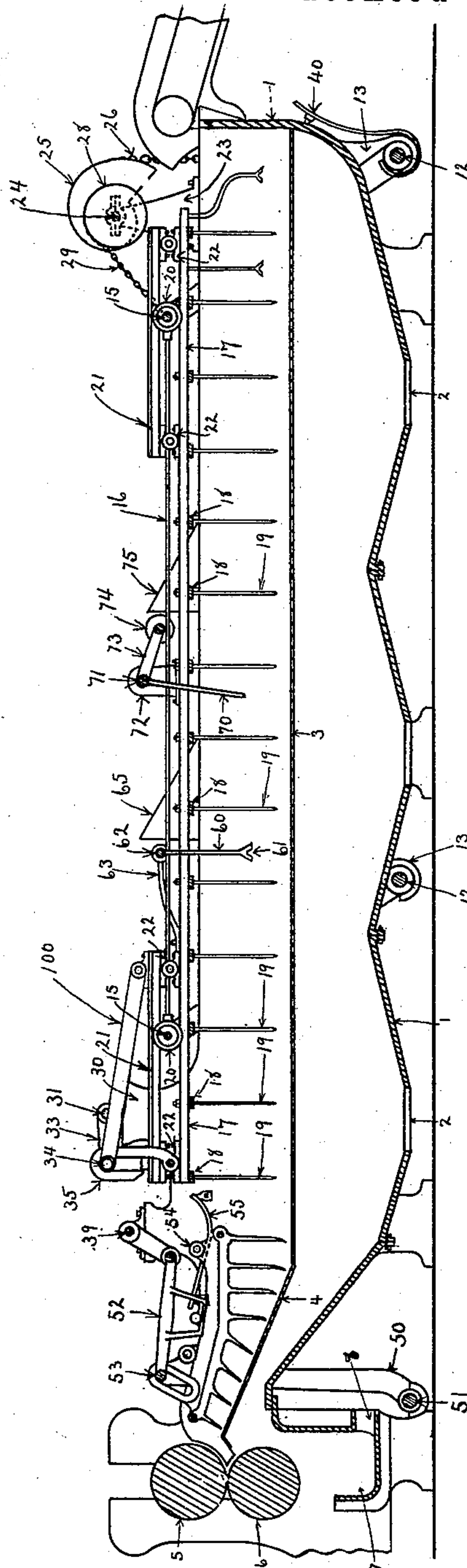


FIG. 3.

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4 Sheets—Sheet 3.

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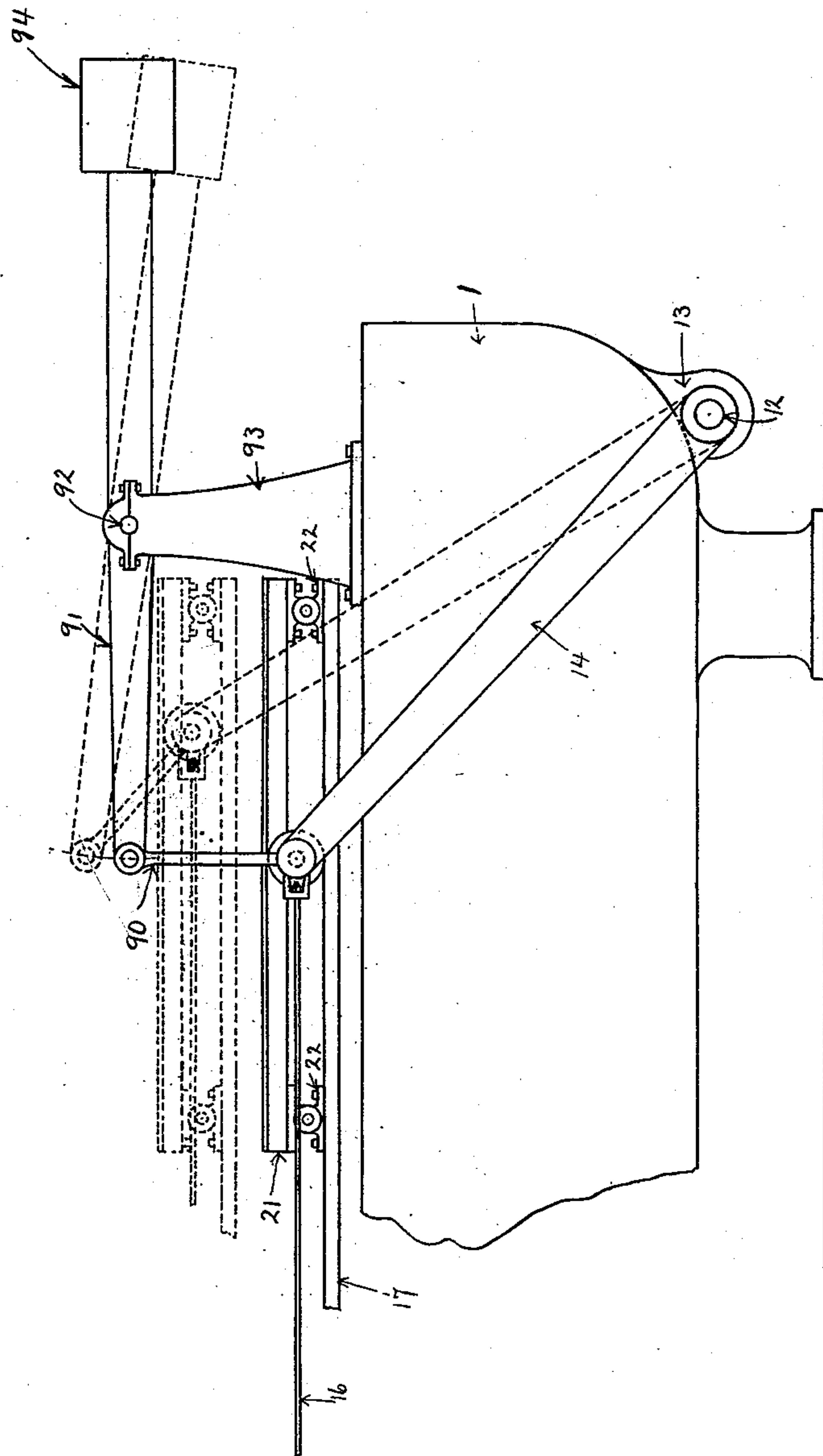


FIG. 4

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(No Model.)

4 Sheets—Sheet 4.

F. G. SARGENT.  
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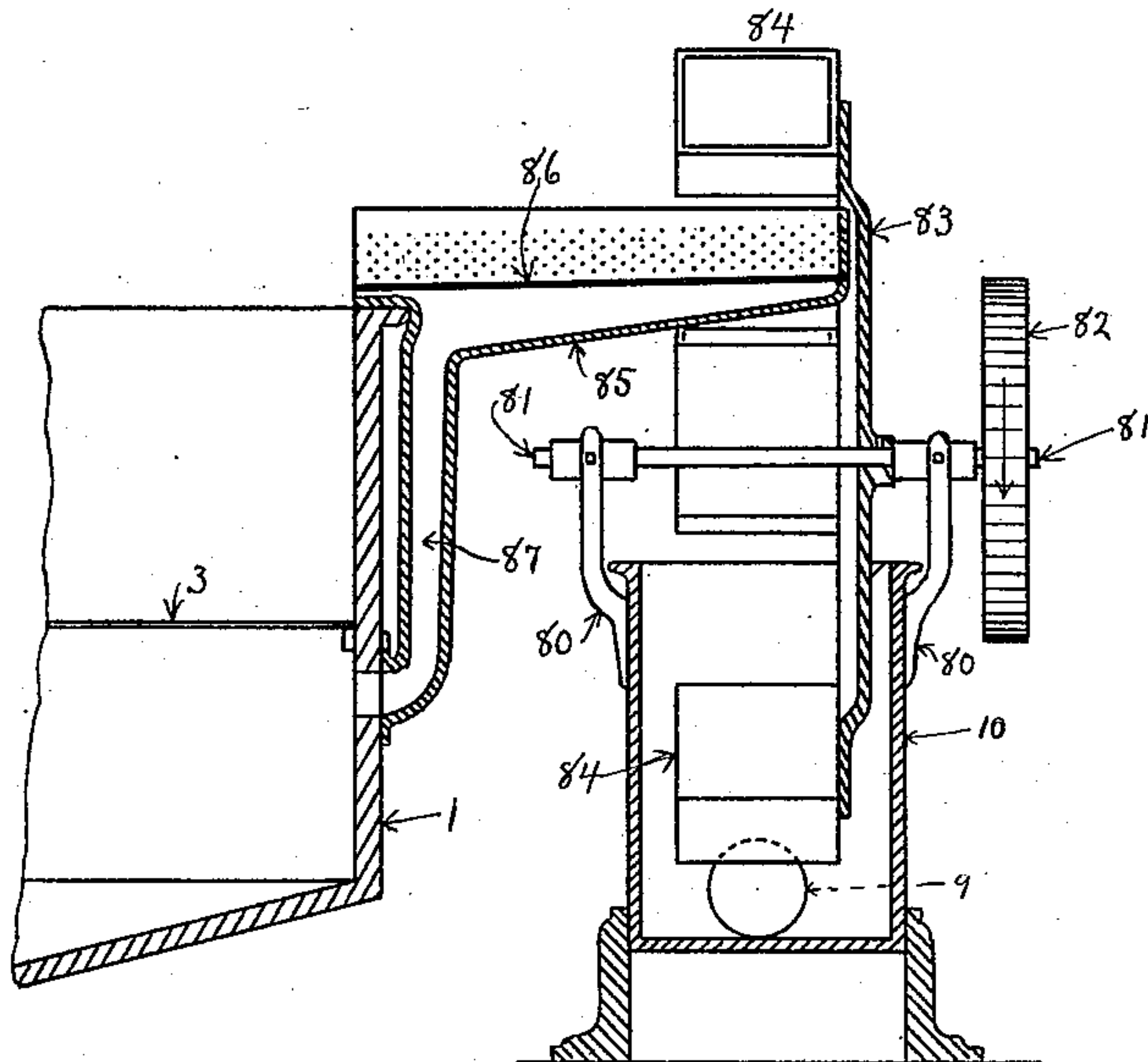


FIG. 5.

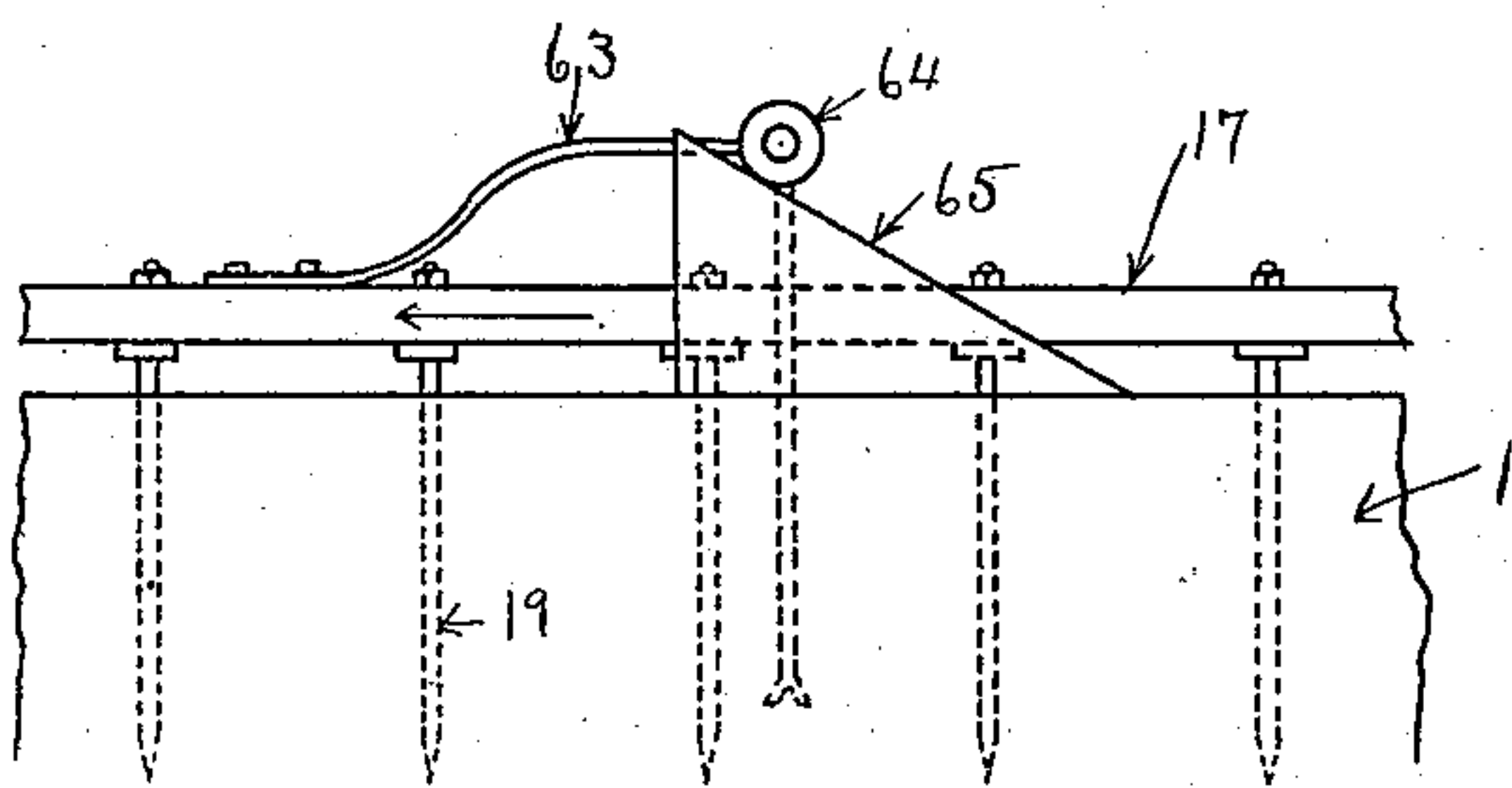


FIG. 6.

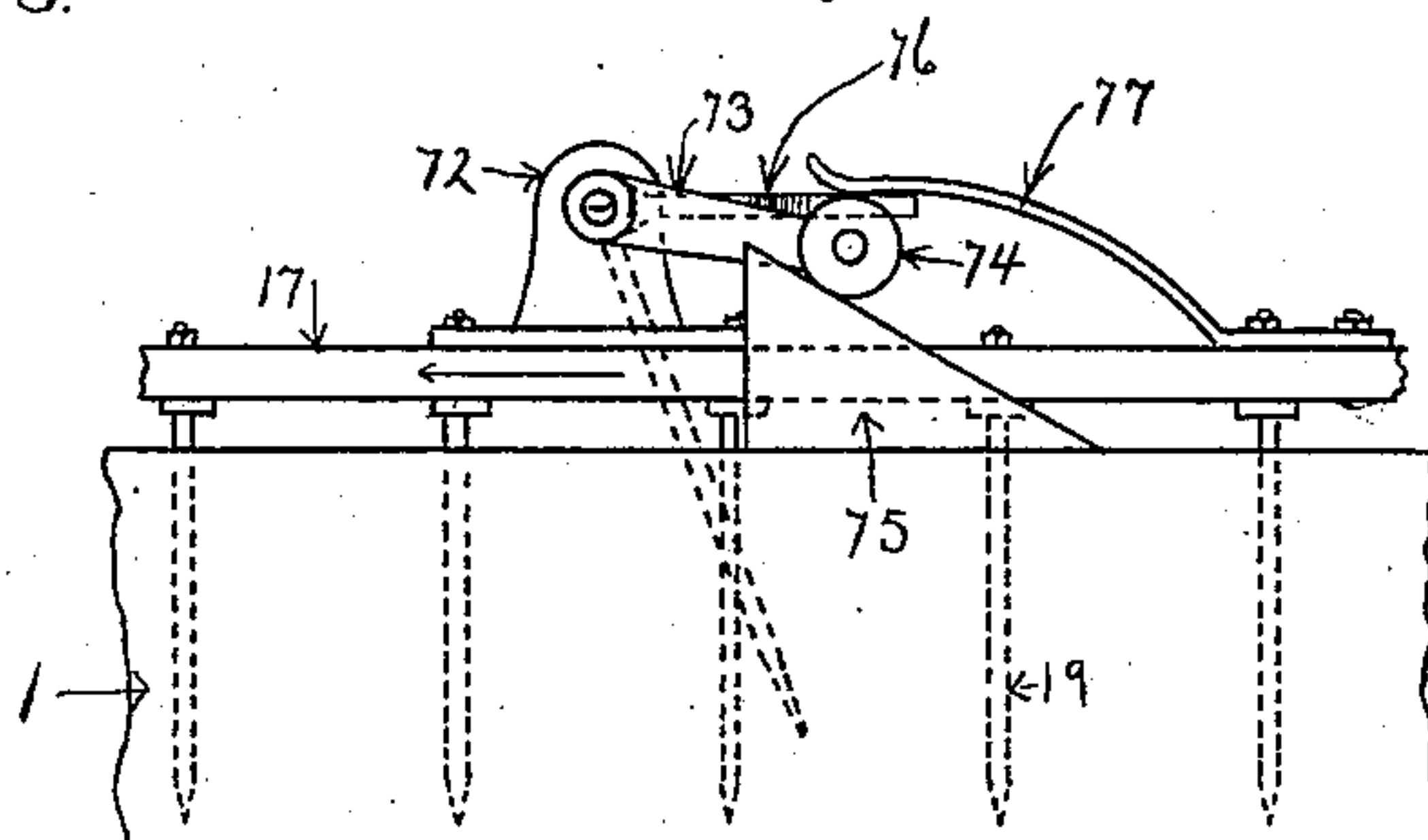


FIG. 8.

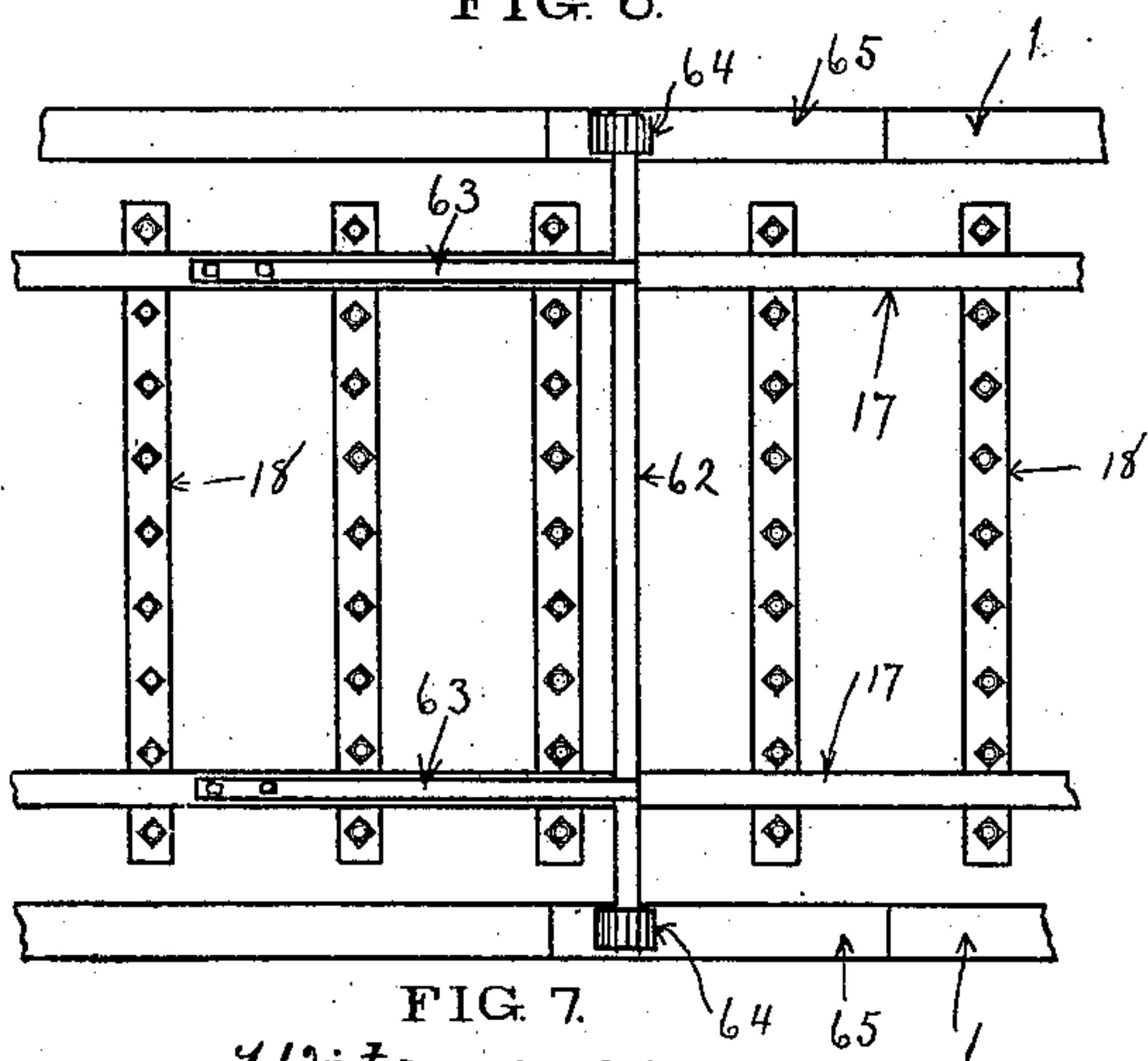


FIG. 7.

Witnesses.

N. P. Ockington  
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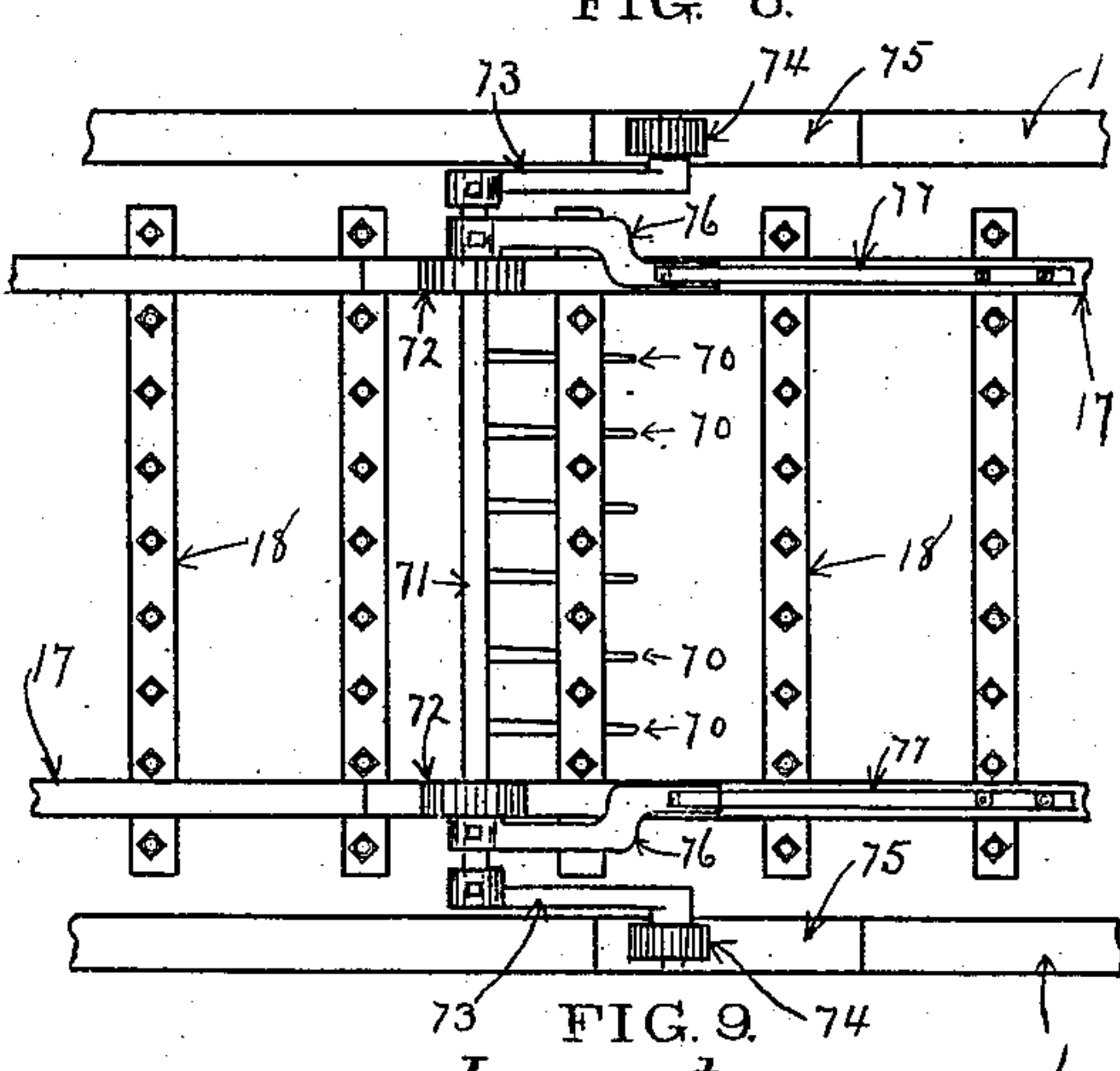


FIG. 9.

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# UNITED STATES PATENT OFFICE.

FREDERICK G. SARGENT, OF GRANITEVILLE, MASSACHUSETTS.

## WOOL-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 507,333, dated October 24, 1893.

Application filed December 21, 1892. Serial No. 455,942. (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 Wool-Washing Machines, of which the following is a specification.

My invention relates to wool-washing machines, and it consists in certain new and improved 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 wool-washing machine provided with my improvements. Fig. 2 is a top plan view of the same. Fig. 3 is a longitudinal central section of the same. Fig. 4 is an enlarged view of the end of the machine in side elevation, provided with a modification of the counterbalancing apparatus for the harrow. Fig. 5 is an enlarged transverse section of a portion of the machine on the dotted line  $x-x$  of Fig. 1. Fig. 6 is an enlarged side elevation of a portion of the machine, showing the details for operating the ducker. Fig. 7 is a top plan view of the same. Fig. 8 is an enlarged side elevation of another portion of the machine, showing the mode of operating the vibrating agitator. Fig. 9 is a top plan view of the same.

The bowl of the machine, 1, is supported on feet and provided with escape openings, 2, 2, in its bottom for drawing off the liquid. It is also provided with a perforated false bottom, 3, at some distance below the fluid level, the delivery end, 4, of which inclines upward to form the bed for the carrier to convey the fiber to the squeeze rolls, 5, 6, from which the wool is delivered in the usual manner. Underneath the squeeze rolls is the trough, 7, to receive the fluid which is squeezed out of the wool by the rolls, which fluid contains small fibers of wool, and this trough has an outlet, 8, at its bottom to which the pipe, 9, is connected which leads to the reservoir, 10, from whence the fluid is elevated and delivered with the wool fibers back into the bowl by a bucket wheel, substantially as hereinafter described.

Underneath the bowl, 1, are the cross shafts, 12, attached to the bowl by boxes or bearings, 13, 13. These cross shafts 12 have attached

to each end of each of them the swinging arms, 14, 14, which extend upward on each side of the bowl and have their upper ends connected together by the cross bars or rods, 15. These rods are again connected to each other by the horizontal rods or links, 16, 16, at each side of the bowl so that the motion which is given to one pair of the swinging arms, 14, turning on their shaft 12, will be communicated to the other pair of arms, 14, turning on their shaft 12, and the motion of the cross rods 15, as the arms are brought to a vertical position, will be upward from the top of the bowl and vice versa.

On the rods 15 the harrow, which conveys the wool through the bowl, is mounted in the following manner:—The harrow consists of two longitudinal bars, 17, 17, connected together by cross bars, 18, 18, and from the latter the teeth 19, 19, project downward so as to engage with the fiber and convey it through the liquid in the bowl when the harrow is moved forward. The transverse rods, 15, pass across the tops of the longitudinal bars, 17, of the harrow and where they come against these bars the rods are provided with grooved rollers, 20, 20, which revolve upon them and fit the bars 17 in their grooves. Directly over the top sides of these grooved rollers the longitudinal bars, 21, 21, are bolted to blocks, 22, at each end, which blocks are themselves bolted to the upper sides of bars 17 so as to form guideways between the bars 17 and 21 of sufficient length to allow for the requisite longitudinal movement of the harrow forward toward the squeeze rolls in the operation of the machine substantially as hereinafter described. Near the feed-in end of the bowl the uprights, 23, 23, are attached to it on each side, and the shaft, 24, is mounted in boxes at the upper ends of these uprights and extends across the bowl and carries on its outer ends the grooved cams, 25, 25. In the grooves of these cams are attached the chains, 26, 26, which have attached to their lower ends the weights, 27, 27. Just inside of the sides of the bowl are attached two grooved pulleys, 28, 28, and the chains, 29, 29, are attached at one end in the grooves of these pulleys and at the other end to the cross rod, 15, of the harrow and the weights, 27, 27, are thus made to nearly, or a little



more than counterbalance the weight of the harrow, and to assist in swinging the levers 14, 14, upward in lifting the harrow out of the washing fluid.

5 The lifting motion and longitudinal motion is given to the harrow in the following manner:—Two uprights, 30, 30, are attached to the sides of the bowl and in these are mounted crank shafts, 31, 32; directly opposite to each  
10 other carrying the cranks, 33, which are connected at their outer ends by the single wrist pin, 34, extending across the machine from one to the other. Two links, 35, 35, are attached to the bars, 17, 17, of the harrow and extend  
15 upward from the latter so as to embrace the wrist pin, 34, of the cranks 33. The slots in these links are so proportioned that the cranks only raise the harrow in their movement from a horizontal position in one direction  
20 over to a horizontal position in the other direction, and then the wrist pin travels downward and upward in the links and merely moves the harrow horizontally along on the guide bars, 21, over the rollers 20 of the cross  
25 bars, 15, giving a direct horizontal and forward movement to the harrow toward the carrier and squeeze rolls during the lower half-revolution of the cranks, 33, and giving a lifting and backward motion during the  
30 upper half-revolution of the cranks. In order to relieve the strain on the links, 35, a pitman, 100, is also attached to the wrist pin at one end and pivoted to the harrow at the other, but if desired the links, 35, can be employed alone by making them heavy enough  
35 to endure all the strain of the crank. The links are made open enough to allow the pitman, 100, to swing up and down in them. A single link, 35, may be employed in place of  
40 two, as it will perform the same functions if made strong enough. This lifting and backward movement and horizontal forward movement of the harrow by the crank causes the levers, 14, 14, to swing upward on the back-  
45 ward movement and sustain the harrow at both ends while moving backward, and to also swing downward in the first part of the forward movement and then to remain stationary and support the harrow while it moves  
50 horizontally forward. When the levers 14 move downward to the position where they remain stationary while the harrow moves forward horizontally upon them, they are checked by the spring, 40, which is attached  
55 to the shaft, 12, at the feed-in end of the machine and comes against the end of the bowl, 1, so as to arrest the downward movement of the levers as described and the spring, 40, thus forms an elastic stop for this purpose,  
60 although if preferred, a rigid arm may be used in place of the spring to perform this function.

The crank shaft, 31, is driven by the pulley, 36, on its outer end and another pulley,  
65 37, is attached to the crank shaft, which belts to another pulley, 38, on the end of crank shaft, 39, and this crank shaft drives the car-

rier which is hung at its forward end upon the swinging arms, 50, 50, which are pivoted upon the transverse shaft, 51, underneath the  
70 bowl in the usual manner. The wrist pin of the crank shaft, 39, passes through the swinging arm, 52, which is pivoted to the rod, 53, and lifts and controls the carrier in the usual manner. In its upward movement the rear  
75 end of the carrier is provided with rollers, 54, which engage with and travel up the guide-ways, 55, that are attached to the inside face of the bowl.

The harrow is provided with a ducker plate, 80 60, having a forked lower edge, 61, which catches the wool underneath it as the ducker plate is raised and submerges it underneath the washing fluid. The ducker plate is attached to the shaft, 62, which is mounted on  
85 the springs, 63, attached to the longitudinal bars, 17, 17, of the harrow. The shaft, 62, extends at each end over the sides of the bowl, 1, and has small rollers, 64, 64, on these ends in the planes of the sides of the bowl. On  
90 the sides of the bowl are attached the cam plates, 65, 65, in position for these rollers to travel over them as the harrow moves horizontally forward, which plates lift up the shaft, 62, and the ducker plate, 60, and drop  
95 it vertically after the rollers have passed over the cam plates, 65. By this action the wool coming under the ducker is soused downward into the fluid as the harrow moves forward. As many of these duckers may be attached to  
100 the harrow as are necessary for the thorough sousing of the wool. The harrow is also provided with an agitator, consisting of a row of teeth, 70, 70, extending transversely across the bowl and attached to the rock shaft, 71.  
105 This rock shaft is mounted in bearings, 72, on the bars, 17, of the harrow and attached to its outer ends are the arms, 73, which have studs projecting transversely over the sides of the bowl, on which are mounted rollers, 74, 74.  
110 These rollers are arranged to engage with the cam plates, 75, 75, attached to the sides of the bowl, so as to vibrate the rock shaft, 71, as the harrow moves horizontally forward. One cam plate, 75, may be dispensed with and the other  
115 alone used to operate the agitator, if desired, as it will do the work.

The rollers may be made heavy enough to vibrate the rock shaft and agitate the washing fluid and fiber to the desired extent, but  
120 if desired, the arm, 76, may be attached to the rock shaft, and the spring, 77, attached to one of the bars 17 be made to bear upon the arm so as to hold the teeth, 70, vertical or nearly  
125 so. The cam plates, 75, will then move the rock shaft and teeth in one direction and the spring, 77, will throw them in the other direction, thus producing the desired agitation.

In order to insure the return of the washing fluid and fiber, which flows into the reser-  
130 voir, 10, to the bowl with the best advantage, I have devised a separating device which shall separate the larger portion of the fluid from the fiber and cause the latter to be delivered



into the upper part of the bowl above the false bottom, 3, while the larger portion of the fluid is delivered below the false bottom in the following manner.

5 On the sides of the reservoir, 10, are attached upright supports, 80, 80, in which is mounted the shaft, 81, driven by the pulley, 82, on its outer end. This shaft supports a circular plate or disk, 83, from which the buckets, 84, project inward toward the bowl, being so arranged as to revolve downward into the reservoir, 10, and dip up the fluid and floating fiber and carry it up and dump it into the trough, 85, which projects under the buckets above the shaft 81. This trough has a false bottom, 86, of concave form and is perforated on each side of the concave. This false bottom inclines downward over the upper edge of the bowl and when the washing fluid and floating wool fibers are dumped onto it the fibers sink to the middle portion of it and slides downward over the unperforated surface into the bowl of the machine, while the larger portion of the washing fluid flows through the perforations of the false bottom and escapes through the passageway, 87, (Fig. 5) into the bowl below the false bottom 3. The floating fibers of the wool being thus delivered into the bowl over the top edge with a comparatively small amount of the washing fluid, mingle with the wool fibers passing through this part of the bowl and become attached to them and are thus taken up and delivered through the squeeze rolls to better advantage.

35 Instead of using the chains and cams for counterbalancing the harrow I may make use of the modification shown in Fig. 4, as follows:—To one of the arms, 14, is pivoted the link, 90, which at its upper end is pivoted to the horizontal lever, 91. This lever is supported upon the rock shaft, 92, mounted in boxes at the upper end of standard, 93, which is attached to the side of the bowl 1. At the opposite end of the lever, 91, is attached the weight, 94, which is arranged to counterbalance the harrow. The position of the harrow and lever at its upper point of movement is shown by dotted lines. The harrow moves back and forth upon its guide rollers in the same manner as before described and its construction in other parts is substantially the same.

50 It is evident that the rods, 16, 16, which connect the two pairs of swinging arms, 14, may be dispensed with and the movements of the two pairs of arms be communicated to them by the harrow, if desired, but the rods 16 give greater steadiness of motion and save a considerable amount of wear upon the guideways, 21, of the harrow and I, therefore, prefer to use them. It is also evident that the ducker, 60, may be operated by one cam plate, 65, if desired, instead of having two arranged on opposite sides of the bowl, but its operation by means of two is the preferred construction.

What I claim as new and of my invention is—

1. In a fiber washing machine, the combination of the bowl, two pairs of levers 14, 14, 70 mounted on pivots at their lower ends, each pair connected at their upper ends by a cross shaft across the top of the bowl, and a harrow mounted upon said cross shafts and arranged to be moved up and down with the pivoted levers, and counterbalancing mechanism mounted on a separate shaft and connected to said harrow substantially as described.

2. In a fiber washing machine, the combination of two pairs of levers 14, 14, mounted 80 on pivots at their lower ends, each pair connected at their upper ends by a cross shaft across the top of the bowl, and a harrow mounted upon guideways on said cross shafts and arranged to be moved up and down with the pivoted levers and to slide to and fro horizontally on said guideways, and counterbalancing mechanism mounted on a separate shaft and connected to said harrow substantially as described. 90

3. In a fiber washing machine, the combination of the bowl, two pairs of levers 14, 14, mounted on pivots at their lower ends, each pair connected at their upper ends by a cross shaft across the top of the bowl, a longitudinal rod, 16, connecting both pairs of said levers together pivotally, and a harrow mounted upon guideways on said cross shafts and arranged to be moved up and down with the pivoted levers and to slide to and fro on said guideways, and counterbalancing mechanism mounted on a separate shaft and connected to said harrow substantially as described. 95 100

4. In a fiber washing machine, the combination of a bowl, two pairs of levers 14, 14, 105 mounted on pivots at their lower ends, each pair connected at their upper ends by a cross shaft across the top of the bowl, a harrow mounted upon guideways on said cross shafts, provided with the link, 35, and arranged to be moved up and down with the pivoted levers and to slide to and fro on said guideways, the crank and crank shaft, 33, 31, arranged to engage with said link and move the harrow to and fro and up and down, and 110 115 counterbalancing mechanism connected to one pair of said levers and arranged to counterbalance the weight of the harrow, substantially as described.

5. In a fiber washing machine, the combination of the bowl, two pairs of levers 14, 14, 120 mounted on pivots at their lower ends, each pair connected at their upper ends by a cross shaft across the top of the bowl, and both pairs connected together by a longitudinal connection so that they move together when one is moved, a harrow mounted upon guideways on said cross shafts provided with the link, 35, and arranged to be moved up and down with the pivoted levers, and to slide to and fro on said guideways, the crank and crank shaft, 33, 31, arranged to engage with 125 130



said link and move the harrow to and fro and up and down, and counterbalancing mechanism connected to one pair of said levers, and arranged to counterbalance the weight of the harrow substantially as described.

5 6. In a fiber washing machine, the combination of the bowl, provided with a cam plate, 65, attached to it, the harrow arranged to move horizontally to carry the wool forward  
10 toward the squeeze rolls and to be lifted up and carried backward above the bowl, and the ducker, 60, attached to the harrow by a yielding connection arranged to bring the ducker into contact with the cam plate on the  
15 forward movement of the harrow and lift it vertically up and down and to carry it clear of the cam plate on the backward movement of the harrow, substantially as described.

20 7. In a fiber washing machine, the combination of the bowl provided with a cam plate, 75, attached to it, the harrow arranged to move horizontally forward toward the squeeze rolls and to be lifted up and carried backward above the bowl, and the agitator teeth,  
25 70, attached to a rock shaft mounted on the harrow and provided with the arm, 73, arranged to come in contact with the cam plate on the forward movement of the harrow and agitate the teeth, and to be lifted up and carried  
30 backward over the cam plate on the return movement of the harrow, substantially as described.

8. In a fiber washing machine, the combination of the bowl provided with a cam plate,  
35 75, attached to it, the harrow arranged to move horizontally forward toward the squeeze rolls and to be lifted up and carried backward above the bowl, the agitator teeth, 70, attached to a rock shaft mounted on the harrow and provided with the arm, 73, arranged  
40 to come in contact with the cam plate on the forward movement of the harrow and agitate the teeth, and to be lifted up and carried backward over the cam plate on the return movement of the harrow, and the spring,  
45 79, attached to the harrow and arranged to bear upon an arm attached to the rock shaft and press upon the latter against the action of the cam plate, substantially as described.

50 9. In a fiber washing machine, the combination of the bowl, the squeeze rolls mounted at the delivery end thereof, the trough 7 beneath the latter arranged to catch the fluid and fiber which drops from the squeeze rolls, the conduit 9 connected at one end to said  
55 trough, the reservoir 10 connected to the other end of said conduit, the bucket wheel arranged to lift the fluid and fiber from the reservoir above the edge of the bowl, and the trough 85 arranged to receive the fluid and  
60 fiber delivered by the bucket wheel, and provided with the perforated false bottom, 86, arranged to deliver the fiber and part of the fluid into the bowl above its false bottom, 3, and with the passage, 87, leading into the  
65 bowl below said false bottom substantially as described.

10. In a fiber washing machine, the combination of two pairs of levers 14, 14, mounted on pivots at their lower ends, each pair connected at their upper ends by a cross shaft across the top of the bowl, a harrow mounted upon guideways on said cross shafts and arranged to be moved up and down with the pivoted levers and to slide to and fro horizontally on said guideways, a rock shaft connected to said pivoted levers, and a weight attached to said rock shaft arranged to draw said levers upward substantially as described.

11. In a fiber washing machine, the combination of two pairs of levers 14, 14, mounted on pivots at their lower ends, each pair connected at their upper ends by a cross shaft across the top of the bowl, a harrow mounted upon guideways on said cross shafts and arranged to be moved up and down with the pivoted levers and to slide to and fro horizontally on said guideways, the rock shaft, 24, mounted upon the bowl, the chain, 29, connecting said rock shaft and pivoted levers, 80 the cam, 25, mounted on said rock shaft, and the chain 26 and weight, 27, arranged to draw the levers upward with a diminishing force as they continue to rise and carry the harrow up with them, substantially as described. 95

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Witnesses:

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