UNITED STATES PATENT OFFICE.

FERRIS FRELIGH, OF RODNEY, MISSISSIPPI.

IMPROVEMENT IN WASH-BOARDS.

Specification forming part of Letters Patent No. **215,905**, dated May 27, 1879; application filed December 9, 1878.

To all whom it may concern:

Be it known that I, FERRIS FRELIGH, of Rodney, in the county of Jefferson and State of Mississippi, have invented a new and Improved Wash-Board, of which the following is a specification.

The object of this invention is to provide a wash-board constructed in such a way that the material will be subjected to a thorough rubbing on the surface of the board, and also to regulate the friction between the material and the board.

The invention consists in pivoting between the rails of a wash-board rolls or bars, and providing them with suitable means for being locked, all or every other one of them.

It also consists of an arrangement for holding the bars stationary or braking them, so as to increase the tension, and thus add to the resistance in the rubbing of the clothes.

In the accompanying drawings, Figure 1 is a front elevation of my improved wash-board. Fig. 2 is a vertical section of the same, and Fig. 3 is a side view of the board.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the top of the wash-board, and B B are the side rails, connected together by cross-pieces *a a*, and a partition, *b*, dividing off a space, *c*, to hold soap, &c. The rubbing-surface of the board is composed of bars C, provided with spiral ribs running lengthwise of the bars. These bars are pivoted in the side rails B B, as clearly shown in Fig. 1.

The rubbing-surface of the board may be composed entirely of these spirally-ribbed bars arranged so that alternate bars have their spiral ribs running in opposite directions. For instance, the first bar from the top may have its ribs in a right-and-left spiral, and the next one left and right, and so on, the object being to subject the material to a diagonal rubbing, one set of ribs rubbing from right to left, and the other from left to right, thus crossing each other. Thus, when the material is rubbed downward, the projecting spiral rib of the first bar will rub diagonally from left to right, while the next one rubs from right to left, and so on.

D represents straight-ribbed bars, which may be pivoted in the side rails between each pair of spirally-ribbed bars, or between every two, as may be preferred. The object of these is to give a straight rubbing-surface at right angles to the direction in which the material is rubbed, and thus cross the diagonal rubbing-lines of the spirally-ribbed bars.

The pivots of one half of the spirally-ribbed bars project through the one side or rail of the board, while the ends of the other half project through the opposite side, and the projecting part is cut into tenons, as shown at *d*. Over these projecting tenons *d* are placed, one on each side, the locking-plates E E, provided with slots *e e* at each end, through which are passed set-screws *f f*.

The projecting tenons are passed into the openings *g*, composed of a round hole from which proceeds a slot. These locking-plates can be moved up and down by loosening the set-screws *f f*, and secured by them at any point, and each plate controls one-half the bars in alternate order—that is, the first and every other bar projects into the locking-plate on the left in Fig. 1, while the alternate bars project into the plate on the right. The purpose of these plates is to either lock the bars, and thus prevent them from turning, or else to serve as brakes to make them resist the rubbing of the material, and thus increase the friction. For the first of these purposes the locking-plate is loosened (on one or both sides, as one-half or all the bars are to be fixed) and the tenons slipped out of the round holes into the slots, and when all are in on one or both sides the plate is secured by the set-screws, and if all the bars are secured the board presents a fixed surface for rubbing the material on; but if one-half only are secured, then it will be partly fixed and partly movable, and thus the effects of both are obtained. To increase the resistance to the rubbing without fixing the bars, the locking-plate on one or both sides is slipped up so that the sides of the round holes will bear against the tenons, and thus serves as a kind of brake that increases their resistance to the movement or rubbing of the material.

The straight-ribbed bars may be used or not,

L. B. FULTON & J. PROEGER.

Injector.

No. 215,906. **Patented May 27, 1879.**

Fig. 1.

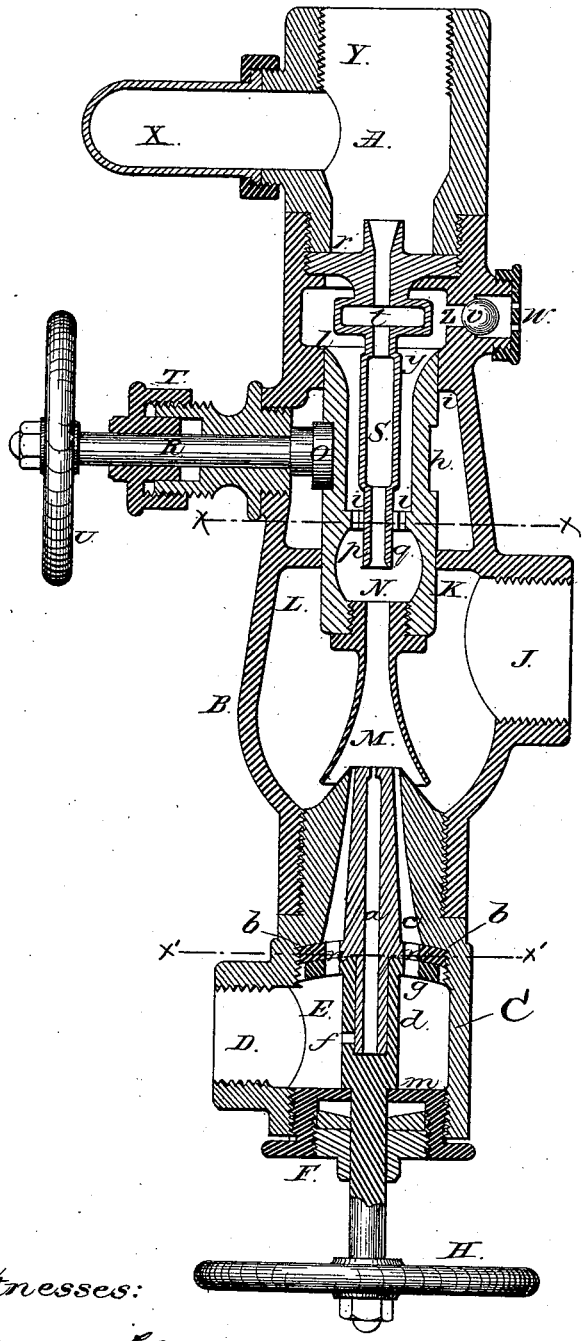


Fig. 2.

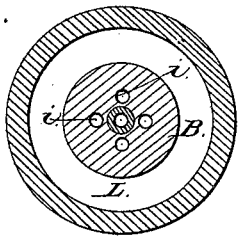
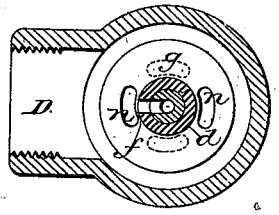


Fig. 3.



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UNITED STATES PATENT OFFICE.

LOUIS B. FULTON AND JULIUS PROEGER, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN INJECTORS.

Specification forming part of Letters Patent No. **215,906**, dated May 27, 1879; application filed December 9, 1878.

To all whom it may concern:

Be it known that we, LOUIS B. FULTON and JULIUS PROEGER, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have made certain new and useful Improvements in Injectors, which are fully described in the following specification and accompanying drawings.

The invention relates to that class of mechanical contrivances used for the purpose of lifting and forcing water by the direct application and action of steam under pressure.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a longitudinal section of the apparatus. Fig. 2 is a transverse section of the same on the line X X, and Fig. 3 is a similar section on the line X′ X′.

The cylindrical portion of this injector is cast in three sections, A B C, which are united by screw-joints, so as to be readily taken apart or put together.

In the illustrations the apparatus is arranged vertically, which, however, is not essential; but it will be thus described. The lower section, C, includes the steam-chamber E, and is provided with the lateral neck D as its inlet, which may be attached to a steam-generating device by suitable connections. One end of this section is tapered on the inside, and in the tapering portion is arranged an open-ended tube, *a*, having at or near its middle a perforated disk-like flange, *b*, of diameter equal to that of chamber E, and so secured therein as to maintain with relation thereto an axial position, leaving an annular space, *c*, between the tube *a* and the surrounding wall of the chamber.

Over the lower end of the tube *a*, nearest the steam-inlet D, is placed a movable tube, *d*, which incases the stationary tube *a* in such a manner as to make the joint between the two steam-tight; but for the purpose of admitting steam to enter the central orifice of the stationary tube, it and the incasing-tube are each provided with a small lateral opening, *f*, which, when brought opposite to each other, allow the steam from chamber E to pass in an unobstructed course until it reaches the extreme end of the stationary tube *a*, which is suddenly contracted at that point for the purpose of giving a greater velocity to the steam on its exit therefrom.

Next to the perforated disk *b* on the fixed tube *a* is arranged a smaller but movable disk, *g*, forming a part of the incasing-tube *d*, so as to turn with it, and this small disk is perforated in the line of its axis in two places outside of its center, corresponding in size and position to the perforations *n n* in the first-mentioned disk. The adjacent faces of the disks are so fitted, the one to the other, as to make a steam-joint.

A continuation of the incasing-tube *d* beyond the point where it overlaps the stationary tube is made solid, and extends outward through a stuffing-box, F, screwed into the lower end of the steam-chamber E, and is so constructed as to bear against a shoulder, *m*, on the stem, and thereby force the disks together. The outer end of this stem is provided with a hand-wheel, H, by which it may be turned to change the relative positions of the several small steam-passages in and through the disks and tubes, so that the steam may be made to pass either through the stem and in closed central tube or wholly through the openings *n n* in the disks, and from thence through the annular channel-way *c* in such quantities and manner as the circumstances may require.

The suction or receiving chamber B is similar to that shown in a patent granted to us on the 2d day of February, 1875, and is provided with a side opening, J, through which the necessary supply of water is taken in substantially the same manner; and in addition thereto it is constructed with a partition, K, extending entirely across its interior, through which partition a combining-tube, L M, (which is constructed in two sections,) enters said chamber, filling the opening in partition K watertight, so that no packing is required. The section M is bell-mouthed, and is located in the chamber B, and reaches a short distance over the steam-nozzle. At its rear end it screws into section L, which we term a "sliding tube," and it is guided in its movements by the partition K and the cross-partition *l*. Said combining-tube L M is longitudinally adjustable, so as to change the distance between its mouth and the steam-nozzle. As the bell-