

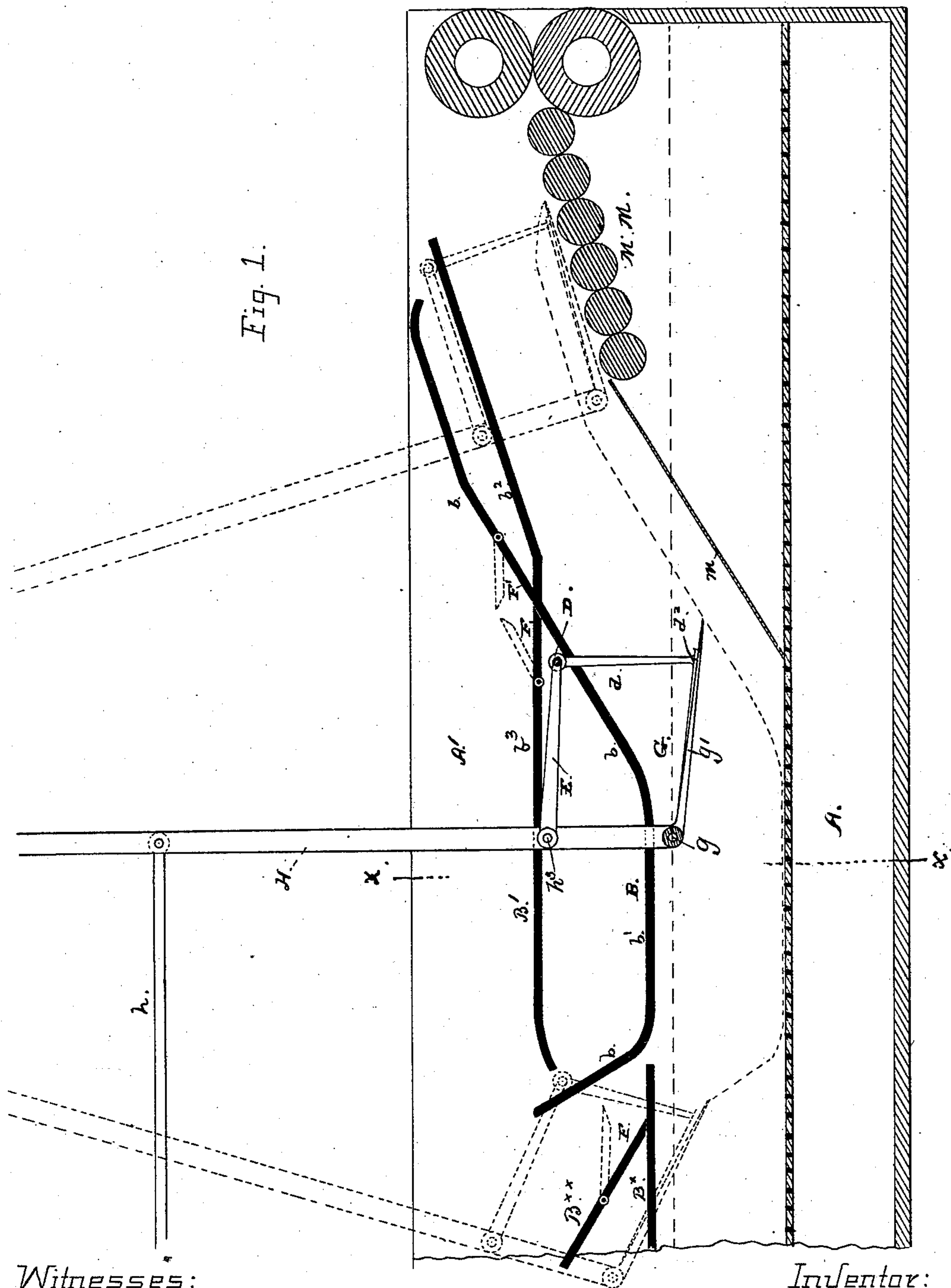
(No Model.)

3 Sheets—Sheet 1.

H. C. WALKER.  
WOOL WASHING MACHINE.

No. 304,767.

Patented Sept. 9, 1884.



Witnesses:

Geo. A. Dickson  
E. Patten

Inventor:

Harry C. Walker

By his Atty., - - Edward J. O'Connell

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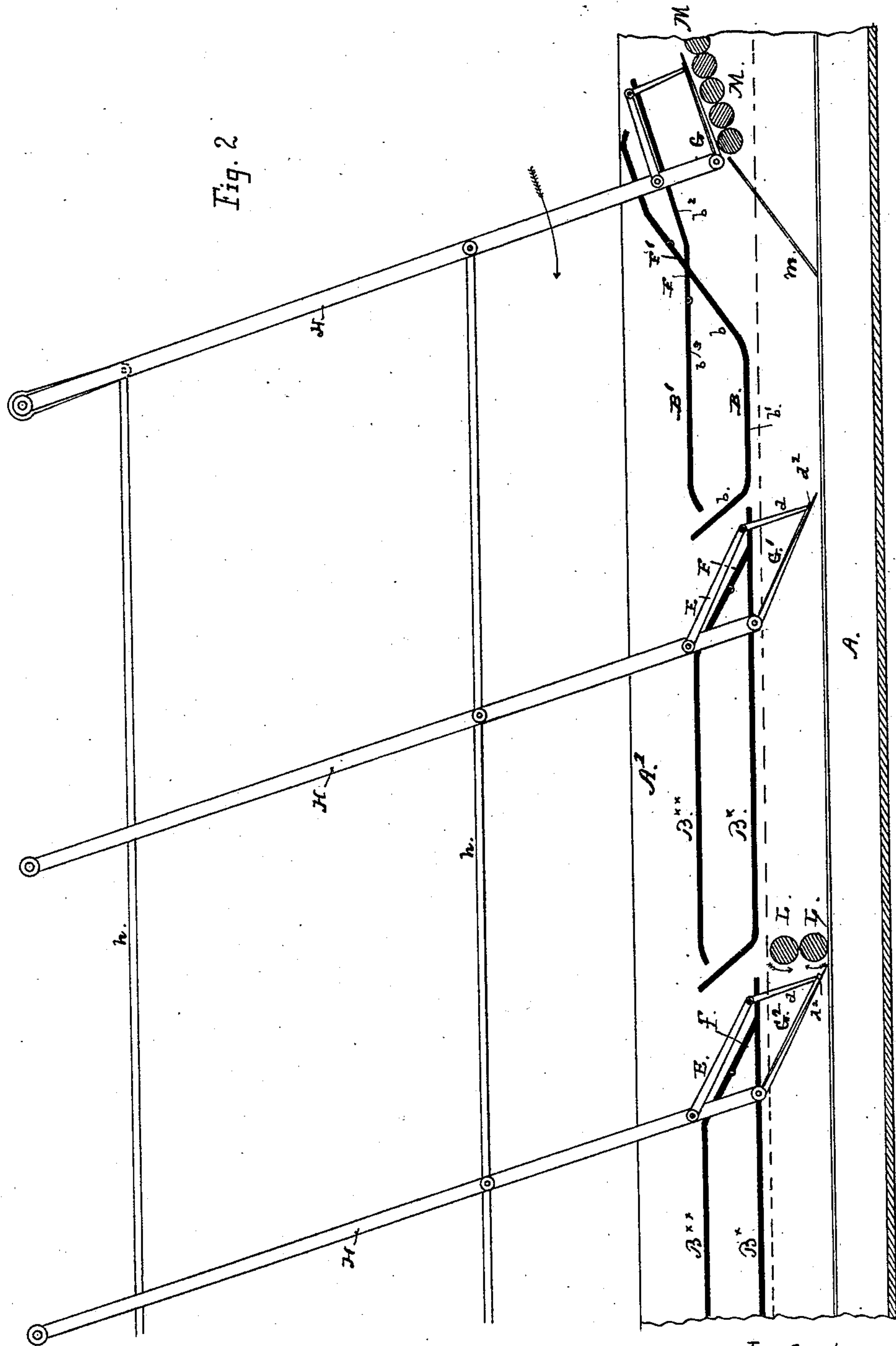
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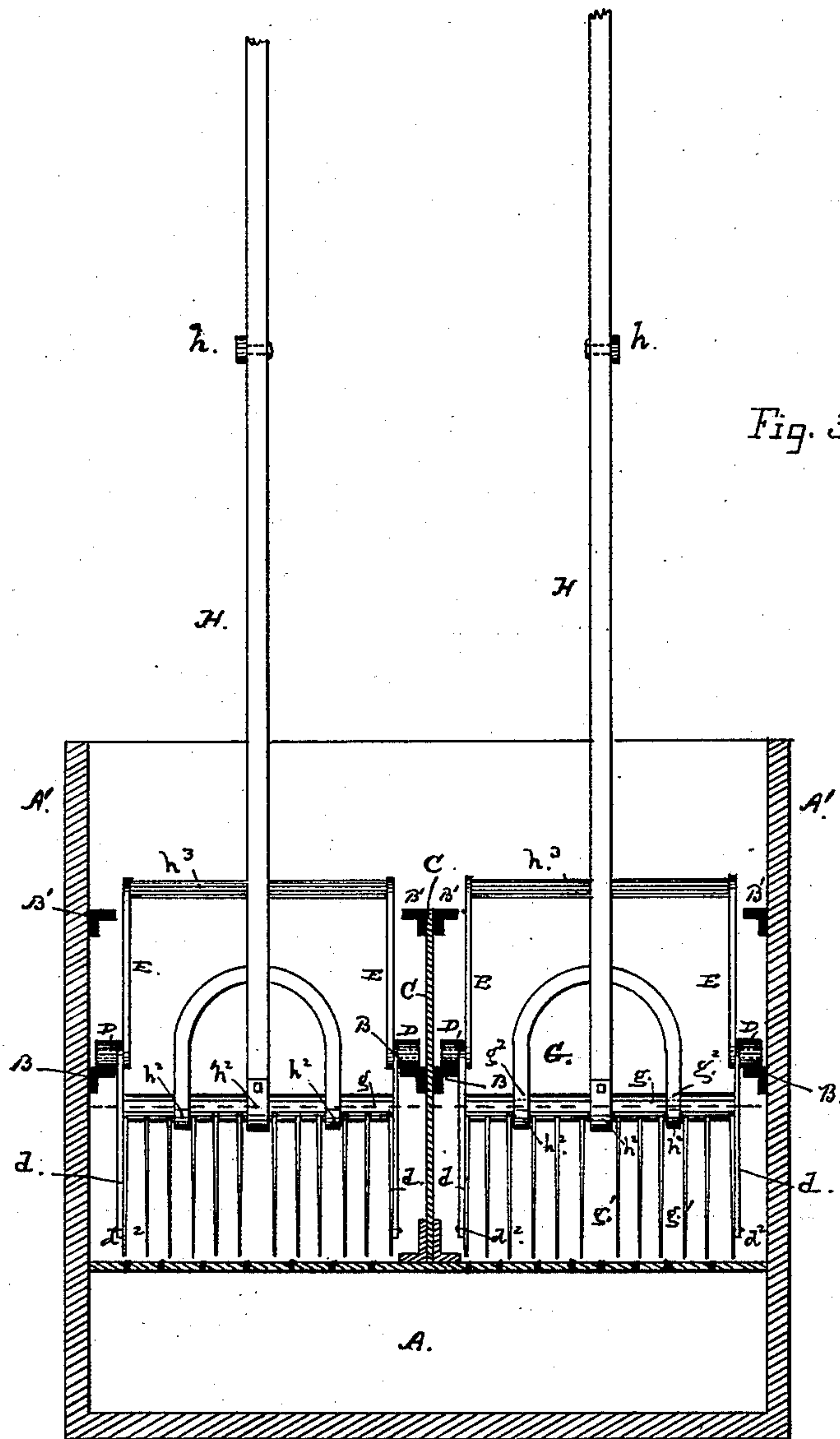
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# UNITED STATES PATENT OFFICE.

HENRY C. WALKER, OF SAN FRANCISCO, CALIFORNIA.

## WOOL-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 304,767, dated September 9, 1884.

Application filed May 16, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY C. WALKER, a citizen of the United States, residing in the city and county of San Francisco, State of California, have made and invented certain new and useful Improvements in Wool-Washing Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to certain novel construction and combination of parts and mechanism to produce a simple and effective machine or apparatus for washing wool.

The following description fully explains the nature of my said invention and the manner in which I proceed to construct, apply, and use the same.

In the accompanying drawings, Figure 1 is a side elevation, in longitudinal section, of the upper or discharge end of a tank having my improved fork and operating mechanism combined with it. Fig. 2 is a similar section, on a smaller scale, showing the manner of connecting and operating a series of forks in a tank. In this view are shown the squeezing-rollers. Fig. 3 is a cross-section taken vertically through the machine at about the line *x x*, Fig. 1.

A may represent a suitable tank having a perforated bottom or surface to support the wool above the dirt and sediment collecting in the lower part of the tank.

B B' are fixed guides or tracks fixed along the sides of the tank from end to end, and of such form and so arranged with relation to a fork-head having an oscillating or reciprocating motion longitudinally through the tank that they act to control the movements of the fork and cause it to take a series of novel positions in the general reciprocation. These peculiar movements are produced by the engagement, with the fixed guides, of studs or rollers on the sides of the fork-head, and they are constructed and operate as follows: First a depression of the front end of the fork and a forward sweep in this position, with the depressed ends of the tines following closely the surface of the perforated bottom; then an elevation of the front ends of the tines, to bring

the fork up horizontally, and an upward course through the liquid at the same time with the general travel or sweep, so that the fork rises to the surface of the liquid in a position horizontal or nearly so; and then an elevation of the front end, to bring the fork over a discharging traveling apron or gang of rollers; and, finally, a downward movement as the general forward travel or sweep is completed to bring the bottom of the tines directly upon the inclined discharging-surface. In the return movement to the point of beginning, the fork is first drawn back in a line substantially parallel with the inclined discharging-surface, (apron or roller,) and when clear of it the ends of the tines are raised and the fork is caused to take and hold such position that for the remainder of the general backward sweep it passes over just clear of the surface of the liquid. The fixed guides B B', producing these several movements and changes of position, are composed of a combination of horizontal and inclined tracks projecting sufficiently from the vertical sides of the tank to present surfaces for studs, projections, or rollers D on the fork-head to run on. Two sets or series of guides are employed on each side of the tank, one to control the fork in the forward sweep and the other to regulate the position in the backward movement. The former set are marked B B, and the latter B\* B\*\*. These guides being placed at and along each side of the tank, both sides of the fork are equally supported. The sides A' of the tank are carried upward to a sufficient height above the working-level of the washing-liquid to support the guides clear of its surface. The relative position and length of these fixed guides of course depend upon the depth and length of the tank, and to a certain extent the width of the tank is limited by the width of fork. The fork will keep an even and level position under ordinary conditions of load. It is therefore a better construction to use two or more narrow forks, instead of a single wide one. They will be arranged side by side, and should be connected to work alternately, or one in advance of the other. The strain upon the operating mechanism will then be less than if the forks were worked abreast. The guides for their inner sides are upon a



vertical partition, *c*, extending longitudinally through the center of the tank. In like manner any desired number of forks can be coupled together in line to operate across a tank of any given width. The construction is then substantially as follows: The guides B B' are strips of wood or metal secured against the inner sides of the tank to form tracks or ways for rollers D, that are secured to the ends of projecting arms EE on the fork. The guide B has inclined outer end portions, *b*, and an intermediate horizontal section, *b'*. Guide B controls the position of the fork during the forward sweep and delivers it onto the upper end of the guide B', that acts upon the fork on the back-stroke. This second guide is composed of an inclined and a horizontal portion, *b<sup>2</sup> b<sup>3</sup>*, and the end of the horizontal part delivers the fork in turn to the upper end of the first guide, B, again. Where the two guides cross each other a portion of the uppermost guide at the point of intersection is hinged or otherwise made to turn up when struck by the stud of the fork-frame running on the guide below, but to hold in line with its track when the stud is passing over it. These sections are seen in Figs. 1 and 2, F being the section in the second guide, B', that is raised to let the fork pass up the incline on the first track, and F' the section in the first guide that rises to allow the fork to pass along the second track, B'. The fork G is attached to the end of an upright swinging bar, H, supported from a center of oscillation over the tank, and driven by any suitable means, such as a crank or an eccentric on a motor shaft and a connecting-rod, *h*. A series of these forks may be coupled together. As shown in Fig. 2, three forks, G, G', G<sup>2</sup>, are mounted and connected so as to work together, being pivoted at the top and to the lower rod, *h*, so as to be worked together. The length of the tank and the number of forks and guides determine the length of stroke, and the entire number being coupled together, they may all be worked from the same shaft. The rear forks, however, have simpler movements than the head-fork, as their office is simply to move and progress the mass of wool regularly forward through the tank, while the head-fork performs the work of lifting the matter and depositing it upon the discharging-apron. The fixed guides B\* B\*\* are somewhat differently formed and combined together, and but one hinged section, F, is required. They are formed simply of an inclined and a horizontal section, the upper guide being the reverse of the lower one. Their action upon the fork is to keep the front end of the tines depressed toward the tank-bottom in the forward stroke, and to raise and hold it up horizontal, or nearly so, on the back-stroke. The construction of one fork is followed in all the others. It consists of a head, *g*, composed of a cylindrical rod having tines *g'* *g'* set into it, and the grooves or portions *g<sup>2</sup>* of reduced diameter that fit into bearings on the end of the swing-

ing rod H and the ends of a curved brace, *h'*. Straps *h<sup>2</sup>* are used to hold the head in place. Upon the rod H, at a point above the head, is fixed a cross-arm, *h<sup>3</sup>*, of the same length as the head *g*, and to each outer end of this arm is attached a rocking lever, E. The free end of this lever has a stud carrying a roller, D. From the outer end of this lever, also, a connecting-rod, *d*, is carried down to the outside tines at each side of the fork, where it is attached by a pin or stud to give a hinged joint, *d<sup>2</sup>*. The width between the rollers D D on the outer end of the levers is equal to the distance from the guides on one side to the corresponding one on the other side of the track, and thus the front end of the fork is suspended from and carried by the arm, and the surface of the forks then follows and is determined by the form of the guides B B'. The lower end of the swinging rod H, with the cross-head *h<sup>3</sup>*, and levers E, with the connecting-rods *d*, constitute a fork-frame, by which the fork is held and operated. The rollers D may be included in this frame, as they provide the means for guiding the fork. The head-fork, in its forward sweep, is depressed at the front, to pass under the wool on the bottom of the tank, and then becoming loaded, the points of the tines are raised so that the fork is brought up to a horizontal position, and while holding this position it passes out of the liquid nearly level with the surface. The rear forks have the same inclined position at the forward stroke, but on the return they are drawn upward and backward before being turned up to the horizontal, so that they draw out from beneath the wool and leave it in position to be seized by the next fork in advance. This is illustrated in Fig. 2 of the drawings. I place a set of squeezing-rollers within a washing-tank in position to act upon the matter while it is being moved through the liquid. I place rollers L L below the surface of the liquid, and drive them by means of gears on the outside. Their position is across the tank just at a point where the wool that is being discharged from a fork will be brought up against them as the forward sweep of the fork terminates. They are rotated in a direction toward each other, and one or the other is mounted in adjustable bearings, so that any required amount of pressure can be obtained upon the wool passing between them. The inclined discharging-surface can be an endless traveling-apron, or a set of rollers driven by belts or gears in the same direction, and having a uniform speed, as at M M.

To prevent the wool from passing beyond the lower end of the apron and out of range of the fork, I fix an inclined plate, *m*, in the space between the tank bottom and the lower roller, from side to side.

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

1. In an apparatus for washing wool and



for analogous purposes, a pivoted fork and frame consisting of the swinging rod H, reaching down to the lower rear corner of the fork, a head, *g*, pivoted at the base of the rod H, and having tines *g'*, a cross-head, *h*<sup>3</sup>, secured in the rod H at a point above the head *g*, rocking levers E, pivoted to the part *h*<sup>3</sup>, and connecting-rods *d*, pivoted at one end to the levers E and at the other to the outside teeth near the front, the points where the levers E and rods *d* are connected being provided with the rollers D, as set forth.

2. The combination, with a suitable tank and fixed guides B B' and B\* B\*\*, of the set or series of forks G G' G<sup>2</sup>, and swinging rods H, and connecting-rods *h*, substantially as set forth.

3. The combination of the tank, fixed guides having hinged or lifting sections F F', reciprocating fork G, fork-head frame H *h*<sup>3</sup> E *d* D, inclined discharging-surface M, and plate *m*, all constructed and arranged substantially as herein set forth.

4. In a wool-washing machine, the combination of the reciprocating forks with the in-

tersecting fixed guides or tracks B B', having the hinged or lifting sections F F', substantially as described.

5. In a wool-washing machine, the combination, with the reciprocating forks, of fixed guides or tracks B\* B\*\*, and the hinged or lifting end portions F on the upper guide B\*, substantially as described.

6. The combination, with a suitable tank, of a set of reciprocating forks, and intersecting guideways secured to the tank and curved substantially as described, upon which the forks ride, and hinged sections in said guideways at the point of intersection thereof, by means of which the forks are held with their points down to the bottom of the tank at the beginning of the forward movement, then elevated at the end of the forward movement, dropped upon the rubbing-rolls, and then drawn backward at a considerable distance above the bottom of the vessel.

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Witnesses:

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EDWARD E. OSBORN.