E. P. & E. Doty.

Washing-Machine.

No. 73701 Patented Jan. 28, 1868.

Fig. 3.

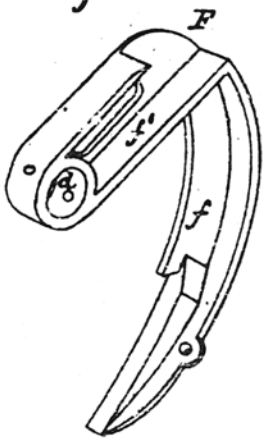


Fig. 1.

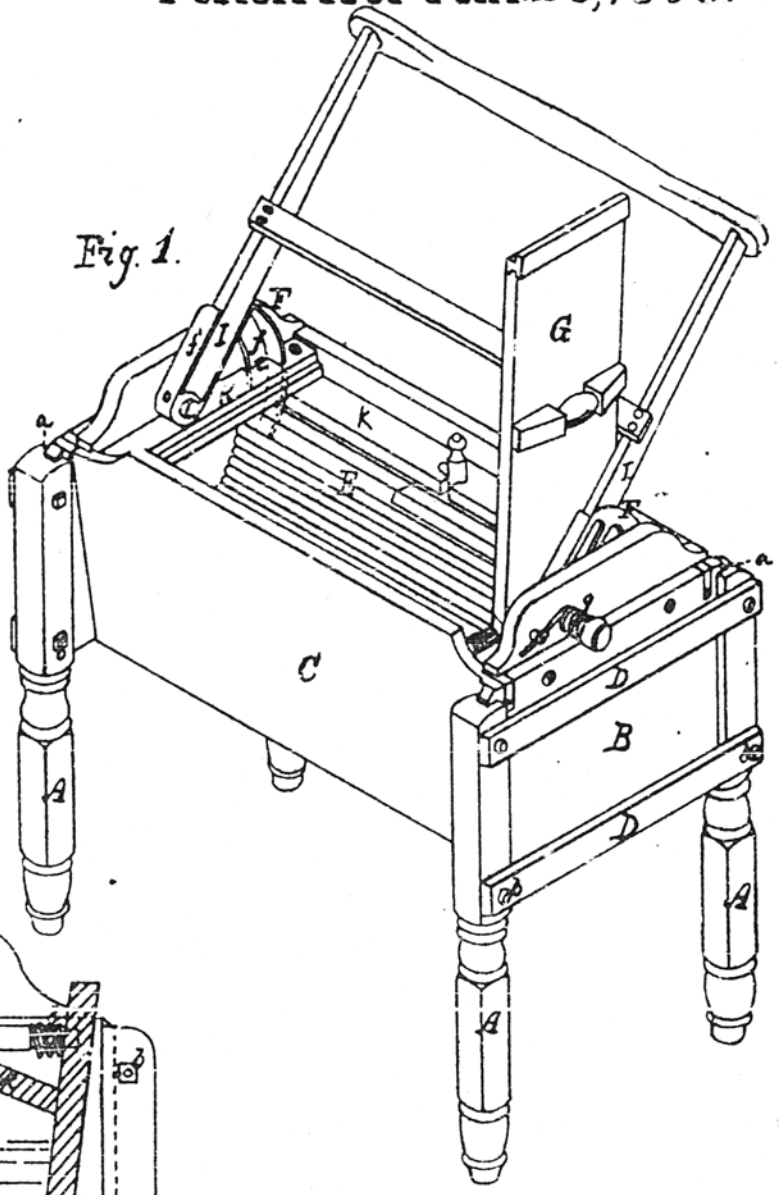
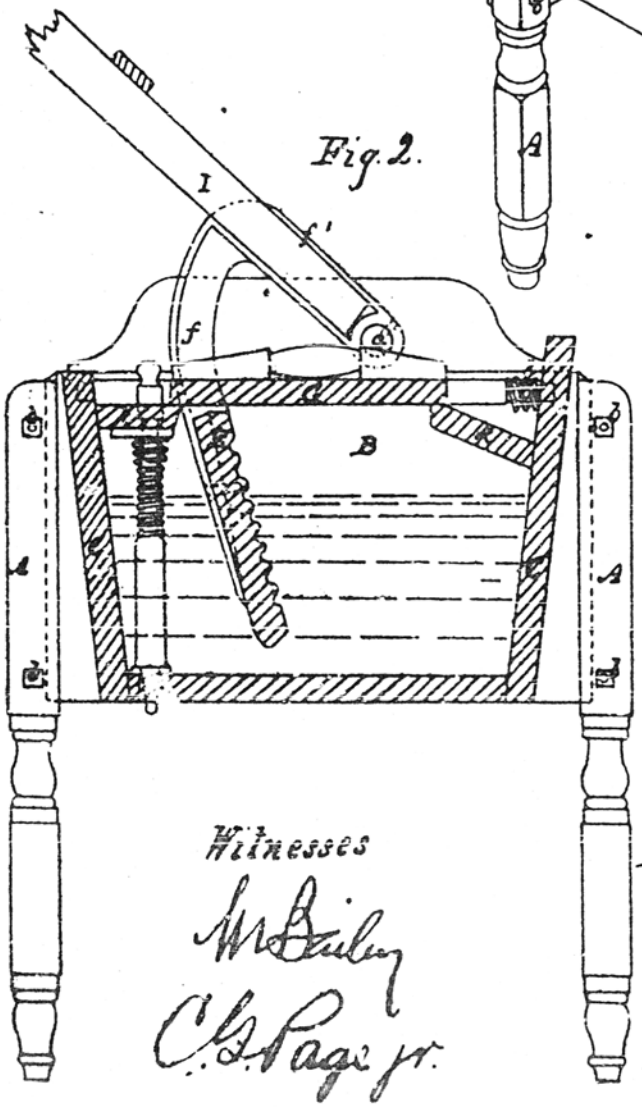


Fig. 2.



Witnesses

M. Bailey

C. L. Page jr.

Inventor

Eugene Philo & Ellis Doty

by

A. Pollok

Attorney.

EZRA PHILO DOTY AND ELLIS DOTY, OF JANESVILLE, WISCONSIN, ASSIGNORS TO THEMSELVES AND WILLIAM M. DOTY, OF NEW YORK CITY.

Letters Patent No. 73,701, *dated January* 28, 1868.

IMPROVED WASHING-MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

TO WHOM IT MAY CONCERN:

Be it known that we, EZRA PHILO DOTY and ELLIS DOTY, of Janesville, in the county of Rock, and State of Wisconsin, have invented certain new and useful Improvements in Washing-Machines; and we hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a machine to which our improvements are applied.

Figure 2 is a transverse vertical section of the same, and

Figure 3 is a separate view of the segmental arm which supports the vibratory handle or lever.

Our improvements relate to washing-machines of the kind for which Letters Patent of the United States were issued to William M. Doty, on the 12th July, 1864, and they have reference—

I. To the method of hanging the oscillatory washing-board, and lever or handle by which the same is operated.

II. To the arrangement of the cover for the tub.

III. To the frame in which the tub is held.

I. The means heretofore employed for hanging the wash-board and lever are possessed of certain defects, which somewhat detract from the entire success of the machine. The pendent vibratory arms employed for this purpose have been made of wood, and in such manner as to require openings of considerable size in the top or cover of the tub to admit of their play, and also to allow for their swelling, which takes place when they become saturated with the water in the tub. These openings, which, for the above reasons, are of greater width and breadth than the arms which play through them, afford a passage for the heat from the water, which will consequently cool much more rapidly than if the tub were closed tightly against the escape of the heat. This is a matter of some importance to guard against, as one of the conditions for the successful operation of the machine is that the water or suds should have a high degree of heat. To this end our invention consists, first, in hanging the wash-board upon a segmental arm, the centre of the curve being the pivotal point upon which the arm is suspended; second, in forming the socket for the lever-handle in the radial arm which unites the segmental arm with its pivotal point; third, in forming the bowed or segmental arm of angle-iron, so as to reduce the size of the opening in the tub through which the arm plays without detracting from the strength of the arm itself.

Owing to the segmental form of the arm, every point on the curve is equidistant from the pivotal point which forms its centre, so that the opening in the top of the tub, through which the said arm plays, can be made just large enough to fit it, thus obviating the necessity for leaving any open space around the arm, which, being of metal, does not shrink. By giving the arm an angular formation, its size, and consequently the size of the opening, is further reduced, so that all evaporation or escape of the heat from within the tub is prevented as far as practicable.

II. With respect to the arrangement of the cover, and its combination with the tub, our invention consists in combining with the wash-tub a cover, hinged to it in the manner hereinafter described, so that it may be readily applied to or disengaged and removed bodily from the tub.

III. The object of that portion of our invention which relates to the frame of the machine, and its combination with the tub, is to prevent, as far as possible, the sides of the tub from splitting or cracking, and thus becoming leaky. When, as is ordinarily the case, the legs or standards are bolted directly to the sides of the tub there is unequal expansion and contraction of the wooden sides and standards—for the latter, being on the exterior of the machine, are always dry, while the former, being often soaked or thoroughly saturated as well as heated with water, swell, and are subject to considerable expansion and subsequent shrinking. In order to obviate, as far as possible, this difficulty, our invention consists, first, in uniting the sides of the tub with the legs or standards by a tongue-and-groove joint, the ends of the sides forming tongues, which fit the grooves in the standards applied to them; second, in connecting and holding together the standards on each side of the machine by means of bars or rods, which extend from one standard to the other, and are securely attached to each by means of bolts and nuts, or equivalent devices. These bars not only are the means whereby the legs are held in proper position, but also form handles, by which the machine may be lifted and carried from one place to another.

It will be seen that, while the ends of the sides are held, throughout their whole length, in the grooved standards, which fit tightly, thus preventing the warping, they are not connected with the standards by nails, bolts, or other means usually employed. The bolts which hold the standard-bars pass only through the bars and standards, and do not touch the sides of the tub. A fruitful source of the splitting or cracking of the sides

is thus obviated, and the latter are, together with the front and rear end-pieces of the tub, capable of expanding or contracting without damage resulting therefrom.

To enable those skilled in the art to understand and use our invention, we will proceed to describe the manner in which the same is or may be carried into effect by reference to the accompanying drawings.

A A are the tub-supporting standards. The sides, B, of the tub extend, on each side, beyond the front and back pieces C, and their ends constitute tongues, which fit in grooves, *a*, formed in the standards. The latter, on each side of the machine, are held together by cross-bars, D, and nuts and bolts, *b*, the bolts passing through the standards and bars, but having no connection with the sides, B. The advantages of this combination and arrangement of the standards with the tub have been above set forth, and need not be here repeated.

The swinging wash-board E is hung in position within the tub by means of the metal arms F, to the lower ends of which it is secured. In order to illustrate more clearly the form and construction of the arms, one of them is represented in fig. 3 as detached from the machine. The arm consists of two parts, the bowed or segmental arm *f*, and the radial arm *f'*. The curve of the arm *f* is that of a segment of a circle, having for its centre the pivotal point *c*, around which it swings; and the upper extremity of the segment is united with the pivot by means of the radial arm *f'*, having on its end a socket, *d*, which fits upon the pivot. In order to decrease the size of the arm, and consequently the dimensions of the opening, *e*, in the top of the tub, through which it moves, we form it of angle-iron, as represented in fig. 3, which admits of it being greatly reduced in bulk at the same time that it retains the requisite degree of rigidity and strength.

The radial arm *f'* is cast or otherwise made in the form shown in the figure referred to, so as to constitute a socket, in which the lever or handle I, for operating the bar, may be inserted, as seen in figs. 2 and 3.

The two arms F are hung in the machine in the usual manner, springs, *g*, being applied to them in such manner as to draw back the board after each vibratory forward movement. The openings *e* in the top of the tub, through which they play, are made small, so as to just fit around them; and there is, therefore, at these points, but little, if any, opportunity for the escape of heat.

The top of the tub is partially covered by stationary pieces, K K, projecting from the respective sides of the tub. The central opening formed by them is closed by a cover, G, hinged laterally to the machine, as shown in fig. 1. As this cover is hinged, it constantly stands in its proper relation to the opening, and can be swung up or down, to open or close the tub, as desired. Considerable annoyance and loss of time are occasioned by the use of a loose or detached cover, as has heretofore been customary, which it is often extremely troublesome to fit or adjust in proper position over the opening. By hinging the cover to the tub, we overcome this difficulty; and, at the same time, in order to provide for the ready removal of the cover bodily from the machine, which, in some cases, it is convenient to do, one of the bearings, *l*, of the cover is made of considerable length, so as to be capable of sliding lengthwise in its socket, which is correspondingly elongated. By slipping the longer bearing back in its socket, moving the cover laterally for this purpose, the shorter bearing will be drawn out from its socket, and the cover can then be readily detached from the tub, as will be understood without further explanation.

In order to prevent the accidental lateral play of the cover, a spiral spring, *m*, is mounted upon the longer bearing *l*, so as to press and hold the shorter bearing in its socket, and prevent its accidental displacement.

The hinging of the cover laterally to the tub is, moreover, advantageous, from the fact that it can be swung up or down without interfering with the operation of the machine itself, or the wringer, which is usually attached to or mounted upon the rear of the tub.

The board E, in its upward or backward movement, will be arrested by the side pieces K, against which it will strike before it can reach the cover. The latter is thus not liable to be raised or thrown out of position by being knocked against by the board, and is thus secured against a cause of displacement which has heretofore existed in these machines.

Having now described our invention, and the manner in which the same is or may be carried into effect, what we claim, and desire to secure by Letters Patent, is—

1. The segmental arm for carrying the wash-board, the centre of the curve of said arm being the pivot or axis upon which it oscillates, substantially as and for the purposes herein shown and described.

2. The combination, with the segmental arm, of a radial arm, which, while uniting the segmental arm with its pivotal point, constitutes a socket for the lever-handle, substantially as and for the purposes set forth.

3. Forming the bowed or segmental arm, which carries the wash-board, of angle-iron, so as to reduce the size of the opening in the tub, through which the said arm plays, without detracting from the strength of the arm itself, substantially as shown and set forth.

4. The combination, with the wash-tub, of a hinged cover and spring, or its mechanical equivalent, applied to the cover-hinge in the manner described, so that the cover may be readily adjusted to or removed bodily from the tub, substantially as and for the purposes shown and set forth.

5. The combination, with the legs, when united with the wash-tub by a tongue-and-groove joint, as described, of the braces or handles, extending between the legs, and attached to each, in the manner and for the purposes shown and set forth.

In testimony whereof, we have signed our names to this specification before two subscribing witnesses.

EZRA PHILO DOTY,
ELLIS DOTY.

Witnesses:
S. A. HUDSON,
W. A. LOWELL.