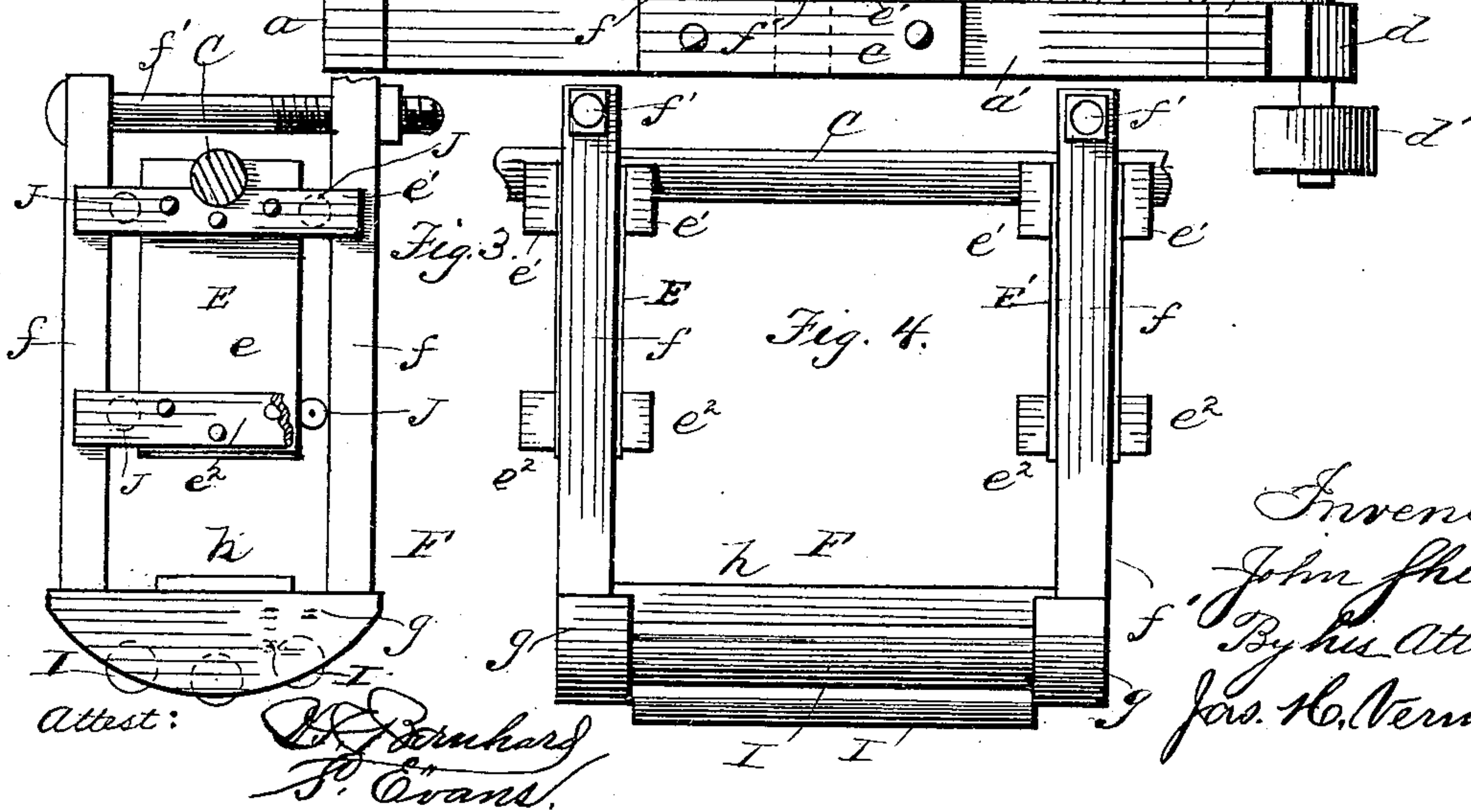
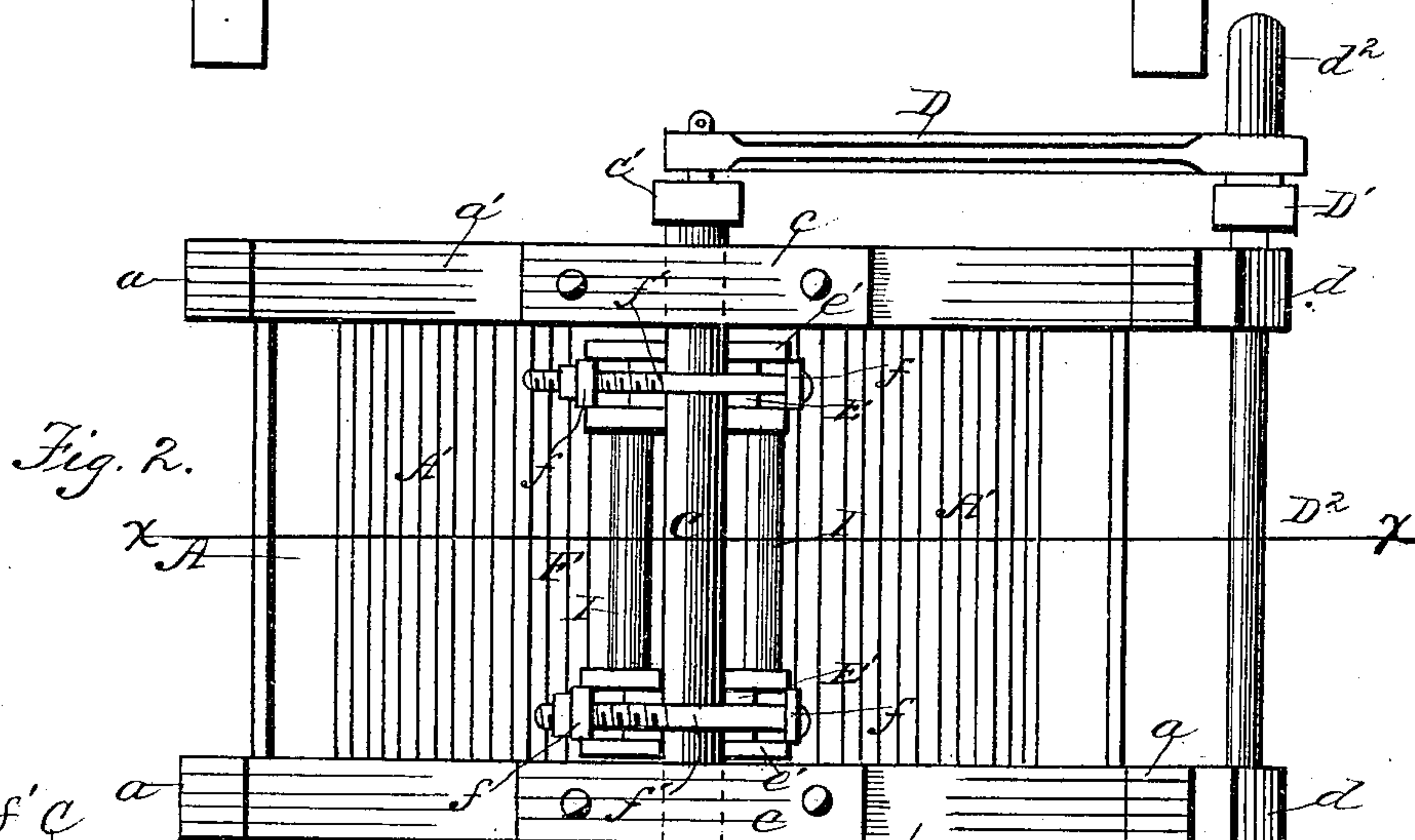
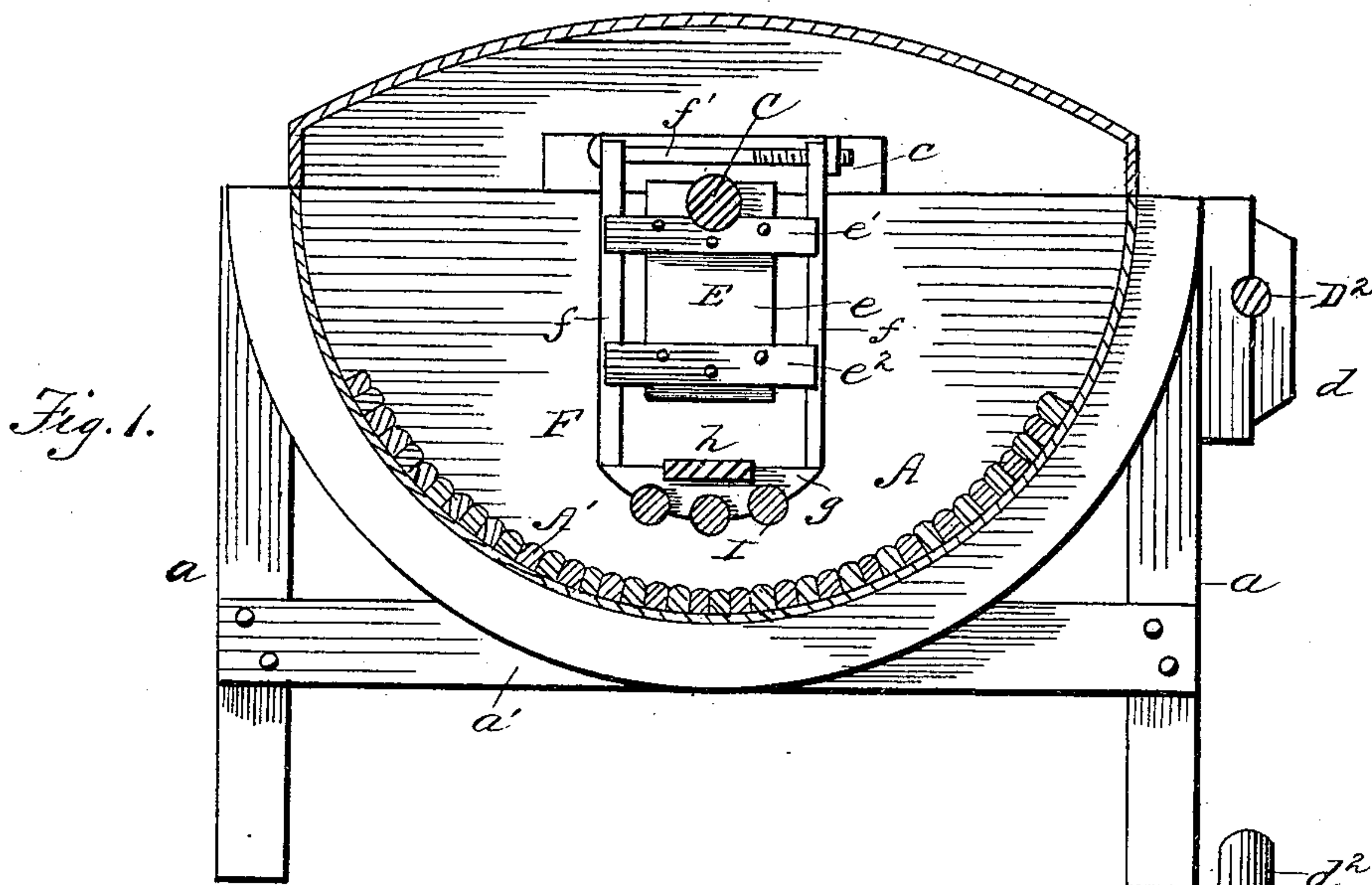


(No Model.)

J. SHILL.
WASHING MACHINE.

No. 377,277.

Patented Jan. 31, 1888.



Attest:

Wm. H. Evans
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UNITED STATES PATENT OFFICE.

JOHN SHILL, OF OMAHA, NEBRASKA.

WASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 377,277, dated January 31, 1888.

Application filed August 24, 1887. Serial No. 247,772. (No model.)

To all whom it may concern:

Be it known that I, JOHN SHILL, of Omaha, county of Douglas, State of Nebraska, have invented new and useful Improvements in Washing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to improvements in washing-machines of the class known to the art as "reciprocating rubber" washing-machines; and it consists of the peculiar combination and construction of devices, that will be hereinafter more fully described, and particularly pointed out in the claims.

The object of my invention is to provide a washing-machine with an improved reciprocating rubber, which is positively driven from a suitable shaft and capable of vertical adjustment while in motion and without any attention on the part of the operator, and thus automatically accommodate itself to the quantity or mass of fabrics in the machine.

A further object of my invention is to provide means whereby the displacement of the rubber on its supports is effectually prevented, and to reduce the friction between the rubber and its supports to a minimum.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional view of a washing-machine embodying my improvements on the line *xx* of Fig. 2. Fig. 2 is a top plan view thereof. Figs. 3 and 4 are detail views of the rubber in end and side elevation.

Referring to the drawings, in which like letters of reference denote corresponding parts in all the figures, A designates the receptacle or suds-box of my improved washing-machine. This suds-box is supported at a suitable height above the ground or floor by means of suitable legs, *a*, which are braced by horizontal rails or bars *a'*, and to these rails or bars and the legs are secured the sides and bottom of the suds-box. The bottom of the suds-box is made concavo-convex in form, and provided on its inner side with a series of slats, *A'*, which are firmly secured in place and have their outer exposed edges curved or inclined to present a corrugated surface to the action of the rubber. If preferred, this corrugated surface to the bottom of the suds-box may be formed in any other desired manner—as, for instance, by sheet

metal. At about midway of the sides of the suds-box I secure suitable bearings, *c*, upon the upper edges thereof, and in these bearings is journaled a counter-shaft, C, one end of which is extended beyond its bearing and provided with a crank, *c'*, to the outer end of which is pivoted a pitman, D, the opposite end of which connects with another crank, D'. This last-mentioned crank D' is secured to a horizontal driving-shaft, D², which is journaled in suitable bearings, *d*, which are fixed to the end of the suds-box. A pulley, *d'*, may be secured on one end of the driving-shaft, over which pulley a belt from a motor or other source of power may be passed to drive the rubber by power, and a handle, *d''*, may also be secured to the crank D' to adapt the machine for use by hand, as will be readily understood.

E E' designate the supports or carriers for the rubber F. These supports or carriers are arranged within the suds-box, near and out of contact with the vertical sides thereof, and each support is fixed in a very secure manner to the counter-shaft to move or swing in unison therewith and with each other when the shaft is oscillated by motion from the driving shaft. Each support or carrier comprises a flat block or plate, *e*, and two pairs of transverse plates, *e'* *e''*, one pair being arranged at the upper end of the block in close proximity to the oscillating counter-shaft, and the other pair being arranged near the lower end of the block, as shown. The plates of each pair are arranged on opposite sides of the block and parallel with each other, and each plate is fixed to the block by means of screws or their equivalents. The ends of each pair of parallel plates are extended beyond the vertical side edges of the blocks to form short projecting ears, between which the vertical arms or standards *f* of the reciprocating rubber F are fitted and guided when the rubber moves or plays vertically in the suds-box to accommodate itself to the mass of fabrics resting on the bottom of the suds-box.

The rubber F of my improved washing-machine has two pairs of parallel vertical arms or standards, *f*, hereinbefore mentioned, which are arranged at opposite sides of the suds-box, one pair to each support or carrier. The arms of each pair are arranged on opposite

sides of the counter-shaft and the carriers, between the ends of the fixed guide-plates thereof. The upper extremities of arms or standards of the rubber are coupled or connected together by means of bolts f' , and the lower ends of the said arms are secured in concave blocks g . These concave blocks g are connected and braced together by a horizontal bar, h , which is arranged across the machine below the carriers and out of contact with the same, and the ends of this bar are firmly united or secured to the blocks in any suitable manner. The blocks and bar $g h$ are arranged a short distance below the lower extremities of the supports $E E'$, to permit the rubber to have a limited vertical play or movement on the supports or carriers independently of the latter, and while the machine is at work.

A series of rollers, I , are loosely journaled in the concave blocks g below the horizontal connecting-bar h , and these rollers act and press upon the fabrics which are placed in the machine on the bottom of the suds-box.

The friction and wear caused by the vertical sliding movement of the standards or arms f of the rubber on the carriers or supports, when the rubber is in use, are reduced to a minimum by means of small friction-rollers J , which are interposed between the sides of the blocks e and the arms f , these friction-rollers being loosely journaled in the extended ends of the parallel plates $e' e''$, as shown.

The operation of my invention will be readily understood from the foregoing description, taken in connection with the drawings.

Power is applied in any suitable manner or from a motor to the driving-shaft to rotate the same and oscillate the counter-shaft through the intermediate connecting-pitman. The carriers, which are fixed to the counter-shaft, swing back and forth with the shaft, and carry with them the rubber, the standards or arms f of which closely embrace the carriers. The rubber is thus swung back and forth in the suds-box to cause the rollers J in the lower end thereof to rub and cleanse the fabrics beneath the same, and at the same time the rubber is free to slide vertically on the carriers $E E'$ for a limited distance to automatically accommodate itself to the quantity of fabrics in the machine.

I do not desire to confine myself to the exact details of construction and form and proportion of parts herein shown and described as an embodiment of my invention, as I am aware that changes can be made therein.

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

1. In a washing-machine, the combination of a horizontal shaft journaled in fixed bearings, depending carriers fixed to the shaft to swing in unison therewith and arranged within the sides of the suds-box, and a vertically-movable rubber connected by devices, substantially as specified, to the carriers to cause said rubber to swing back and forth when the shaft is oscillated, and to permit said rubber to play vertically on the carriers independently of the oscillations of the latter or the shaft, as and for the purposes specified.

2. In a washing-machine, the combination of a horizontal shaft journaled in suitable fixed bearings, a pair of depending carriers fixed to the shaft within the sides of the suds-box, and each having lateral fixed guides, and a vertically-movable rubber having the vertical arms f arranged on opposite sides of the carriers, and between the lateral guides thereof, to thereby adapt the rubber to oscillate with the carriers and shaft, and at the same time permit it to play vertically on the carriers independently of the oscillations of the carriers and shaft, as set forth.

3. In a washing-machine, the combination of a shaft, a pair of carriers having the fixed guide-plates, the ends of which are extended beyond the sides of the carriers, a vertically-movable rubber connected to the carriers to swing with the latter and capable of a sliding movement on the same, and friction-rollers journaled in the extended ends of the guide-plates, and arranged between the carriers and the rubber, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand this 1st day of August, A. D. 1887.

JOHN SHILL.

Witnesses:

ALEX. G. CHARLTON,
JOHN N. FRENZER.