C. E. HOOVER.

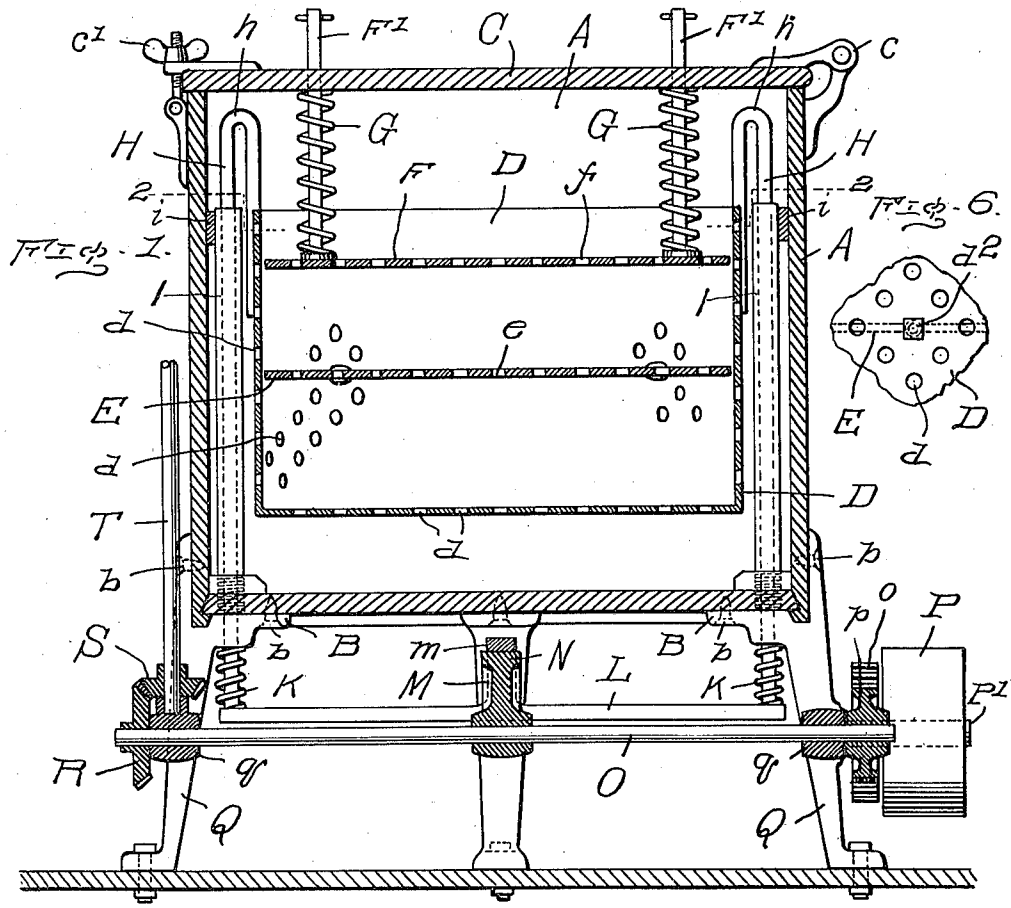
WASHING MACHINE.

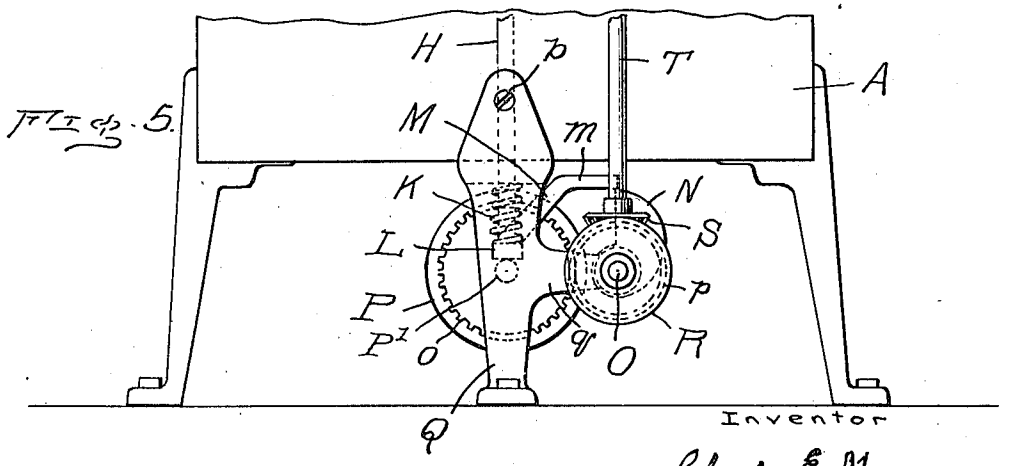
APPLICATION FILED FEB. 25, 1918.

1,292,780.

Patented Jan. 28, 1919.

2 SHEETS—SHEET 1.





Inventor

Charles E. Hoover

by

Wm. H. Babcock & Son

Attorneys.

C. E. HOOVER.

WASHING MACHINE.

APPLICATION FILED FEB. 25, 1918.

1,292,780.

Patented Jan. 28, 1919.

2 SHEETS—SHEET 2.

FIG. 2.

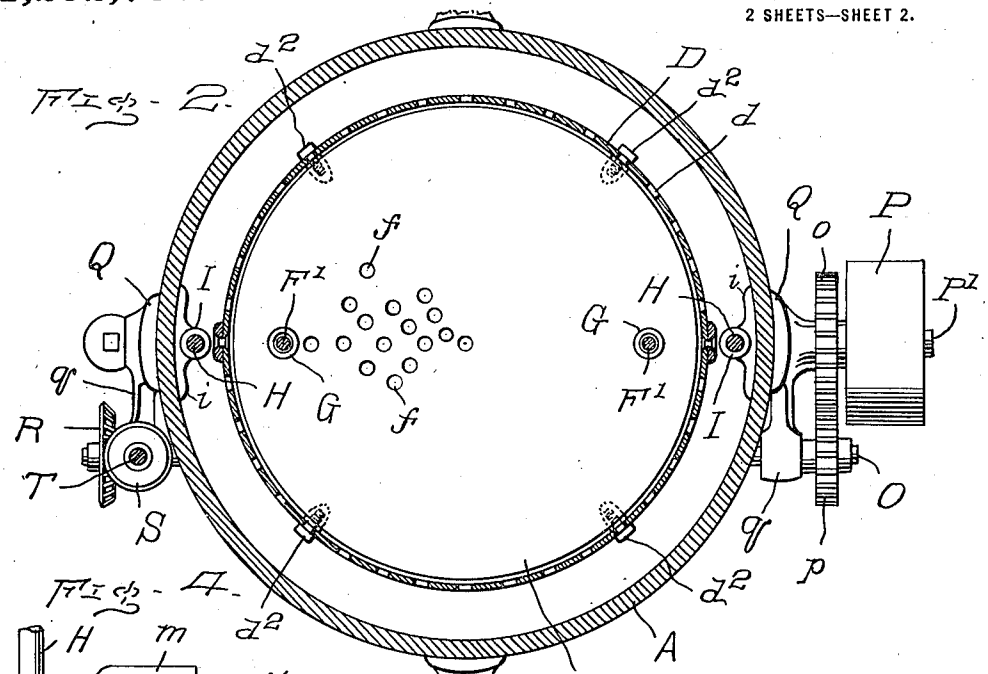


FIG. 4.

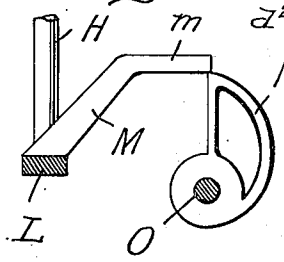
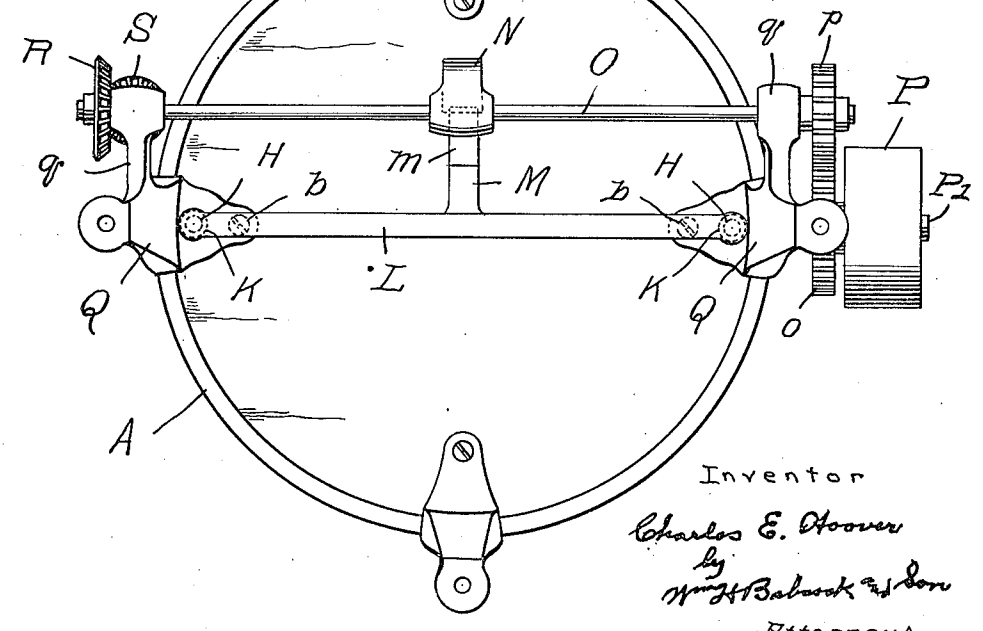


FIG. 3.



Inventor

Charles E. Hoover

by

Wm. H. Babcock & Son

Attorneys

UNITED STATES PATENT OFFICE.

CHARLES E. HOOVER, OF LANCASTER, PENNSYLVANIA, ASSIGNOR TO ABRAHAM M. DELLINGER, OF LANCASTER, PENNSYLVANIA.

WASHING-MACHINE.

1,292,780. Specification of Letters Patent. **Patented Jan. 28, 1919.**

Application filed February 25, 1918. Serial No. 219,060.

To all whom it may concern:

Be it known that I, CHARLES E. HOOVER, a citizen of the United States, residing at Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Washing-Machines, of which the following is a specification.

This invention relates to washing machines having a movable perforated cage for containing the articles to be washed, the same being located within the water-containing receptacle or reservoir. The chief object of my invention is to provide for continuous reciprocation of such a cage with adequate forcing of water through many perforations above or below the articles washed at each upward or downward movement of the cage, thus obtaining the full washing action at both ends of the stroke. As parts of the mechanism above described I employ a perforated upper plate, spring-held on top of the clothes, but yielding to any increased supply of contents. I also provide perforated adjustable means for dividing the interior of the cage into two or more parts so that two or more grades or kinds of articles may be separately washed by the same action without preventing full cleansing, and the relative spaces given them may be varied as required. The reciprocation of the cage is caused by the opposing action of a cam or equivalent mechanical means and a spring or springs acting on duly braced and guided supports for said cage. There are also divers new and improved features of detail which will be more fully hereinafter described and claimed.

In the accompanying drawings Figure 1 represents a vertical approximately central section, on a plane proximate and parallel to that of the rods F′ and H hereinafter described, through a washing machine embodying my invention, the usual wringer attachment not being shown.

Fig. 2 represents a horizontal section on the line 2—2 of Fig. 1;

Fig. 3 represents a bottom view of the same;

Fig. 4 represents an enlarged detail view of the cam and the bent arm against which it acts to lift the cage;

Fig. 5 represents a detail view in side elevation of the middle supporting leg and proximate parts;

Fig. 6 represents in detail side elevation a part of the cage showing holes for adjusting partition by screws.

A designates the tub, receptacle or reservoir for containing water, either pure or as part of any suitable laundry solution or mixture. This receptacle may have any convenient form but is shown as cylindrical. Its material may be wood, metal or any other suited to its uses. It is supported by strong slanted legs B, preferably of cast metal, bolted to the floor and connected to the lower part of said receptacle by screws *b* or in any convenient way. Said receptacle has a lid C hinged at *c* to the tops of its body and fastened down at will by any suitable catch indicated at C^1.

Within said receptacle a perforated metallic cage D reciprocates vertically. It is shown as cylindrical but this form, though most convenient, is not essential. Its bottom is provided with many perforations *d*, as are also all parts of its side wall. These small holes *d* in said side wall at various elevations provide for the vertical adjustment by screws d^2 of a horizontal partition E, which has perforations *e* like the perforations *d* aforesaid, this partition dividing the interior space into two compartments of variable size, so that clothes of different kinds or grades or ownership may be simultaneously washed in the same cage, without mixing them or even bringing them into contact with each other, although there is no impediment to the flow of water through all the clothes in the upward or downward movement of the cage. The adjustability of the partition makes feasible the maintaining of this arrangement notwithstanding the difference in the mass of the two bodies or sets of articles. Of course by using more than one partition the number of such compartments and number of sets or masses of

garments washed simultaneously but separately in the same cage may be increased at will.

F designates a top plate provided with many perforations *f* similar to perforations *d* and *e* aforesaid and suspended from lid C by rods F^1 which may slide up and down through said lid within certain limits. Springs G surround said rods below said lid and bear on said top plate, tending to hold the latter against upward movement with said cage but yielding under pressure and permitting the increase of the volume of the clothes in the cage without perceptible change of the operation of the parts. The said top plate has the same outline as the top of the cage-body and is but slightly less in diameter, fitting said body sufficiently to prevent undue splashing of the water out of the top of the cage around the border of the said top plate yet not obstructing the upward and downward movement of said cage.

The receptacle A being duly supplied with water by hand or in any other convenient way, each downward movement of the cage will force the water up through the holes *e* in the bottom plate and body and through the clothes, escaping at the top through plate F. The corresponding upward movement of the cage similarly forces water in the reverse direction down through holes *f* of plate F′ and holes *e* in the body of the cage and through the contained clothes, escaping finally through the bottom of said cage. In each movement there will be a certain escape also of the water through the holes *d* in the upper or lower part of the cage as the case may be. The general operation is of an alternately reversed current of water driven through the clothes from top to bottom of the mass and from bottom to top again with penetration and escape of oblique side jets acting similarly on the clothes but in less degree. The total effect is of a very thorough cleansing, the water being applied equally from above and from below and the action of the mechanism guarding against any imperfection or unevenness of the application of force and flow.

To cause this automatic action, I employ positively acting mechanism (preferably a shaft and cam) and opposed resilient means acting reversely to each other on movable cage supports. As shown these supports are rods H bent over at their upper ends *h* for convenience of attachment to the upper part of the cage. These rods are guided by long upright tubes I, arranged between the cage D and the wall of the receptacle A, these guide tubes being held at their upper ends to said receptacle body by brackets *i*. The lower ends of said tubes are screwed into the bottom of said receptacle and provided also with bushings *j*, which bear down against said bottom. Each rod H passes below its tube I through a horizontal ledge B of one of the legs Q supporting the machine and has a depressing spring K arranged around it between the bottom of said ledge and a movable cross bar L, to the ends of which the lower ends of said rods H are connected. A rigid arm M extends upward from the middle part of this cross bar and is bent to present a horizontal rigid finger *m* above a cam N of any convenient form which is carried by a rotary cam-shaft O. This may be driven by means of belt-pulley P on a short drive shaft P′ and intervening gears *o p*, but the precise means shown for driving the shaft and of actuating the cage are not essential. The operation is simply that of the upward pressure of the cam raising the cross-bar rods and cage and compressing springs K; which being seated against fixed ledges B^1, bear downward on said cross-bar and promptly reverse the movement of the said cage, rods and cross-bar when the upward pressure is removed. Thus a rapid and efficient reciprocatory action of the cage is effected, the movement being exactly of the same extent each time in each direction and applied with the same degree of force in each upward lift and in each downward pressure.

One of the two pairs of diametrically opposite legs Q has a rigid lateral arm *q*, on each leg. These arms supply bearings for said cam shaft. One of these legs also provides a bearing for the stub shaft P′ of belt wheel P.

The said cam shaft bears a bevel wheel R, which meshes with a similar bevel wheel or pinion S, for driving the shaft T of a wringer, commonly attached to such washing machines. As the wringer forms no part of the present invention and is not at all necessary to the comprehension of the same, it is unnecessary to illustrate it and the bevel gear and shaft are merely presented in incidental illustration, as they would ordinarily belong to a complete commercial machine.

If the receptacle A were turned into horizontal position instead of vertical, with the inclosed elements and attachments and the cage were reciprocated horizontally instead of vertically there would be no change in the invention, though there might be less convenience and greater need for care to prevent escape of water. Obviously the vertical position is ordinarily the best. But as already indicated I do not restrict myself to this nor to the exact form or construction described.

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

In a washing machine, the combination

of a water-containing receptacle with a clothes-containing cage, reciprocating therein, rods attached to said cage, fixed guide tubes for said rods, a cross bar connecting said rods, springs bearing on said cross-bar for moving said rods and cage in one direction and mechanism acting on said cross bar to move said rods and cage in the opposite direction, for the purpose set forth.

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

CHARLES E. HOOVER.

Witnesses:
ALLAN B. WALLACE,
CHAS. GOOZ.