

(No Model.)

J. E. HAYES.  
STARCHING MACHINE.

No. 371,263.

Patented Oct. 11, 1887.

Fig. 1.

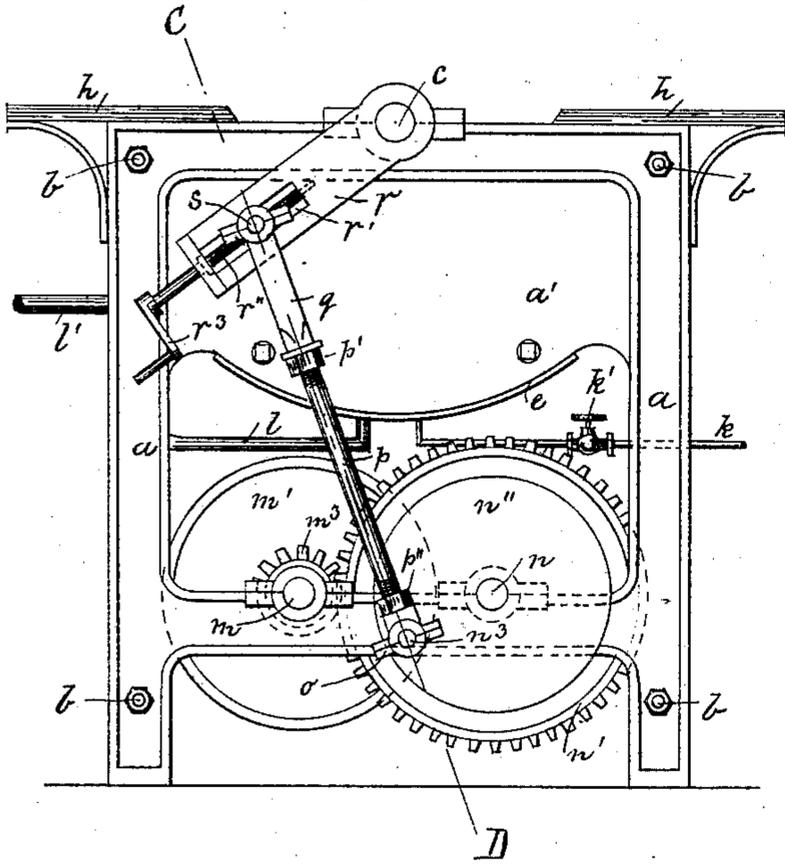


Fig. 2.

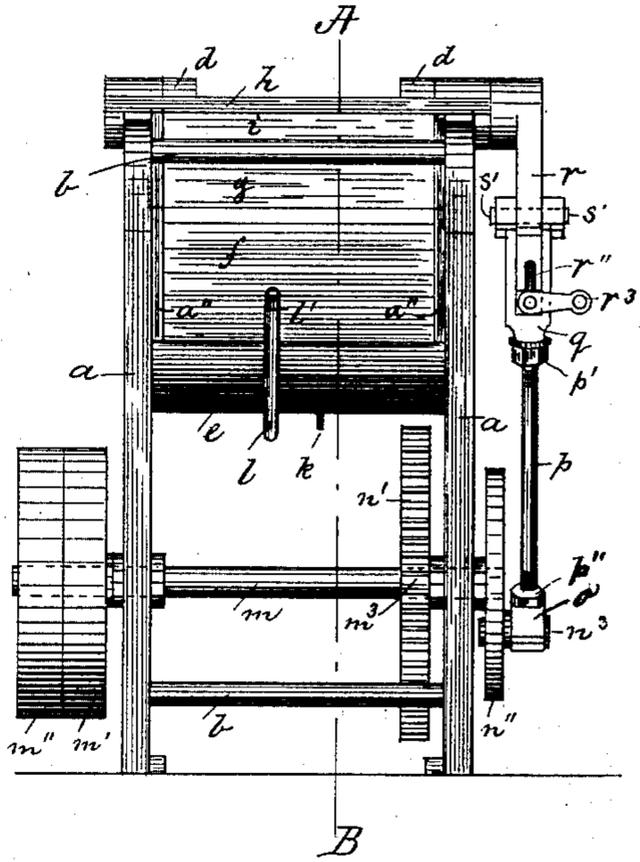


Fig. 3.

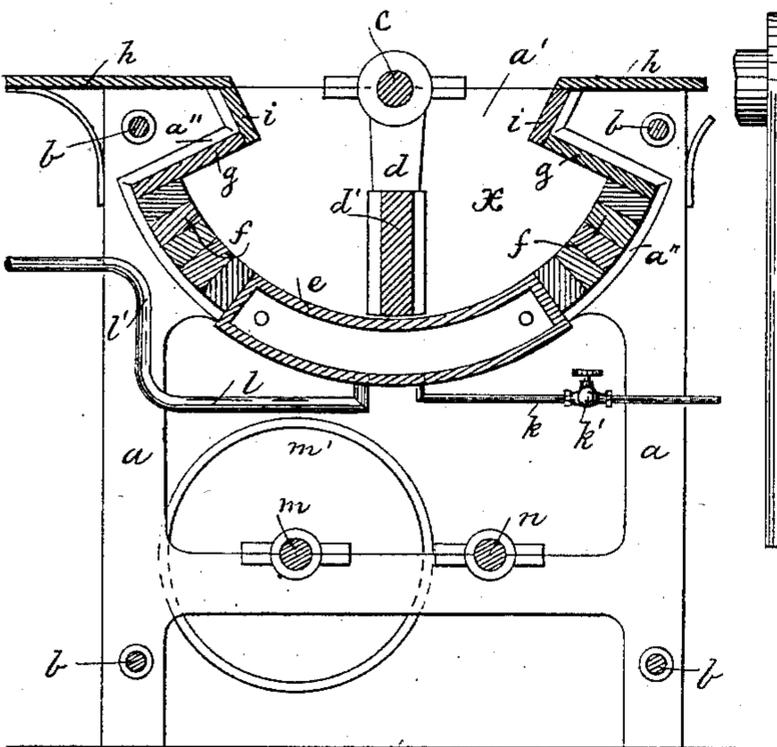
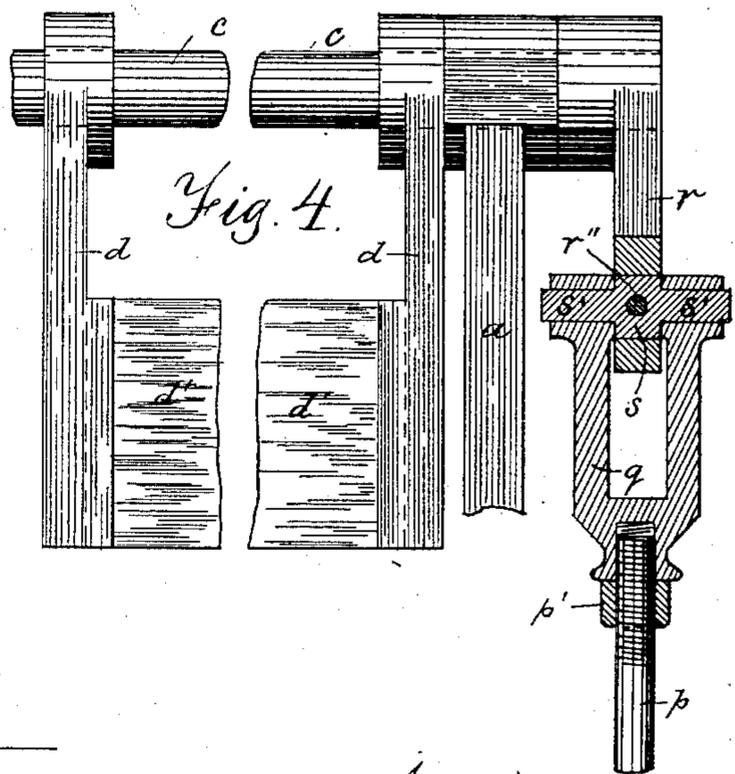


Fig. 4.



Witnesses:  
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by Alban Audren,  
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# UNITED STATES PATENT OFFICE.

JAMES E. HAYES, OF LYNN, MASSACHUSETTS.

## STARCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 371,263, dated October 11, 1887.

Application filed April 18, 1887. Serial No. 235,204. (No model.)

To all whom it may concern:

Be it known that I, JAMES E. HAYES, a citizen of the United States, and a resident of Lynn, in the county of Essex and State of Massachusetts, have invented new and useful Improvements in Starching-Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in machines for starching clothes while in process of being laundered, and it is carried out as follows, reference being had to the accompanying drawings, where—

Figure 1 represents a front elevation of the machine, and Fig. 2 represents an end view of it. Fig. 3 represents a vertical section on the line A B, shown in Fig. 2; and Fig. 4 represents an enlarged detail cross-section on the line C D in Fig. 1, showing the rock-shaft, the plunger-arms, and plunger, as will hereinafter be more fully described.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

*a a* represent the frames, which are secured together at a proper distance apart by means of suitable stays or braces, *b b b b*, as shown in Figs. 1, 2, and 3.

*a' a'* are vertical plates cast in one piece with or secured to the respective frames *a a*, which plates form the sides of the receptacle X, in which the articles are placed while being starched. In bearings in the upper portions of the frames *a a* is located the rock-shaft *c*, to which are secured the plunger-arms *d d*, projecting downward within the receptacle X, and having secured to their lower ends the plunger or cross-bar *d'*, preferably made of wood. (Shown in Figs. 3 and 4.) The bottom of the receptacle X is curved, as shown, the axis of shaft *c* being the center of such curvature.

*e* is a curved hollow water-chamber, containing hot water, so as to keep the starch within the receptacle X at a proper and uniform temperature during the operation of starching the clothes. The hollow water-chamber *e* forms the central portion of the bottom of the receptacle X, and it extends the whole width between the frames *a a*, as shown in Fig. 2. At the ends of the curved water-chamber *e* the curved bottom of the receptacle X is made

of blocks of wood *f f* or analogous material, so as to offer a frictional resistance to the clothes after they have been moved by the plunger *d'* to their highest position in either direction within the receptacle X, and thus to cause the clothes to roll over and over toward the lowest part of the receptacle X when the plunger recedes, and thus preventing said clothes from merely sliding toward the bottom of said receptacle, and by this arrangement the action of the plunger on the clothes is more uniform and causes all parts of said clothes to be evenly and properly starched.

*g g* are the ends or presser-boards of the receptacle X, and they are preferably made of wood or analogous material and secured in a suitable manner to the inside of the frames *a a* or their side plates, *a' a'*, as are also the wood blocks *f f*, there being made on the inside of plates *a' a'* or frames *a a* ribs *a'' a''*, (shown in Figs. 2 and 3,) to prevent the blocks *f f* and boards *g g* from getting out of place.

*h h* are table-tops secured at one or both ends of the upper portion of frames *a a*, as shown in Figs. 1, 2, and 3, which serve the purpose to receive the clothes previous to and after they have been starched.

*i i* are guide-boards extending from the inner edge of each table-top *h* to the inner or upper portion of the presser-board *g*, as shown in Fig. 3.

The water in the hollow curved chamber *e* is kept at a proper temperature by means of the small steam-pipe *k*, leading from any suitable steam-supply, and said pipe is provided with a stop and regulating cock, *k'*, by means of which the steam-supply is regulated or altogether shut off, as may be desired.

*l* is the discharge-pipe, leading from the water-chamber *e*, said pipe having an upwardly-bent branch, *l'*, extending above the highest portion of said water-chamber, as shown in Fig. 3, to prevent the hot water in said chamber *e* from running out of it, by which the chamber *e* would be liable to become overheated by the steam from pipe *k*, and thus cause the starch to be injured or caked.

*m* is the rotary driving-shaft, located in bearings in the frames *a a*, and provided with fast and loose pulleys *m' m''*, and said shaft is set in a rotary motion by belt-power, as usual. To

shaft *m* is secured the pinion *m*<sup>3</sup>, that meshes in the teeth of the gear-wheel *n*<sup>1</sup>, secured to shaft *n*, also located in bearings in frames *a a*, and to the outer end of said shaft *n* is secured the crank-disk or crank *n*<sup>2</sup>, having crank-pin *n*<sup>3</sup> secured to it.

*o* is a bearing or eye journaled on crank-pin *n*<sup>3</sup>, and into its upper end is screwed the lower screw-threaded end of the connecting-rod *p*, the upper end of which is also screw-threaded and screwed into the lower end of the forked piece *q*, as shown in Figs. 1, 2, and 4. The rod *p* is provided with a right-hand screw-thread in one end and a left-hand screw-thread in the opposite end, by which it can be lengthened or shortened, as may be required, to obtain the proper pressure on the plunger, and this is done simply by turning the said rod *p* around its axis, after which it is secured in place to the respective parts *o* and *q* by means of the set-nuts *p*<sup>1</sup> *p*<sup>2</sup>, as shown.

To the outer end of the rock-shaft *c* is secured the lever *r*, the outer end of which is provided with a slot or forked opening, *r*<sup>1</sup>, in which is adjustable, by means of the screw *r*<sup>2</sup> and crank or hand wheel *r*<sup>3</sup>, the block *s*, having pins or trunnions *s*<sup>1</sup> *s*<sup>2</sup>, journaled in the upper end of the forked piece *q*, as shown in Figs. 1, 2, and 4, and by this arrangement the block *s* can be adjusted forward and back in the slot *r*<sup>1</sup>, so as to regulate the pressure of the plunger on the clothes, according to the amount that is put in the receptacle X.

In using the machine a proper amount of

starch is put in liquid form in the receptacle X, and the same is heated to the desired temperature by the hot water in chamber *e*. A suitable number of clothes to be starched are then put in the receptacle X on one or both sides of the plunger *d*<sup>1</sup>, and the latter is caused to oscillate by the connecting mechanism, as described, causing the clothes to be soaked in the starch and to be alternately compressed between the plunger and the stationary presser-boards *g g*, and as the plunger relieves its pressure on the clothes the latter are automatically caused to roll downward into the starch contained in the lower portion of the receptacle X.

The invention may to equal advantage be used as a washing-machine or cleanser, if so desired, without departing from the essence of my invention.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent and claim—

The receptacle X and its oscillating plunger *d*<sup>1</sup>, combined with the curved hollow water-chamber *e*, the curved linings *f f*, and presser-boards *g g* at the ends of the said receptacle, as and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 22d day of March, A. D. 1887.

JAMES E. HAYES.

Witnesses:

ALBAN ANDRÉN,  
EBEN E. SMITH.