(No Model.) 2 Sheets—Sheet 1.

J. W. BALLARD.

STEAM WASHER.

No. 382,289. Patented May 8, 1888.

Fig. 1.

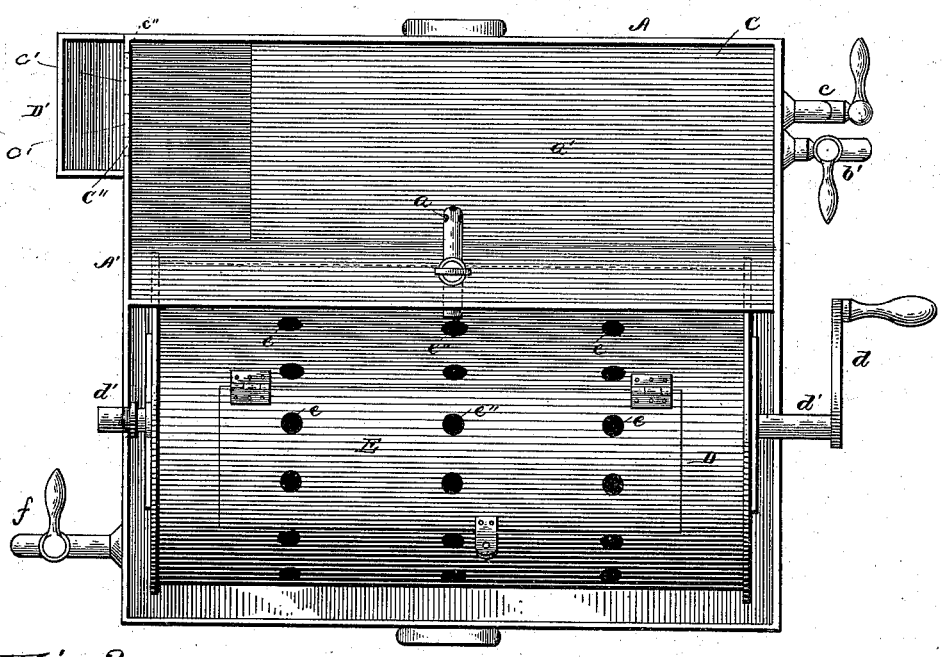
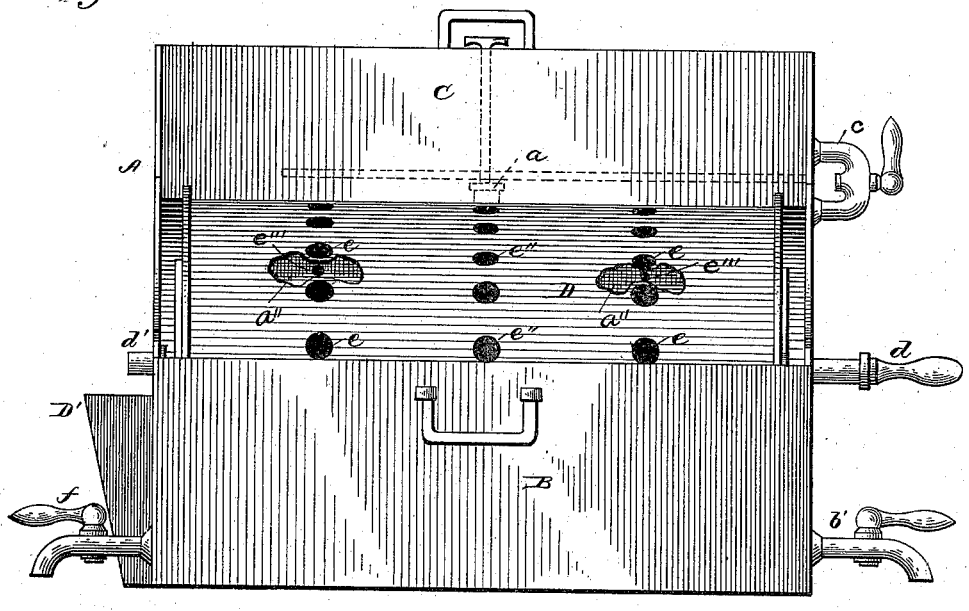


Fig. 2.



WITNESSES

Edwin I. Yewell.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

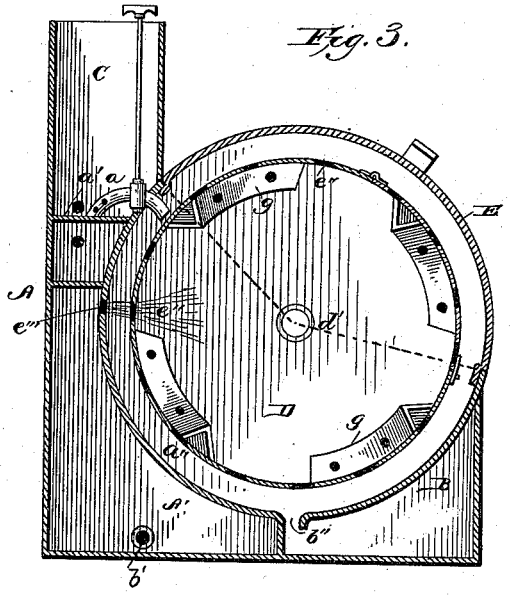
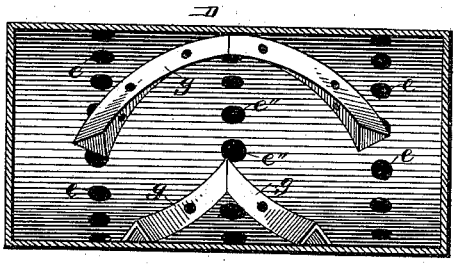


Fig. 4.



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UNITED STATES PATENT OFFICE.

JORDAN W. BALLARD, OF WILMINGTON, OHIO.

STEAM-WASHER.

SPECIFICATION forming part of Letters Patent No. 382,289, dated May 8, 1888.

Application filed January 24, 1887. Serial No. 225,406. (No model.)

To all whom it may concern:

Be it known that I, JORDAN W. BALLARD, a citizen of the United States, residing at Wilmington, in the county of Clinton and State of Ohio, have invented certain new and useful Improvements in Steam-Washers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in steam-washers.

My invention relates to that class of steam washing-machines in which steam is used in connection with water in eliminating the dirt from the clothes, which machines are usually tilted steam-washers; and it consists in certain improvements in the several parts of a steam-washer, by which the removal of the dirt from the clothes is facilitated, and the time and labor are thereby lessened, all of which is fully described in the specification, and is more particularly set forth and pointed out in the claims.

Figure 1 is a top view of a steam-washer having my improvements embodied therein, the cover over that part containing the cylinder being removed. Fig. 2 is a front elevation of the same. Fig. 3 is a vertical section. Fig. 4 is a longitudinal section of the washing-cylinder.

My steam-washer is preferably made of galvanized sheet-iron or other non-oxidizable metal throughout. The stationary part is of substantially square form on the bottom, to adapt it for an ordinary cooking-stove top, the sides of the washer being vertical and parallel on the outside. The back portion is nearly of the same measurement in height as the width of the bottom, and it contains a water-tank at the top. Below this and extending forward to a point vertically under the axial line of the cylinder is a large compartment used as a steam-generator. Forward of the generator and occupying the remainder of the lower front portion of the case is the drip-water chamber. A long narrow opening extending the full length of the washer allows the water from the cylinder to pass into the drip-water chamber. The top of the case from the tank forward is concave to receive the cylinder, which latter is hung upon journals in the side walls of the concave part, and is operated by a crank at one end. The cylinder is perforated with holes for admitting water and steam. It has also on the inside angular ribs for carrying the water from the middle of the cylinder toward either end when operated in one direction, and when reversed in its operation for bringing both the clothes and water toward the center. The cylinder bearings or journals are hollow, and the journal opposite the crank end can be utilized for allowing the escape of steam that may be forced out by the manipulation of the cylinder and contents.

A is the case of the washer. It is divided into three compartments, A′, Fig. 3, being the generator, which latter extends from the rear wall of the case forward to a point vertically under the axial line of the cylinder, where it is separated from the drip-chamber B by its low front wall. A longitudinal opening extending the full length of the case at this point, as at *b″*, extends from the concave *a″* of the case down into the drip-chamber, allowing the water from the cylinder, after being used, to pass freely into this chamber. The generator at the back part is about two-thirds the height of the rear part of the case, the remaining half being taken up by the feed-water tank C. This latter, in addition to its true bottom, has also a false bottom, *a′*, which extends about four-fifths its length, and is located a little distance above the bottom proper. This bottom allows the inner end of a discharge-cock, *a*, (seen on the inside of the tank C near the front side,) to rest thereon. The function of the cock *a* will be explained hereinafter.

The opening at the end of the false bottom *a′* allows space for cleaning the tank, and the use of the false bottom is for the purpose of strengthening the tank C, giving a seat for the cock *a* and its pipe, and as it can be more easily seen (from its elevation in the tank) than the bottom proper it can be more easily freed from impurities and kept clean, so as to allow no sediment to pass out through cock *a* in slushing the clothes contained in the cylinder.

From the lower front angle of the tank C

forward to the top of the front wall of drip-water tank B the case is made concave, this concavity a'' being semi-cylindrical to adapt it to the cylinder D, which is hung in bearings in both side walls, the latter being defined by the dotted lines extending from the lower front angle of the tank C and from the top angle of drip-water tank B to the bearing d', the cover E over the cylinder completing the circle of the concave a'' and its ends extending down on either side of the case to the dotted lines mentioned, and thus effectually inclosing the washing-cylinder D.

The cylinder is of circular form, is hung centrally upon the axial journals d' d', and has a crank, d, at one end to operate it. It is perforated with holes e e''. These are of uniform size, and about three-fourths of an inch in diameter. Opposite to and coincident with the outer rows of holes are two much smaller holes, e''', in the front wall of generator A', just below the bottom of tank C, as seen in Fig. 3. These holes e''' e''' allow the steam as it becomes generated to escape outward toward the front through holes e e into the cylinder D among the clothes. Opposite to and coincident with the middle line of holes e'' e'' in the cylinder is the nozzle of the discharge-cock a, which protrudes through the lower (concave) front wall of feed-water tank C, at the middle of the latter. This cock has a long stem which extends above the top of the tank. This cock is used to discharge the hot water from the tank C through holes e'' e'' into the cylinder to slush the clothes and carry off the dirty suds therefrom. Cylinder D is provided with internal A-shaped ribs, which are placed in angular form on the inside surface. These ribs connect at the center or middle line of the cylinder, and diverging from this line outward they terminate before reaching the ends. These ribs g, as seen in Figs. 3 and 4, are of sheet metal and soldered to the inside surface by their edges, leaving the bent part forming the angle of the rib projecting inwardly. They are also perforated with holes similar to those in the shell of the cylinder D. The object of these ribs is to keep the clothes from packing close to the inside surface of the cylinder in operating the latter, and also to allow of the free distribution of both water and steam among the clothes in the process of washing in its first stage. These ribs also allow the water to escape from the clothes as the latter are turned over by operating as conductors, carrying the water from the middle toward their outer ends when it is desired to discharge the water from the clothes. In reversing the operation they serve to conduct the water to the middle of the cylinder, and also serve to gather the clothes toward the same point when the cylinder is rotated in a reverse direction to that first described.

On one end of the case A (seen at the left in Figs. 1 and 2) is a hopper, D'. This is about two-thirds the height of the generator, and its width is a little more than half its height. It is of tapering form, open at the top and about two inches wide at the bottom, which is on the same level with that of the bottom of the case. This hopper communicates freely with the inside of the generator through holes c'' c'' near the bottom in the division-wall c', as seen in Fig. 1.

The generator may be fed either through this hopper D' or it may be fed from the feed-water tank C through the U-shaped pipe and cock c. (Seen on the right of the view, Figs. 1 and 2.) A cock, b', under c in Fig. 1 at the same end, is used to discharge the water from the generator to clean it. The cock f, for discharging the water from the drip-water tank, is shown in Fig. 1 on the left end. The location of either or any one of these cocks is not material. The U-shaped pipe and cock c is preferably placed opposite to the hopper side. This cock communicates with both tank C and the generator A', and can be used to supply the latter with water.

In operating my improved steam-washer the feed-water tank is first filled, and then three or four inches of water are filled into the generator A' either by drawing through c or filling it to the proper height by pouring water into hopper D'. It is then heated from the stove on which it is placed. During the process of washing, the generator is always fed from the water-tank C through pipe c; but the hopper D' answers at all times as a gage to show the height of water in the generator and also as a ready means for filling the generator with cold water at first with a pail. The clothes, after being thoroughly soaped on the dirty parts, are placed in the cylinder D by opening the door E, which is closed in the usual manner. As the steam fills the top of the generator, it issues from the holes e''' in the top of the concave wall, and as the holes e e in the cylinder come in range with holes e''' e''' the steam is forced into the cylinder through them, and is thoroughly diffused through them as the cylinder is operated. The cover E prevents the escape of the steam. As the clothes are agitated by wholly or partially rotating the cylinder, the steam which has done its work is forced out of the hollow journal d' at the left end of the cylinder. This hollow journal may at first be closed with a plug or cork during the first part of the process when it is desired to retain all the steam possible in the cylinder. All the dirty drip-water is carried into the tank B through the opening b''. After the clothes are thoroughly agitated and subjected to all the steam necessary, they are slushed by means of water let onto them through holes e'' from the discharge-cock a, the water in tank C being made at any desired temperature by the addition of cold water, should this be necessary.

It is preferable to slush the clothes with moderately hot water from the tank C as soon as the dirt is known to be loosened, so as to easily wash out. At this time the use of the diagonal ribs g g becomes apparent. As the

cylinder is operated in the direction of the converging ends or meeting points of these ribs *g*, to carry the excess of water toward the ends of the latter, the clothes are moved in the same direction, and by reversing the operation the clothes and water are carried toward the middle part of the cylinder, thus making the operation thorough and effective, and by exposing all parts of the clothes to the operation of both the steam and water the time and labor of washing are materially lessened.

I claim as my invention—

1. In a steam-washer, the combination, with a revoluble perforated cylinder for operating the clothes by rotation and agitation, of a steam-generator having a reservoir or tank above it, a U-shaped pipe and cock in the latter communicating with both tank and generator, the latter being provided with holes coincident with lines of holes in said cylinder, and said tank having a slushing-pipe coincident with the middle line of holes, regulated by a stop-cock, and a drip-water chamber separated from said generator and having an opening under said cylinder extending from side to side of the case of said steam-washer, substantially as and for the purpose hereinbefore set forth.

2. In a steam-washer, the combination, with the case having a steam-generator, and a feed-water tank above the latter having a discharge-cock leading therefrom, of a clothes-cylinder provided with holes coincident with discharge-holes in said steam-generator and with said discharge-cock, said cylinder having the inclined or diagonal ribs diverging from the middle line of said cylinder and from the middle line of holes coincident with said discharge-cock, and said case provided with a drip-water chamber beneath said cylinder adapted to receive the waste water from the latter, and both feed-water tank and drip-water chamber being provided with outlet-pipes and stop-cocks in the same, substantially as set forth.

3. In a steam-washer, the combination, with the steam-generator provided with the discharge-holes *e‴ e‴*, of a revoluble clothes-cylinder having holes *e* coincident with said discharge-holes, and diagonal ribs diverging from the middle line of the cylinder provided with holes therein for receiving and conducting the steam, and for the purpose described, substantially as hereinbefore set forth.

4. In a steam-washer, the combination, with the generator having steam-discharge holes, and the water-tank above said generator having a discharge-cock, of the inclosed clothes-cylinder having holes coincident with the holes in the generator and with the discharge-cock of the water-tank, tubular diagonal ribs in said cylinder, also perforated with holes, a hollow journal at one end of said cylinder for escape of excess or waste steam, and the drip-water chamber having an opening in the top, as and for the purpose hereinbefore set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JORDAN W. BALLARD.

Witnesses:

C. W. SWAIM,

GEORGE J. GRUBBS.