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PATENTED FEB. 4, 1908.

D. A. SAWYERS.
WASHING MACHINE.

APPLICATION FILED AUG. 20, 1907.

2 SHEETS—SHEET 1.

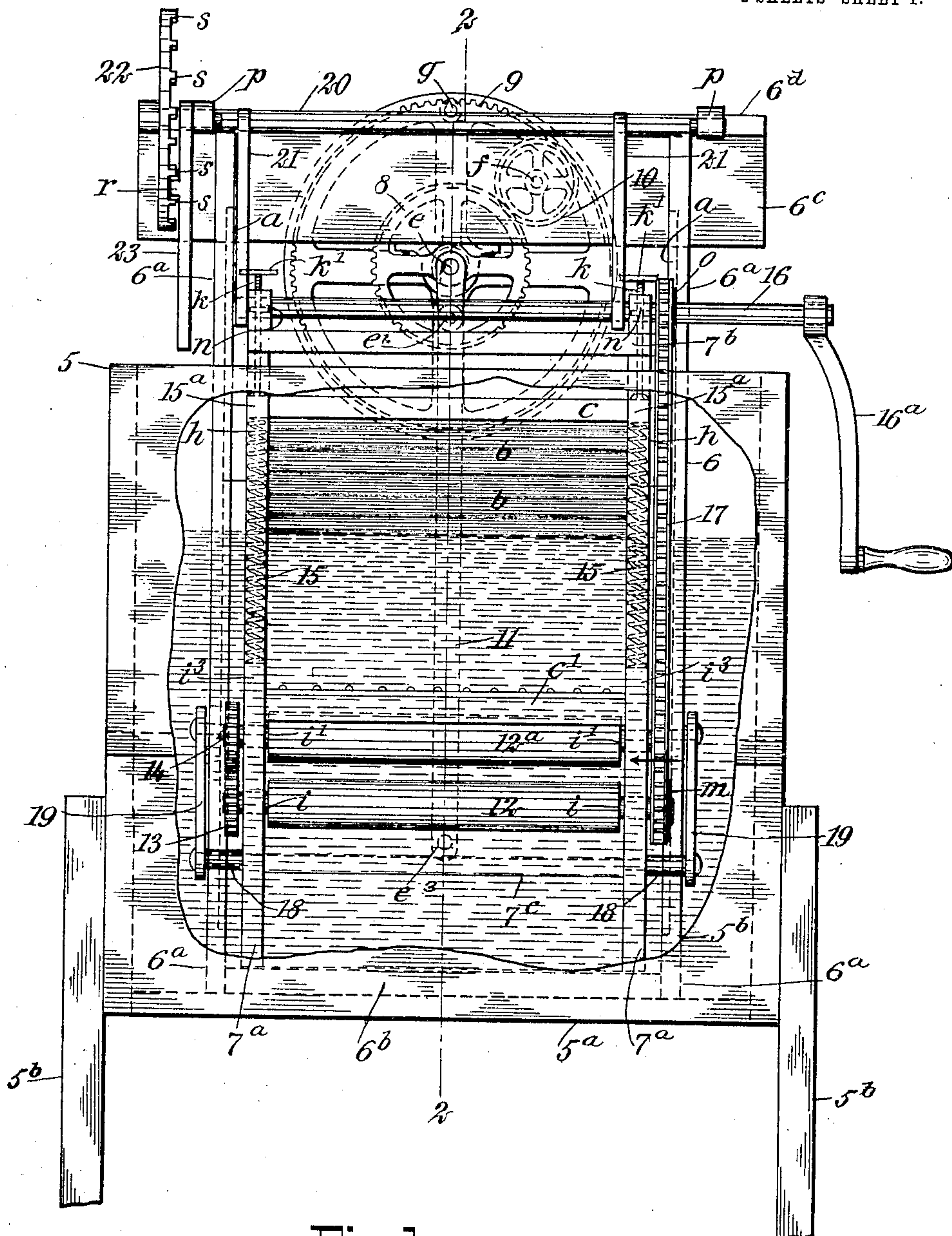


Fig. 1.

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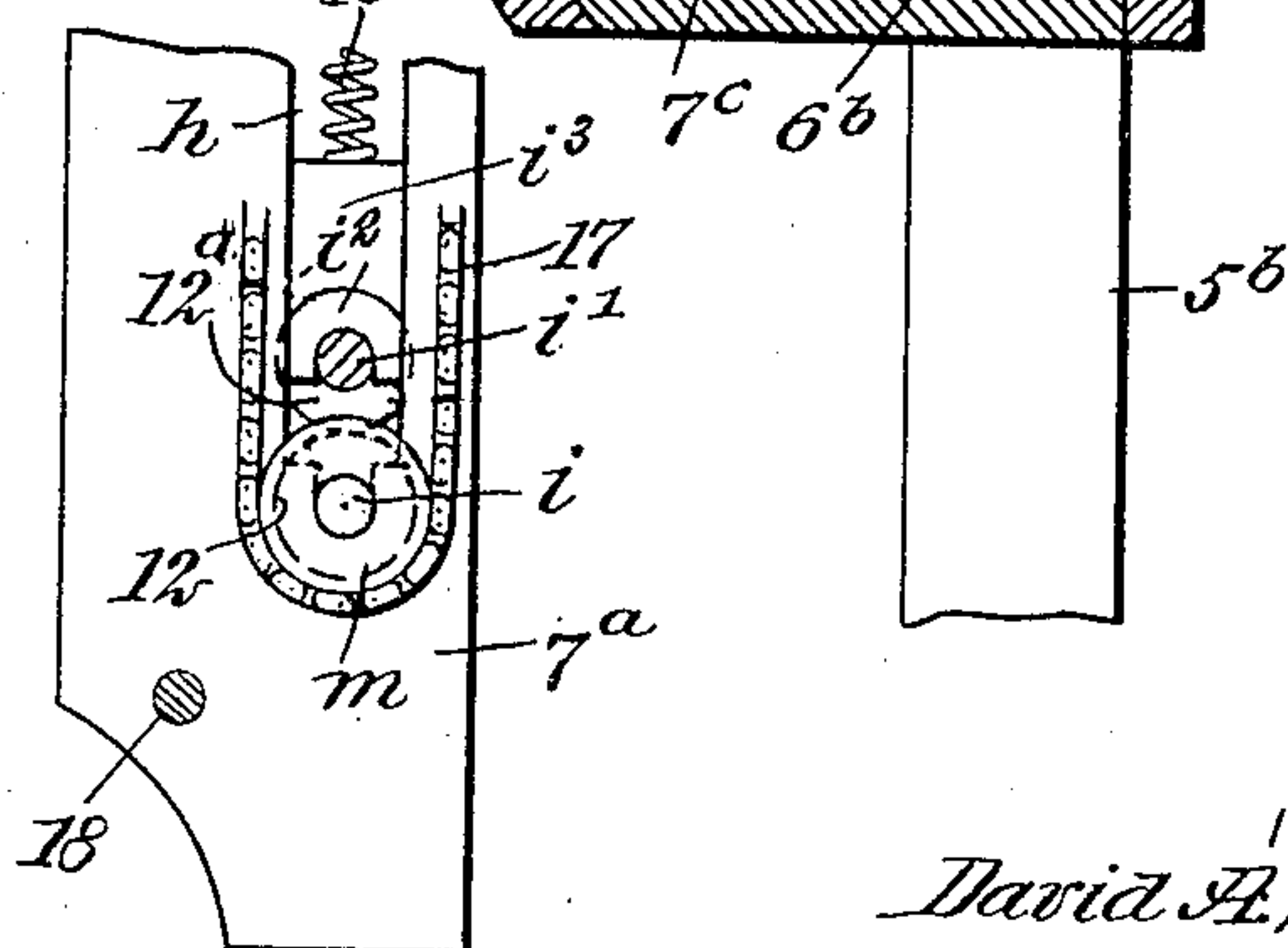
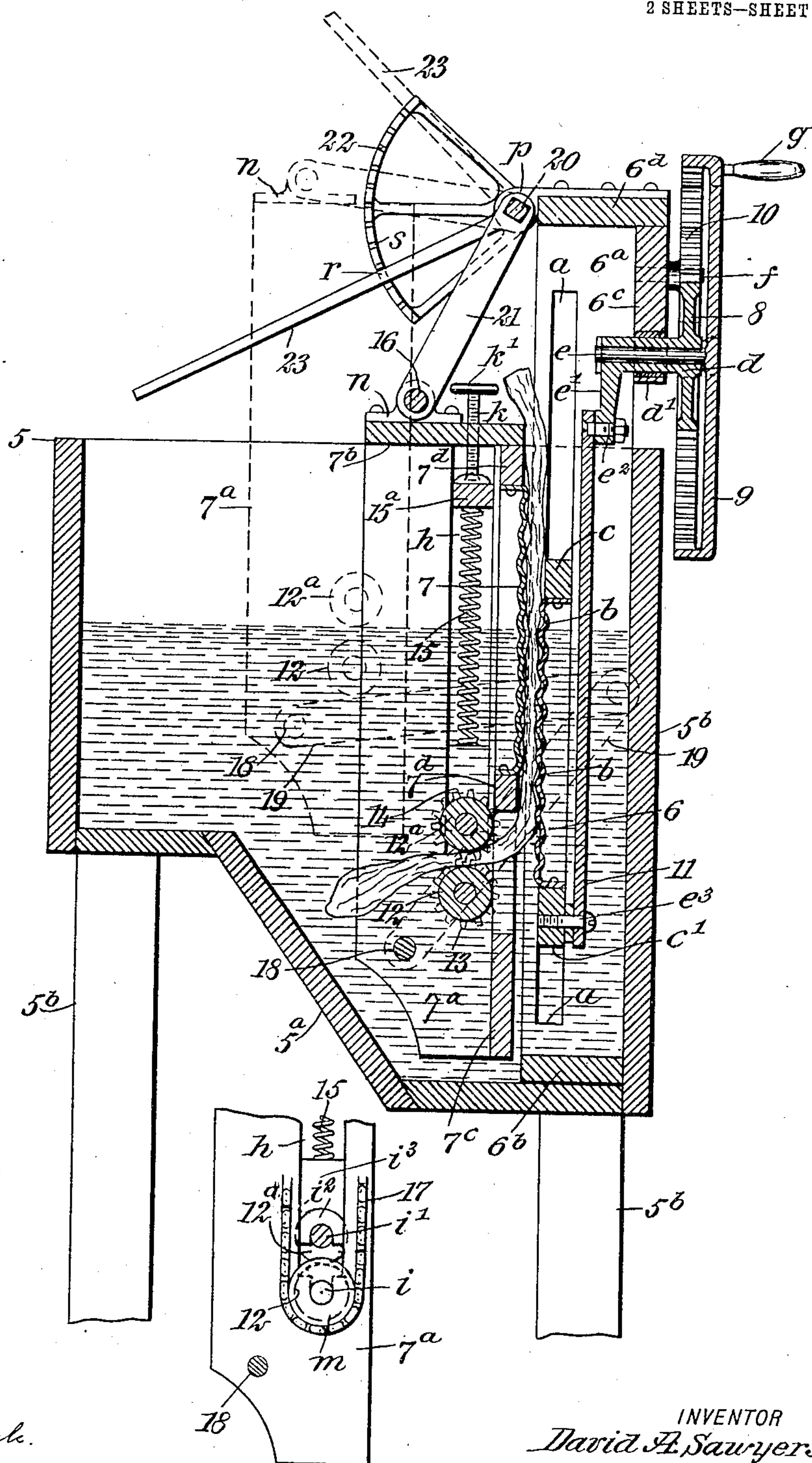
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UNITED STATES PATENT OFFICE.

DAVID A. SAWYERS, OF UNIONVILLE, IOWA.

WASHING-MACHINE.

No. 878,427.

Specification of Letters Patent.

Patented Feb. 4, 1908.

Application filed August 20, 1907. Serial No. 389,385.

To all whom it may concern:

Be it known that I, DAVID A. SAWYERS, a citizen of the United States, and a resident of Unionville, in the county of Appanoose and State of Iowa, have invented a new and Improved Washing-Machine, of which the following is a full, clear, and exact description.

This invention relates to washing machines of the reciprocating rubber type, and the purpose of the invention is to provide novel features for a washing machine of the type indicated, which are simple, practical and co-acting, and enable working parts to be brought into rubbing contact with both sides of fabric, successively at different points thereon, so that the entire piece of material operated upon, may be quickly and thoroughly renovated by the operation of the machine thereon.

The invention consists in the novel construction and combination of parts, as is hereinafter described and defined in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures, and in which

Figure 1 is a front elevation of the machine, having the front wall broken away for exposure of working parts; Fig. 2 is a longitudinal sectional view, substantially on the line 2—2 in Fig. 1; and Fig. 3 is a partly sectional side view, showing the lower portion of one side of a rubber frame, and boxes for journal ends of rollers employed, seen in direction of the arrow at the lower right hand portion of Fig. 1.

A preferably four-sided suds box 5 is provided that is closed by a bottom wall 5^a at its lower end, but may be mainly uncovered at the upper end thereof, said box being mounted upon four legs 5^b. Two rubber frames are employed for support of two transversely ribbed rubber boards 6 and 7; said boards may be of wood or non-oxidizing metal plates. The supporting frame for the rubber board 6 is formed of two side pieces 6^a of a height that will permit their upper ends to project somewhat above the upper edge of the suds box 5. The side pieces 6^a are spaced apart by a bottom piece 6^b and a top piece 6^c that is secured upon the front edges of the side pieces, and also by a cap piece 6^d, the latter being secured upon the upper ends of the side pieces. The lengths

of the transverse pieces 6^b, 6^c and 6^d are equal, and when secured at their ends upon the side pieces 6^a, produce a rectangular frame, that when in place stands erect in the suds box, having the front vertical edges of the side pieces 6^a in contact with the front wall 5^b of the suds box, and the top cross piece 6^c disposed in the same vertical plane with said front wall as shown in Fig. 2, said frame entire being removably secured in place by any suitable means.

In the corresponding and nearest sides of the pieces 6^a, a longitudinal channel *a* is formed in each one; these similar channels are disposed opposite each other and extend nearly the length of the side pieces they are formed in. The part 6 that is technically termed a rubber board, is rectangular edge-wise, has sufficient area for effective service, and may be formed of wood, metal or other available material. If the rubber board 6 is formed of plate metal, its side surfaces should be coated with a non-oxidizing metal, either by galvanizing or other means, and said plate is formed with its sides corrugated transversely, thereby producing a series of ribs *b* thereon. The upper and lower edges of the rubber board 6 are respectively secured upon two cross bars *c*, *c'*, and at their ends the latter have a loose engagement with the frame side pieces 6^a in the vertical channels *a*, free to receive vertical reciprocating motion along with the rubber board.

The preferred means for actuating the rubber board 6 comprises the following details: A spur gear 8 is formed with a tube cylindrical hub *d* that projects centrally from one side thereof, and is rotatably engaged with the bore of a box *d'*, secured transversely in or on the top cross piece 6^c of the rubber frame. In the central bore of the hub *d* a cylindrical shaft *e* is loosely inserted, said shaft having one end thereof secured centrally in or on a large crown gear 9, this gear having its teeth arranged opposite the spur gear 8 that is concentric therewith. A spur gear 10 is journaled on a stud *f* that projects outward from the top frame piece 6^c parallel with the shaft *e*, and as shown by dotted lines in Fig. 1, the gear 10 meshes with the spur gear 8 and the crown gear 9. Upon the end portion of the shaft *e*, which projects within the plane of the front wall 5^b, a crank arm *e'* is secured by one end, the other end thereof being pivoted at *e*² upon the upper end of a connecting rod 11, which projects

downward, and near its lower end is lapped upon and pivoted to the lower cross bar c' , as at e^3 , the length of the connecting rod being so proportioned, that when the crank arm is downwardly disposed the cross bar c' will be at the lowest point of its sliding movement, as shown in Fig. 2. A crank handle g projects from the outer side of the crown gear 9 near the periphery, and it will be seen that the rotation of the train of gears 8, 9 and 10 by manipulation of said handle, will reciprocate the rubber board 6 in a vertical plane.

Another frame for the support of the rubber board 7 is employed, this mainly rectangular frame consisting of two similar side pieces 7^a held parallel with each other by the top cross piece 7^b secured horizontally on the upper ends of the side pieces, and the lower cross piece 7^c that at its ends is affixed upon the vertical side edges of the pieces 7^a which are adjacent the side pieces 6^a on the other rubber supporting frame. The rubber board 7 is similar in construction to the rubber board 6 and may be of wood or metal. Upon the upper and lower transverse edges of the rubber board 7, two cross bars 7^b are secured, and said cross bars at their ends are secured upon the edges of the side pieces 7^a that are engaged with the cross piece 7^b at a proper distance above the latter. In the side pieces 7^a are two similar longitudinal slots h , formed oppositely, said slots extending respectively in the side pieces from opposite points therein near lower ends of the same. Seated rotatably in boxes formed or inserted in the slots h at their lower ends, are the journal ends i on a cylindrical roller 12, and similar journal ends i' on a mating roller 12^a are rotatably carried in half boxes i^2 formed on lower ends of two similar slide blocks i^3 which are adjustably held in the slots h , one block being shown that will suffice for illustration of both in Fig. 3. The journal ends i , i' at corresponding ends of the rollers 12, 12^a are extended outward, and on said ends are secured two small gears 13, 14, which mesh with each other. In the slots h above the slide blocks i^3 , two similar spiral springs 15, 15 are placed, having their lower ends seated thereupon and at their upper ends carrying a presser bar 15^a , the ends of which are loosely inserted in the slots h . In the top cross piece 7^b or in nuts therein, two adjusting screws k are inserted, which at their lower ends are loosely secured upon the presser bar 15^a and upon the upper ends of said screws hand wheels k' are secured. It will be seen that the adjusting screws k are respectively positioned above end portions of the presser bar 15^a , and by their equal adjustment longitudinally there may be equal pressure put upon each spring 15, that in turn depresses the journal ends of the upper roller 12^a .

From the lower roller 12 at its end opposite

from the one carrying the gear 13, the journal end i is outwardly extended, and thereupon is secured a sprocket gear m . Journal boxes n are mounted upon the top cross piece 7^b , respectively near each end thereof, said boxes affording bearings for a horizontal shaft 16, that as shown in Fig. 1 projects outward at one end beyond the suds box 5. Upon the shaft 16, directly above the sprocket gear m , a similar sprocket gear o is secured, and the gears m , o are connected with a sprocket chain 17, as indicated in Fig. 1, the gear m being plainly shown along with the lower portion of the chain in Fig. 3. A crank handle 16^a is secured upon the extended end of the shaft 16, and obviously the turning of said handle 16^a will through the sprocket gears m , o , chain 17, and spur gears 13, 14, rotate the rollers 12, 12^a in either direction correspondingly.

A horizontal shaft 18 is journaled near its ends in the frame side pieces 7^a , near their lower ends, and upon the laterally extended ends of said shaft, the lower ends of two similar link plates 19 are loosely mounted and secured from displacement. The remaining ends of the link plates 19 are extended at an incline upward and forward, lapping upon respective side pieces 6^a of the stationary frame whereon the rubber board 6 is adapted to reciprocate. The end portions of the link plates 19, which have contact with the side pieces 6^a , are pivoted thereon as indicated in Figs. 1 and 2. A rock shaft 20 is journaled in spaced boxes p that are secured on the cap piece 6^d , and near said boxes, two link plates 21 are loosely mounted upon the rock shaft by insertion of the latter through lateral perforations in the upper end portions of said link plates. Near their lower ends in similar perforations, the link plates 21 receive the body of the horizontal shaft 16. A toothed sector plate 22 is secured upon the cap piece 6^d near one end of the rock shaft 20, and adjacent to the sector plate an adjusting lever 23 is secured by one end upon the rock shaft, the lever having a toe r thereon, which may be interlocked between any two teeth s on the sector plate.

It will be noted, as shown by dotted lines in Fig. 2, that by a rocking adjustment of the lever 23, the frame whereon the rubber board 7 is carried may be removed a distance from the other rubber board 6, and thus afford free access to the space between said rubber boards.

In operation, after hot suds water has been placed in the suds box 5 and garments or other fabric have been thoroughly soaked in the suds water, such pieces of fabric are best cleansed by conducting the rubbing action on each one separately. To this end the piece to be first operated upon is inserted down between the rubber boards 6, 7, when the latter have been rocked away from the

board 6; the rubber board 7 is now moved toward the rubber board 6, so as to have contact with the fabric. The rollers 12, 12^a that have been previously adjusted at a proper distance from each other, are now given a rotatable movement in the direction which will pull the fabric down between the rubber boards, leaving a sufficient portion therebetween for their rubbing action upon the same. The handle *g* on the crown gear 9 is now turned preferably to the right, which will reciprocate the rubber board 6, and any desired degree of pressure may be given to the rubber board 7 upon the fabric that is between the boards 6, 7, by a proper rocking movement of the lever 23.

It will be seen that a proper adjustment of the spring pressed slide blocks *i*³ will cause the upper roller 12^a to bear with suitable pressure on the other roller 12 and clamp the fabric between said rollers, so that the rubbing operation will not displace the fabric. When one portion of the fabric has been completely renovated by means of the rubbing and squeezing effected by the rubber boards 6, 7, this cleansed portion of the fabric may be passed above the rubber boards by turning the rollers 12, 12^a in a proper direction due to manipulation of the crank handle 16^a. This will place another portion of the fabric between the rubber boards 6, 7, and the rubbing operation for cleansing said fabric may be repeated.

Obviously, the rubbing action of the board 6 may be continued in engagement with different parts of fabric that may have considerable length, and every portion of the same be thoroughly cleansed on the side that has been operated upon. If necessary, the goods after having been effectually rubbed upon one side, may be turned over and the

side that had been in contact with the rubber board 7 be brought into contact with the rubber board 6, which will permit both sides of the fabric to be rubbed for its thorough renovation.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. The combination with a suds box, of a stationary frame therein, a rubber board reciprocable on said frame, a cooperating frame, a rubber board thereon, links suspending the last-mentioned frame from the other frame, a rock shaft, links engaging the rock shaft and the suspended frame, a lever on the rock shaft, and a toothed sector on the stationary frame with which a toe on the lever may engage.

2. In a washing machine, the combination with a suds box, a stationary frame therein a ribbed rubber board reciprocal on this frame, means for reciprocating said rubber board, a second frame that is laterally adjustable, a rubber board fixed on said frame, and means for adjusting the second frame, of a device for feeding fabric upward between the rubber boards consisting of a roller journaled at its ends in the second frame near the lower end thereof, a similar roller journaled in boxes slidable on the second frame above the other roller, springs pressing on said boxes, and means for rotating the rollers toward each other.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DAVID A. SAWYERS.

Witnesses:

E. M. PHILLIPS,
C. W. TAYLOR.