F. S. KINNEY.

HYDRAULIC PRESS.

No. 189,630. Patented April 17, 1877.

Fig. 1

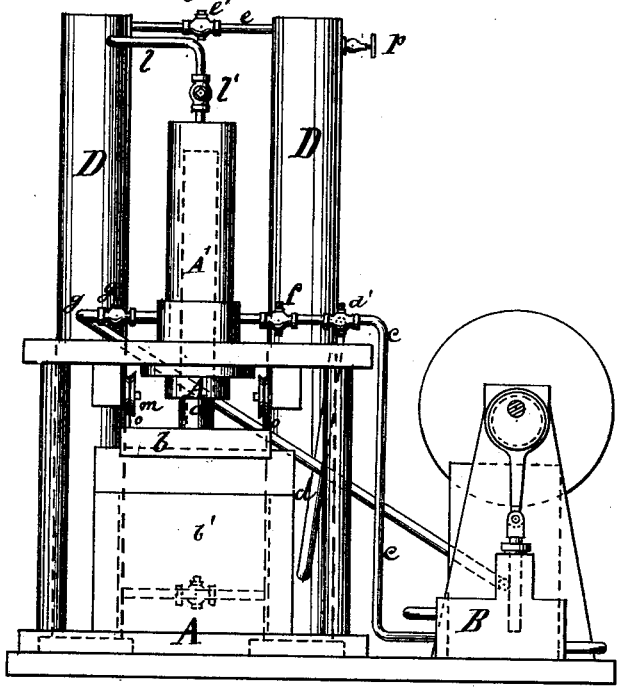
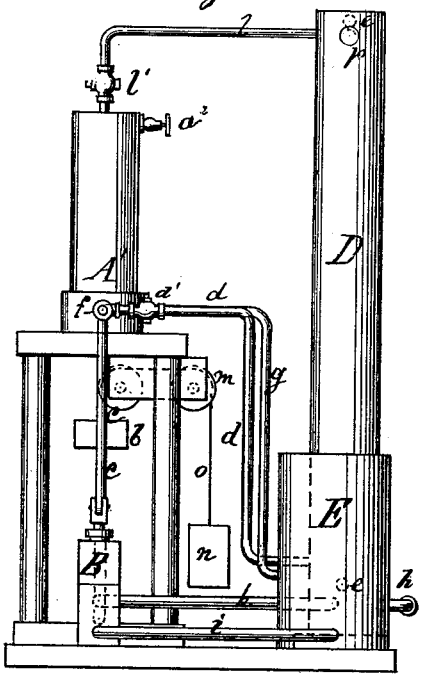


Fig 3



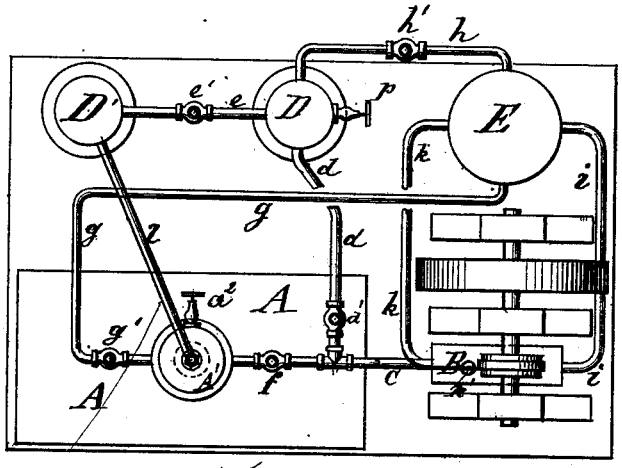


Fig. 2

modification

Witnesses:

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UNITED STATES PATENT OFFICE.

FRANCIS S. KINNEY, OF NEW YORK, N. Y.

IMPROVEMENT IN HYDRAULIC PRESSES.

Specification forming part of Letters Patent No. **189,630**, dated April 17, 1877; application filed February 10, 1877.

To all whom it may concern:

Be it known that I, FRANCIS S. KINNEY, of the city, county, and State of New York, have invented a new and useful Improvement in Hydraulic Press, of which the following is a specification:

Figure 1 is a front view of my improved press. Fig. 2 is a top view of the same. Fig. 3 is a side view of the same.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish an improved hydraulic press, designed especially for pressing tobacco, which may be applied with equal advantage for pressing cotton, hay, and other substances, and which shall be so constructed that the follower may be forced forward to do its work instantaneously, and with any desired force.

The invention will first be described in connection with the drawing, and then pointed out in the claim.

B is a force-pump, which is constructed and driven in the usual way. *i* is the inlet-pipe, through which water is drawn from the tank E. The discharge part of the pump B is also connected with the water-tank E by a pipe, *k*, which, at its pump end, is provided with a safety-valve, *k'*, so that when the resistance reaches a certain point, the said valve may open and allow the water to be forced back into the water-tank E. From the discharge of the pump B a pipe, *c*, leads to the cylinder A', in which the stem *a* of the follower *b* works air and water tight. The pipe *c*, near the cylinder A', is provided with a stop-cock, *f*. From the cylinder A' a pipe, *g*, leads to the water-tank E. The pipe *g* is provided, near the cylinder A', with a stop-cock, *g'*. From the pipe *c*, between the stop-cock *f* and the pump B, a pipe, *d*, leads to a hollow cylinder or magazine, D, which is connected with a similar hollow cylinder, D', at its upper and lower ends, by the pipes *e*. The pipes *e* are provided with stop-cocks *e'*. The cylinder D is provided, at its upper end, with an air-valve, *p*, to admit air when desired, and the pipe *d*, near the pipe *c*, is provided with a stop-cock, *d'*. From the lower part of the hollow cylinder D a pipe, *h*, leads to the water-tank E, which pipe *h* is also provided with a stop-cock, *h'*.

In using the press, the stop-cock *f*, the lower stop-cock *e'*, and the stop-cock *h'*, are closed, and the stop-cock *d'* and the upper stop-cock *e'* are opened. The pump B is then started, and as the water rises in the cylinder D, the air contained in said cylinder is driven into the other cylinder, D'. When the cylinder D is filled with water, the upper stop-cock *e'* and the stop-cock *d'* are closed, and the valve *p* and the stop-cock *h'* are opened, allowing the water in the cylinder D to flow back into the water-tank E, and the cylinder D to be again filled with air. The stop-cocks and valves are then adjusted as first described, and the air in the cylinder D is forced by the water into the second cylinder, D', and so on until the air in the cylinder D' is put under the desired pressure.

When the substance to be pressed has been arranged in the press-box *b'*, the two stop-cocks *e'* and the stop-cocks *f d'* are opened, and the elastic force of the air in the upper parts of the cylinders D D' forces the water in the lower parts of said cylinders into the press-cylinder A', which forces the follower *a b* down into the press-box *b'*, instantaneously compressing the substance that may be in it. The stop-cock *f* is then closed, the stop-cock *g'* and the valve a^2 are opened, and the water in the press-cylinder A' is allowed to flow back into the water-tank E. As the water flows out of the press-cylinder A', the follower *a b* is raised by the counterbalancing weight *n*, which is connected with said follower *b* by the cords *o*, which pass over the pulleys *m*, pivoted to the frame of the press.

One of the hollow cylinders, as D, may be omitted, by connecting the upper end of the other cylinder, D', with the upper end of the press-cylinder A' by a pipe, *l*, provided with stop-cock *l'*, and using the cylinders A' D' to compress the air, as hereinbefore described with reference to the cylinders D D'. I prefer the construction first described, as it enables the follower *a b* to be raised and the press-box *b'* supplied with another charge while the air is being again put under the required pressure. In this way the same air

and the same water are used continuously, and all the pump has to do between two operations of the press is to restore the water used in forcing down the follower, and thus bring the air to its former state of compression.

It will here be observed that the pump B works continuously, the water passing back to the tank E through the pipe *k*, when it cannot pass through the pipe *c*.

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

In a hydraulic press, the combination of the force-pump B, the two magazines D D′, and the tank E, connected by valved pipes having stop-cocks, to cause an air-pressure in the magazine D′, as specified.

FRANCIS S. KINNEY.

Witnesses:
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C. SEDGWICK.