R. KENT.

HYDRAULIC HAT-PRESSING MACHINE.

No. 191,533. Patented June 5, 1877.

Fig. 1.

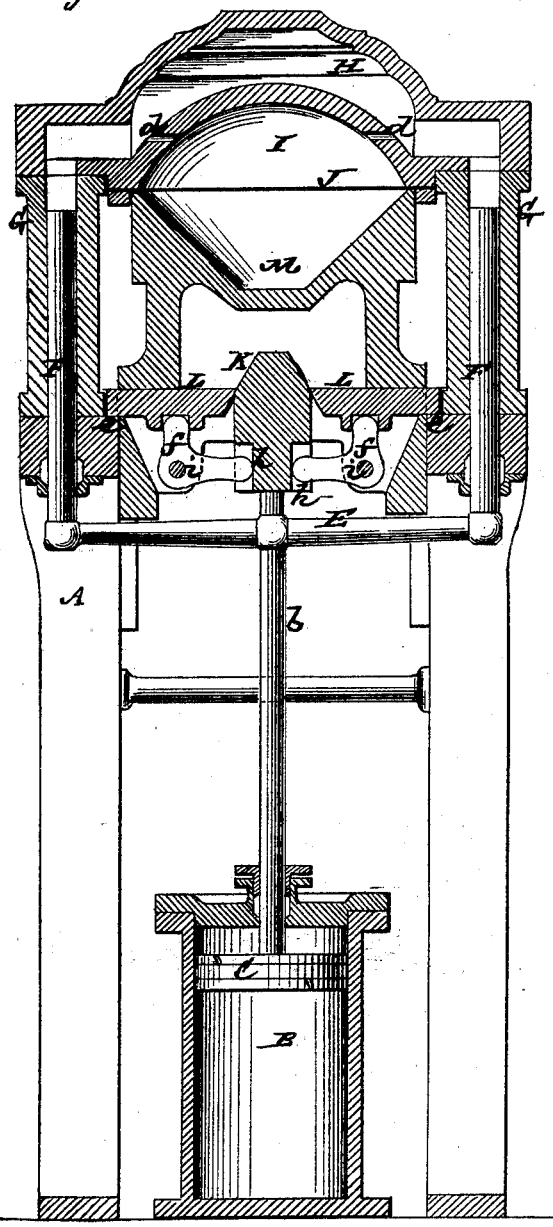
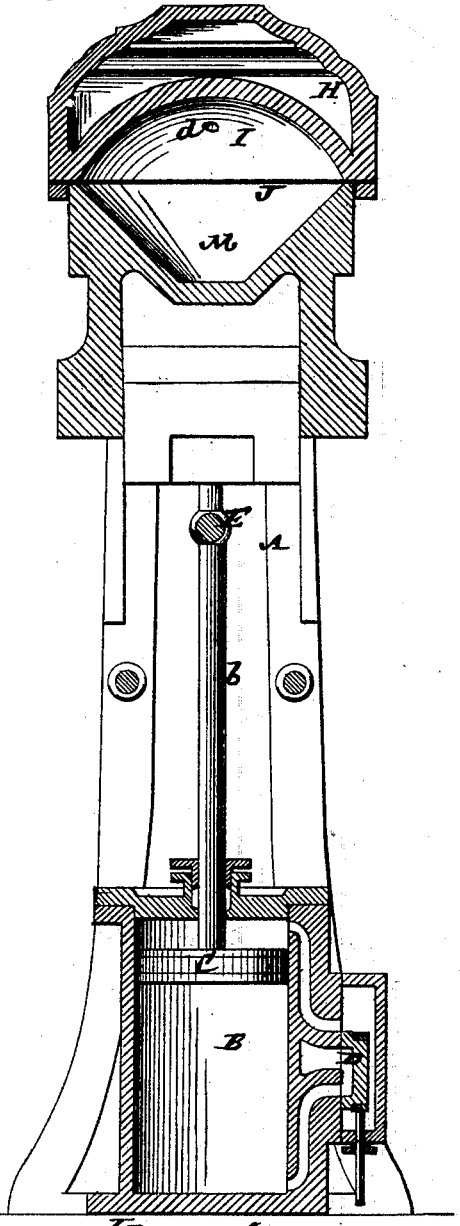


Fig. 2



Witnesses:
Michael Ryan
Geo. Haynes

Inventor,
Robert Kent,
by his Attorneys
Brown & Allen.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ROBERT KENT, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN HYDRAULIC HAT-PRESSING MACHINES.

Specification forming part of Letters Patent No. **191,533**, dated June 5, 1877; application filed April 27, 1876.

To all whom it may concern:

Be it known that I, ROBERT KENT, of the city of Brooklyn, county of Kings and State of New York, have invented certain Improvements in Hydraulic Hat-Pressing Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, which forms part of this specification.

This invention relates to hydraulic hat-pressing machines, applicable also to other purposes, in which steam is employed to work the press or to bring its pressing-surfaces in proper relation with each other, and to put the necessary pressure on the fluid, which, acting on the back of the elastic diaphragm, causes the latter, in conjunction with a mold or block, to give the requisite form to the hat or body under operation.

The invention consists in a novel combination, with a steam-piston and its cylinder, of a mold constructed to serve as a die, or as a seat for a block or die, the same being attached to or carried by the steam-piston, a stationary water or fluid dome, having the elastic diaphragm applied to it, and one or more plungers connected with the steam-piston, the whole being so arranged that one and a continuous motion of the steam-piston in the same direction serves to lift the body to be pressed in or on the mold to its place against the elastic diaphragm, and to force or compress the fluid on the back of the elastic diaphragm to give to the hat or body under operation its required form, and so that a return stroke of the piston reverses such action.

The invention also consists in a novel construction and combination of parts whereby the mold and the dome, with its elastic diaphragm, are automatically locked and unlocked in relation with each other preparatory to and after the application of the hydraulic pressure at the back of the elastic diaphragm by the same and continuous motion of the steam-piston, which lifts and removes the work to and from its place, and which applies and relieves the hydraulic pressure.

By the combination of these several features or elements I produce a hydraulic hat-pressing machine operated by steam, which, when steam is admitted to its actuating-piston, lifts the work to its place against the elastic diaphragm, then automatically locks the work to be pressed, or mold carrying the same, and subsequently gives the necessary hydraulic pressure on the back of the diaphragm, the whole of said operations being performed in a continuous manner and while the steam-piston is moving in the same direction, and so that, on allowing the steam to escape from the working cylinder of the press, the pressure on the work is removed, and the work or mold carrying the same is automatically retired to provide for removal of the pressed work.

A hydraulic hat-pressing machine, thus constructed to operate, does its work in a most expeditious and perfect manner.

In the accompanying drawing, Figures 1 and 2 represent sectional elevations, in planes at right angles with each other, of a hydraulic hat-pressing machine constructed in accordance with my invention.

The frame A of the machine for supporting the working parts may be of any suitable construction. B is the steam-cylinder of the press, and C its operating piston, controlled by a hand-valve, D.

Attached to the piston-rod *b* of the steam-piston C is a cross-head, E, which serves to work two rams or plungers, F F, the barrels or cylinders G G of which are in communication at their tops with a water-reservoir, A, which may be supplied with water in any suitable manner to counteract leakage, and to sustain the necessary pressure, which may be regulated by a gage. This water-reservoir serves to supply the dome I with water, and virtually forms a part of the latter, being in communication therewith by apertures *d*.

J is the elastic diaphragm, secured at its edges to the bottom of the dome I, which is stationary.

Secured to the top of the piston-rod *b* is a wedge, K, on which freely rests, by means of side bolts L L, the mold M. This mold may be constructed as a die for giving the external form to the hat, or it may serve as a seat for a block or die. The side bolts L which, when the mold is fully raised, lock over or rest on shoulders *e e* of the main frame, have connected with them bell-crank levers *f f*, which are

free to play at their lower ends in grooves *h h* up the sides of the straight base portion of the wedge K. These levers have their fulcrums or pivots *i i* attached to the bottom of the mold M.

The operation is as follows: Supposing the steam-piston C to be at the end of its downstroke, then the mold M is also down or away from the dome I, and rests by its bolts L on the inclined surfaces of the wedge K. The machine is then in position for introducing the work, and the valve D is adjusted to let on steam beneath the piston C, which accordingly lifts the mold M, that slides up and down by guides in the main frame, the outer ends of the bolts L also being similarly directed or restrained. As soon, however, as the mold M with the work in or on it is raised up against the dome I the bolts L L, having moved up with the mold, are free to enter notches or pass over the shoulders *e e* on the main frame. The piston C continuing to rise causes the inclined surfaces of the wedge K to force out the bolts L over the projections *e*, and so lock the mold M to its place, after which and during the continued upward movement of the piston, the plungers F, continuing to rise with it, act upon the water in the reservoir H and dome I to expand the elastic diaphragm J, and give the necessary form to the hat in the mold subject to the full or extreme pressure of the steam on the piston C. The valve D is then shifted to exhaust the steam from below the piston C, and, if necessary, to admit steam also above the latter. This causes the piston C, the mold M, and the plungers F to descend and the elastic diaphragm J to resume its normal or contracted condition, thereby fully and conveniently exposing the pressed hat for removal, and putting the machine in position for a fresh pressing operation. In such descent of the piston C the plungers F commence to retire a little in advance of the mold M to more or less relieve the mold of pressure; but as soon as the wedge K in its descent strikes or comes in contact with the bell crank levers *f f* the bolts L L are tripped by said wedge, which thus releases the mold M and causes it to descend in concert with the piston C and plungers F in their continued downstroke or fall, the inner ends of the bolts then resting on the inclined surfaces of the bolt-controlling wedge K, the shape of which provides for the herein-specified action of the bolts. Thus the whole action is positive, quick, and complete in every respect, and the entire operation of the machine, including the locking and unlocking of the mold, is controlled in a continuous manner by the direct motion of a single steam or power piston.

I claim—

1. In a machine for pressing hats, and for similar purposes, the combination of the steam-piston C, having one or more attached water-plungers, F, and mold M with the dome I and elastic diaphragm J, substantially as and for the purposes herein set forth.

2. The combination of a mold-locking device with and subject to the control of the same piston, which, by its continuous motion, controls the position of the mold in its relation with the dome and the hydraulic pressure on the back of the elastic diaphragm, essentially as described.

3. The combination of the inclined or conically-constructed bolt operating and tripping wedge K, the bolts L L, the levers *f f*, the mold M, and the piston C, substantially as and for the purposes herein set forth.

ROBERT KENT.

Witnesses:
HENRY T. BROWN,
MICHAEL RYAN.