(No Model.)

3 Sheets—Sheet 1.

D. H. RICE.

WOOL WASHING MACHINE.

No. 521,818. Patented June 26, 1894.

Fig. 1.

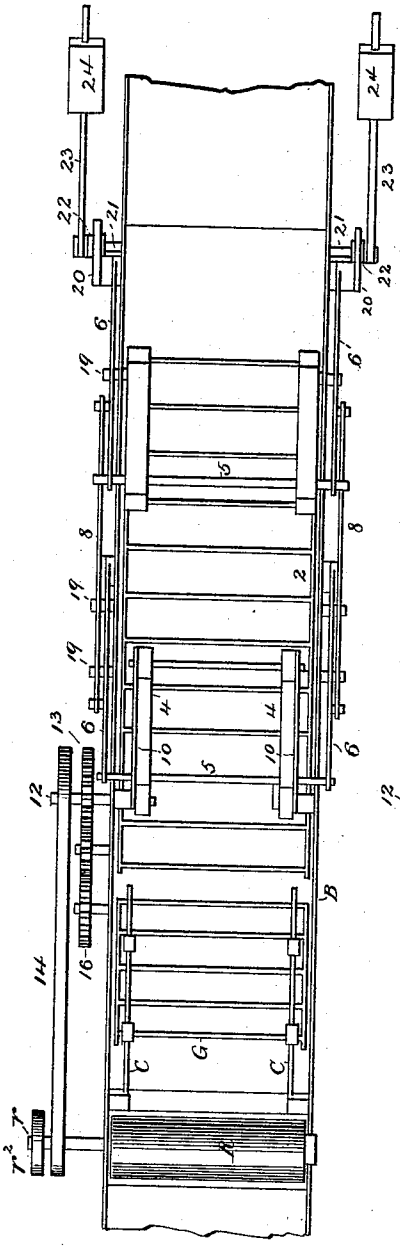
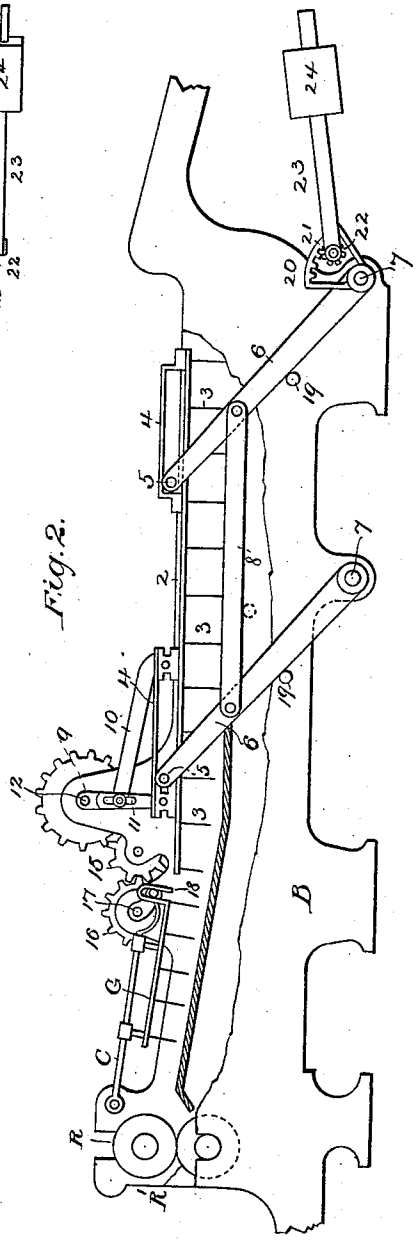


Fig. 2.



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Inventor:
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(No Model.)

3 Sheets—Sheet 2.

D. H. RICE.

WOOL WASHING MACHINE.

No. 521,818. Patented June 26, 1894.

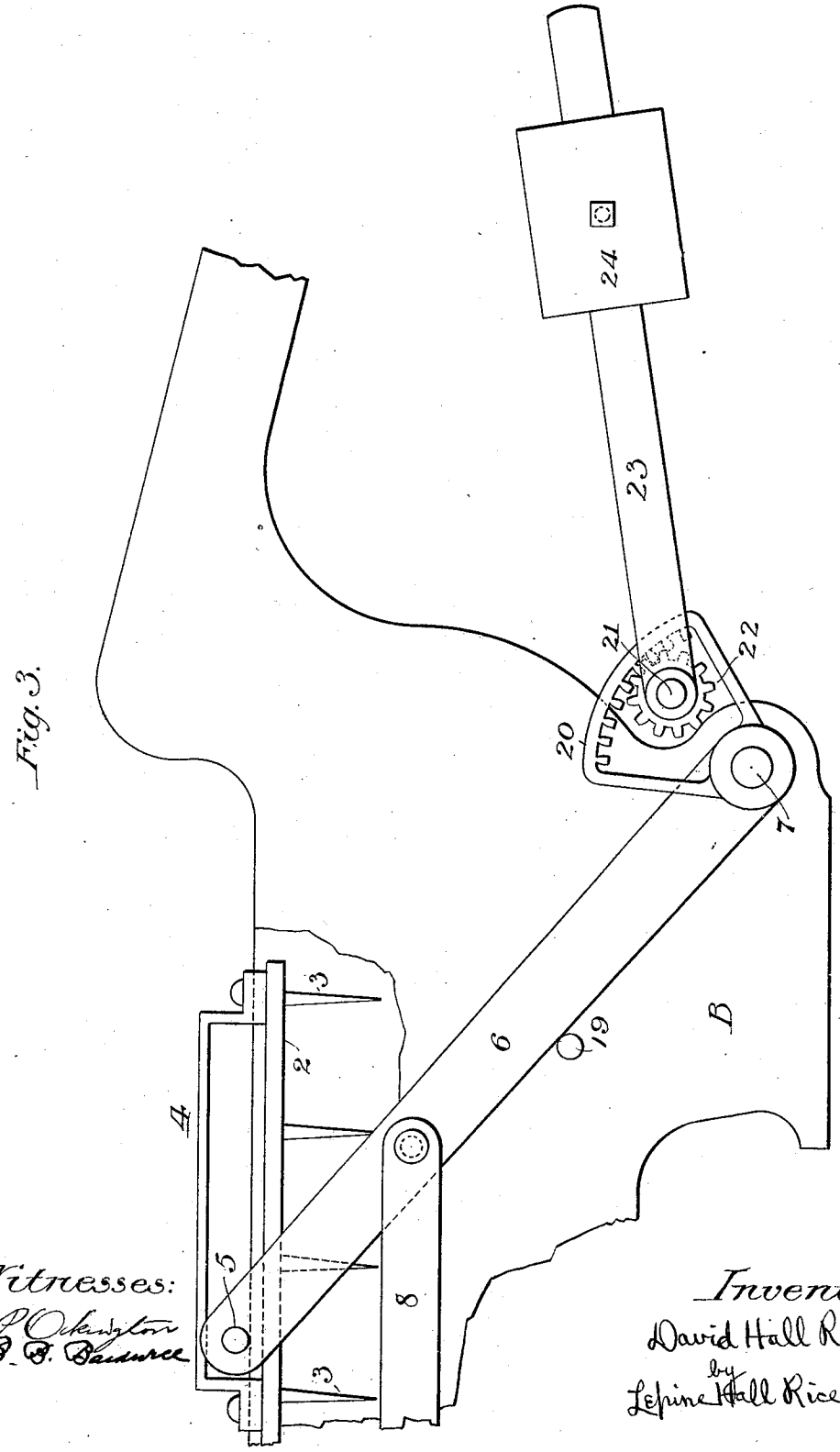

Fig. 3.

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(No Model.)

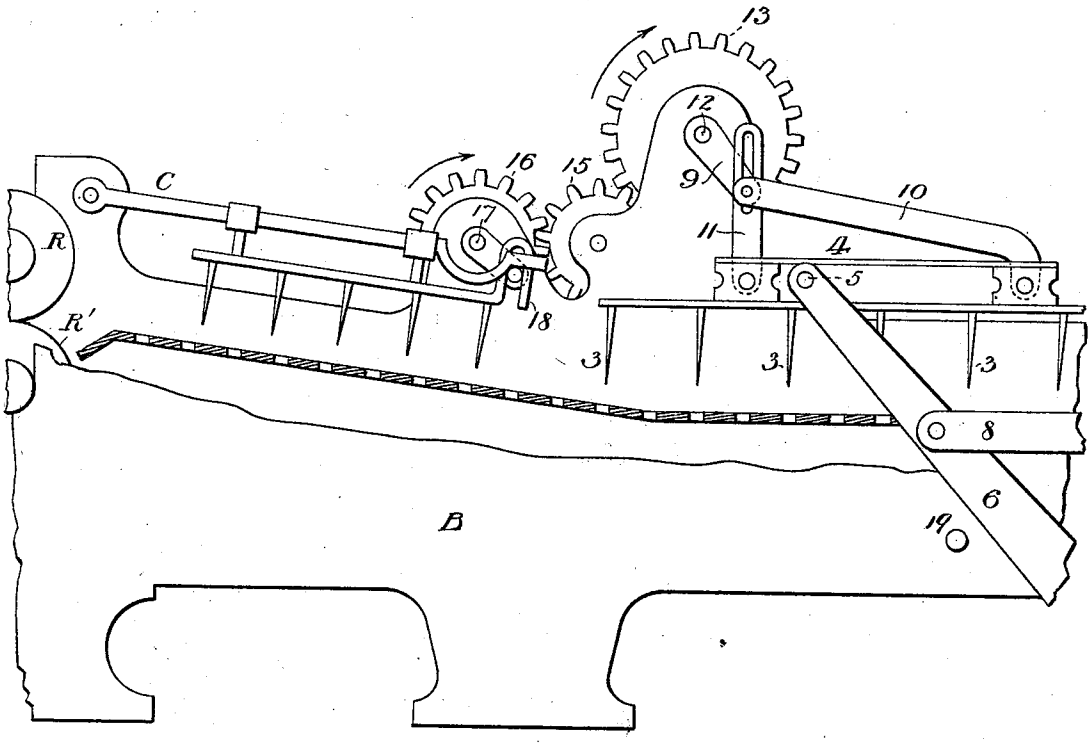
3 Sheets—Sheet 3.

D. H. RICE.

WOOL WASHING MACHINE.

No. 521,818. Patented June 26, 1894.

Fig. 4.



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UNITED STATES PATENT OFFICE.

DAVID HALL RICE, OF BROOKLINE, ASSIGNOR TO C. G. SARGENT'S SONS, OF GRANITEVILLE, MASSACHUSETTS.

WOOL-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 521,818, dated June 26, 1894.

Application filed January 5, 1893. Serial No. 457,424. (No model.)

To all whom it may concern:

Be it known that I, DAVID HALL RICE, of Brookline, in the county of Norfolk 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 wool and other fiber washing machines, and it consists in certain new and useful constructions and combinations of the several parts thereof, substantially as hereinafter described and claimed.

The improvement to which this application relates is made upon the fiber washing machine shown in the application of F. G. and A. C. Sargent, Serial No. 437,956, filed June 25, 1892, and the wool washing machine to which it is applied is constructed and operated substantially as shown and described in that application.

In the drawings: Figure 1 is a top plan view of the machine with my improvements attached thereto. Fig. 2 is a side elevation of the same, with one side partly broken away to show the working mechanism and internal construction of the bowl. Fig. 3 is an enlarged detail view of one end of the bowl as shown in Fig. 2. Fig. 4 is an enlarged detail view of the gear wheels and connected mechanism.

B is the bowl of the machine, having the false bottom, 1, which may be perforated if desired, extending through its length, above which the wool is conveyed from the feed-in end of the machine to the squeeze rolls R, R'. The harrow, 2, is intended to convey the fiber through the bowl and is composed of longitudinal and cross slats, from which the teeth, 3, project downward into the bowl, and carry the fiber along through the fluid. The harrow is supported by means of longitudinal straps, 4, 4, which are attached to the side girders of the harrow and which support it upon the cross rods, 5, 5, on which in a certain part of its movement the straps slide along. The cross rods 5 are supported at their ends by the swinging arms, 6, 6, to which they are attached, and these are pivoted on the cross rods, 7, 7, which are mounted in bearings in the sides of the bowl and pass across underneath its body part. The harrow is moved and lifted by the cranks 9, 9, which are joined at their extremities by a connecting rod, and to which is pivoted one end of the inclined links 10, 10. These links are pivoted at the other end to the harrow, and are intended to move the harrow longitudinally. Another upright link, 11, is pivoted at its lower end to the harrow and has a slot, through which the wrist pin of either crank, 9, passes as well as through the link 10. This slot is so proportioned that the crank lifts the harrow by the link, 11, as it traverses around its path.

The shaft, 12, of the crank is supported in an upright on the side of the machine and has on its outer end the gear wheel, 13, and a pulley, around which the belt, 14, passes from the shaft, r, of the upper squeeze roll where a similar pulley carries the belt. A pulley, r^2, on shaft, r, receives motion from any suitable countershaft, to which it is belted. An intermediate gear, 15, meshes into gear, 13, and drives the gear, 16, on the outer end of crank shaft, 17, the inner end of which carries the crank which moves the carrier, C, back and forth on the rods, c, by means of the slotted standard 18, through which the wrist pin of the crank extends. These various parts of the machine are substantially like those in the Sargent application referred to and their construction and operation are well understood.

In the Sargent machine above mentioned a direct counterbalance weight was attached to one of the shafts, 7, of the arm, 6, upon a lever so that the counterbalancing weight descended as the arms, 6, 6, rose when the harrow, 2, was lifted above the washing fluid and moved backward above it, to engage with fresh fiber in its forward movement and advance it through the bowl. The disadvantage of this arrangement was that it required a very heavy weight which in its descent pulled more and more upon the arms 6, 6, as they rose up. But as these arms rose with the harrow to the highest point of its movement they required less weight to counterbalance the harrow than when the harrow was at its lowest point because as it rose up the bars, 5, 5, came nearer above the rock shafts 7, 7, of the arms 6, 6, and required considerable

less weight when in this position to counterbalance the harrow than when at their lowest point as shown in Fig. 2. My arrangement is designed to overcome this difficulty. On one of the rock shafts, 7, I attach two toothed sectors, 20, 20, which extend upward and outward from the rock shaft. Under the feed-in end of the bowl I mount another rock shaft, 21, and on this I attach the pinions, 22, 22, in position to engage with the toothed sectors, 20. On each end of rock shafts, 21, I attach a lever, 23, and on each lever I mount the weight, 24. As the pinions, 22, are much smaller than the geared sectors they will require that the weights, 24, shall move downward underneath their rock shafts, 21, to a much greater distance than if the weights were mounted directly upon the rock shafts, 7, and as the weights move downward under their rock shaft 21, they diminish their pull upon said shaft, and its pinions, 22, in proportion to the less weight required to counterbalance the harrow by the upward movement of the arms, 6, 6, thus requiring a proportionately less amount of power to be applied to the crank, 9, to force the harrow down into the fluid and move it forward through the bowl. The weights 24 can also be made smaller than if they were directly applied to rock shafts, 7. With the machine as shown, the weights would require a place cut through the floor on which it stands, to allow them to swing downward to the full extent of their movement, but by shortening the levers, 23, and placing the weights, 24, closer to their rock shaft, 21, and properly proportioning them they may be made to swing downward through their entire path above the floor on which the machine stands, and by enlarging the arc of the geared sectors, 20, and placing the rock shaft, 21, higher up from the floor the amount of movement given to the weights may be increased to any desired extent in proportion to the movement of the swinging arms, 6, thus more rapidly dimishing the pull of the weights, 24, in counterbalancing the harrow if desired. The arms, 6, 6, are arrested by stops, 19, 19, in the sides of the bowl, when they have reached their extreme downward movement, and they are attached together on each side by the link, 8, pivoted to them at each end so that they are forced to move simultaneously up and down and support the harrow equally at each end by the action of the counterbalancing weights, 24.

It is evident that instead of using two sectors, 20, and two pinions, 22, upon the rock shaft, 21, a single sector and a single pinion may be made to do the same work and that the substance of the invention will be fully accomplished by their use, provided they be made strong enough to endure the strain of counterbalancing the harrow, and this may be accomplished by leaving off one sector and one pinion from the machine without other material change.

What I claim as new and of my invention is—

1. The combination in a fiber washing machine, of the harrow arranged to move forward through the bowl and up and down to convey the fiber forward, the swinging arms, 6, 6, arranged to move up and down on rock shafts at their lower ends and support the harrow, a sector, 20, attached to one of the rock shafts of the arms, 6, a shaft, 21 and pinion, 22, engaging with sector 20, and a weighted lever, 23, attached to the rock shaft, 21, and arranged to swing downward and diminish its pull upon its rock shaft in proportion as the arms, 6, 6, rise with the harrow, substantially as described.

2. The combination, in a fiber washing machine, of the harrow arranged to move forward through the bowl and up and down to convey the fiber forward, the swinging arms, 6, 6, arranged to move up and down on rock shafts at their lower ends and support the harrow, an internally geared sector, 20, attached to one of the rock shafts of the arms, 6, a shaft, 21, and pinion, 22, engaging with the sector, 20, and a weighted lever, 23, attached to the rock shaft, 21, and arranged to swing downward and diminish its pull upon its rock shaft in proportion as the arms, 6, 6, rise with the harrow, substantially as described.

DAVID HALL RICE.

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N. P. OCKINGTON.