D. C. STARKS.

Pump for Hydraulic-Presses.

No. 162,256. Patented April 20, 1875.

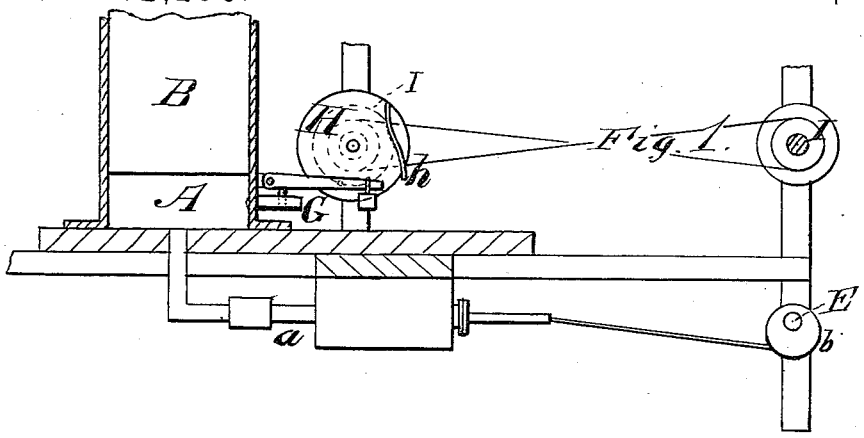
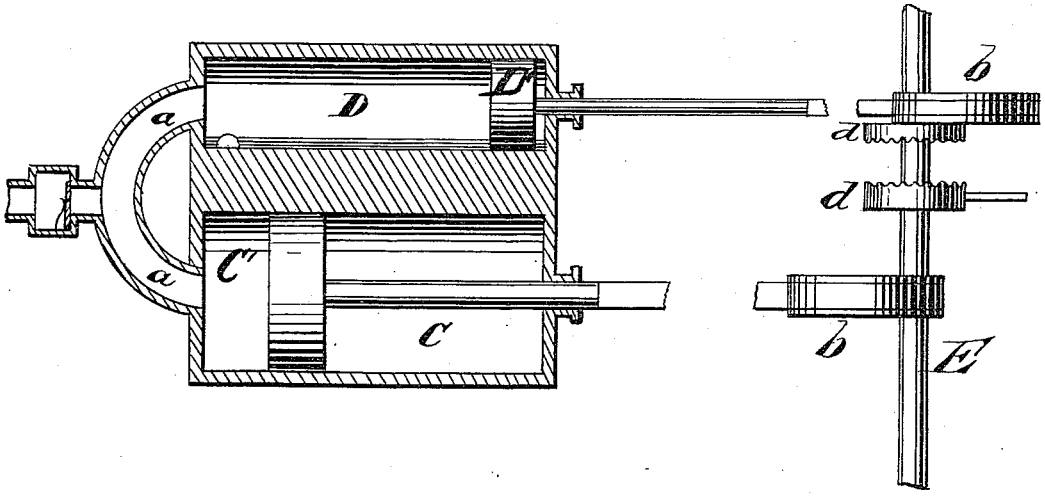


Fig. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

DANIEL C. STARKS, OF HERMITAGE, NEW YORK.

IMPROVEMENT IN PUMPS FOR HYDRAULIC PRESSES.

Specification forming part of Letters Patent No. **162,256**, dated April 20, 1875; application filed March 10, 1875.

To all whom it may concern:

Be it known that I, DANIEL C. STARKS, of Hermitage, in the county of Wyoming and State of New York, have invented certain new and useful Improvements in Hydraulics; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification:

The nature of my invention consists in the construction and arrangement of a hydraulic pump, to be used for any purpose desired, where applicable, as will be hereinafter more fully set forth.

In the annexed drawing, Figure 1 is a vertical section, showing the power as applied to cider-presses. Fig. 2 is a horizontal sectional view.

A represents a cylinder of any suitable dimensions, provided with a piston, B, worked by hydraulic pressure, obtained by a single or double plunger force-pump. The cylinder of the pump is formed with two barrels, C and D, or in other words, two cylinders are used, which are placed parallel with each other and containing respectively the plungers C′ and D′. The barrels or cylinders C D are connected by pipes *a a* with the cylinder A, as shown. The plungers C′ D′ are connected to and operated by two cams, *b b*, on a driving-shaft, E, which is to be kept in motion by any suitable or convenient power. The cylinders C D, as well as their respective plungers, are of unequal diameter. The larger plunger C′ is kept in operation, and, as it advances, forcing the water before it into the cylinder A, and slowly raising the piston B therein. Just before this plunger completes its forward movement, at about the point as shown in Fig. 2 of the drawing, the smaller plunger D′ is thrown in gear by a clutch, *d*, operated by any suitable mechanical means, and the cam operating said smaller plunger being properly constructed, this plunger will give a forcible final thrust, moving rapidly the entire length of the cylinder D, while the larger plunger C′ at the same time completes its stroke, thus pressing the piston B up to the desired point. The clutch *d* should be so arranged and connected with the piston B, or the mechanism operated thereby, that when the piston obtains a certain altitude by the operation of the two plungers the clutch will be thrown out of gear. The hydraulic pump is controlled by means of a safety-valve, G, so arranged as to blow off at any desired pressure. This pressure is retained for any desired length of time, according to the movement of a face-plate, H, with cam *h* attached to it, and said face-plate operated by cone-pulleys I I, with belt around them, driven by gear from the main shaft E. These pulleys and face-plate are arranged on suitable counter shafts, arranged in any convenient manner in the frame of the pump.

I am aware that a hydraulic press having two plungers of unequal size to operate alternately at different times in the process of pressing, by the shifting of a belt from one pulley to another, is not new, and I do, therefore, not claim such as my invention. It will be seen that in my pump the large plunger operates first alone to a certain point within its cylinder, and then the smaller plunger is automatically thrown in gear, so that while the larger plunger completes its stroke the smaller one is at the same time rapidly moved the entire length of its cylinder to give the final forcible thrust.

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

1. In a hydraulic pump, the combination of two plungers, C′ D′, of unequal size, the operating cams *b b*, and the automatically-operating clutch *d*, whereby the smaller plunger is thrown in gear before the larger plunger has completed its stroke, and both plungers then operate together at unequal speed to complete the movement, substantially as herein set forth.

2. The combination, with the cylinder A, of the safety-valve G, face-plate H, with cam *h*, and cone-pulleys I I, with their connecting-belt run by gearing from the main shaft, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

DANIEL C. STARKS.

Witnesses:

JAMES L. BLODGET,

S. A. FARMAN.