

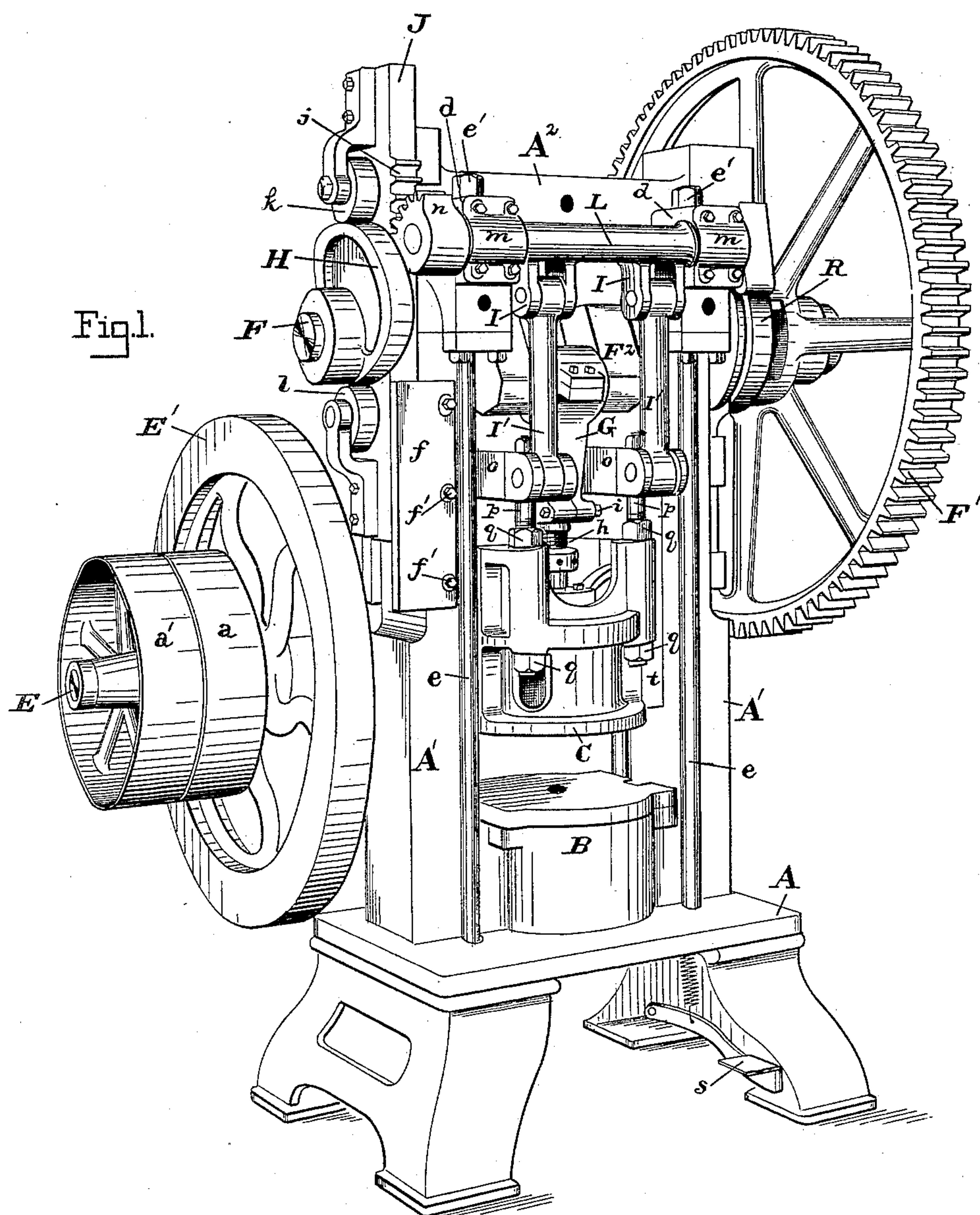
(No Model.)

3 Sheets—Sheet 1.

J. S. DETRICK.
SHEET METAL DRAWING PRESS.

No. 462,628.

Patented Nov. 3, 1891.



WITNESSES:

Edward A. Osse,
J. P. Davis.

INVENTOR:

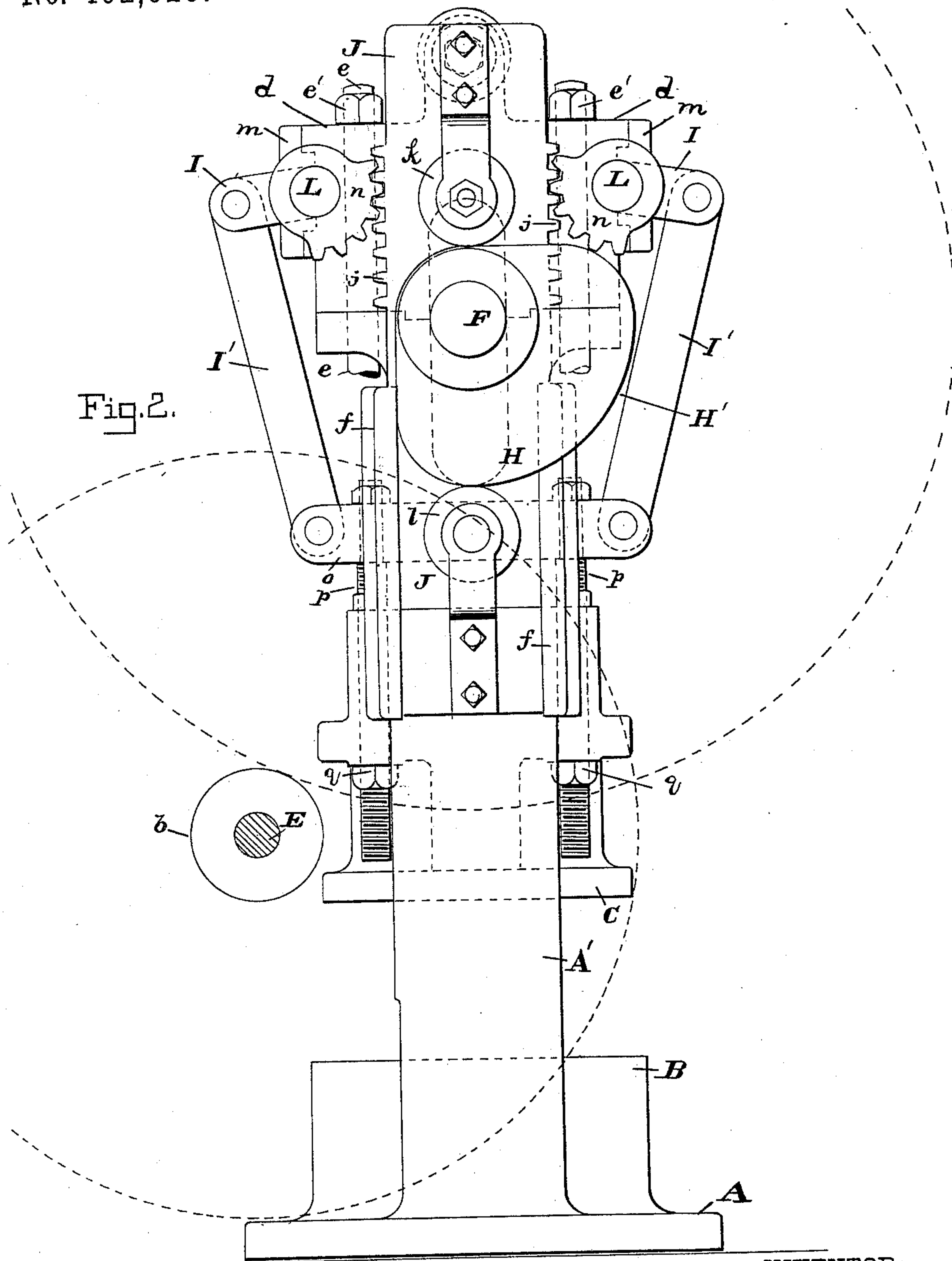
Jacob S. Detrick

BY Chas B. Mann
ATTORNEY.

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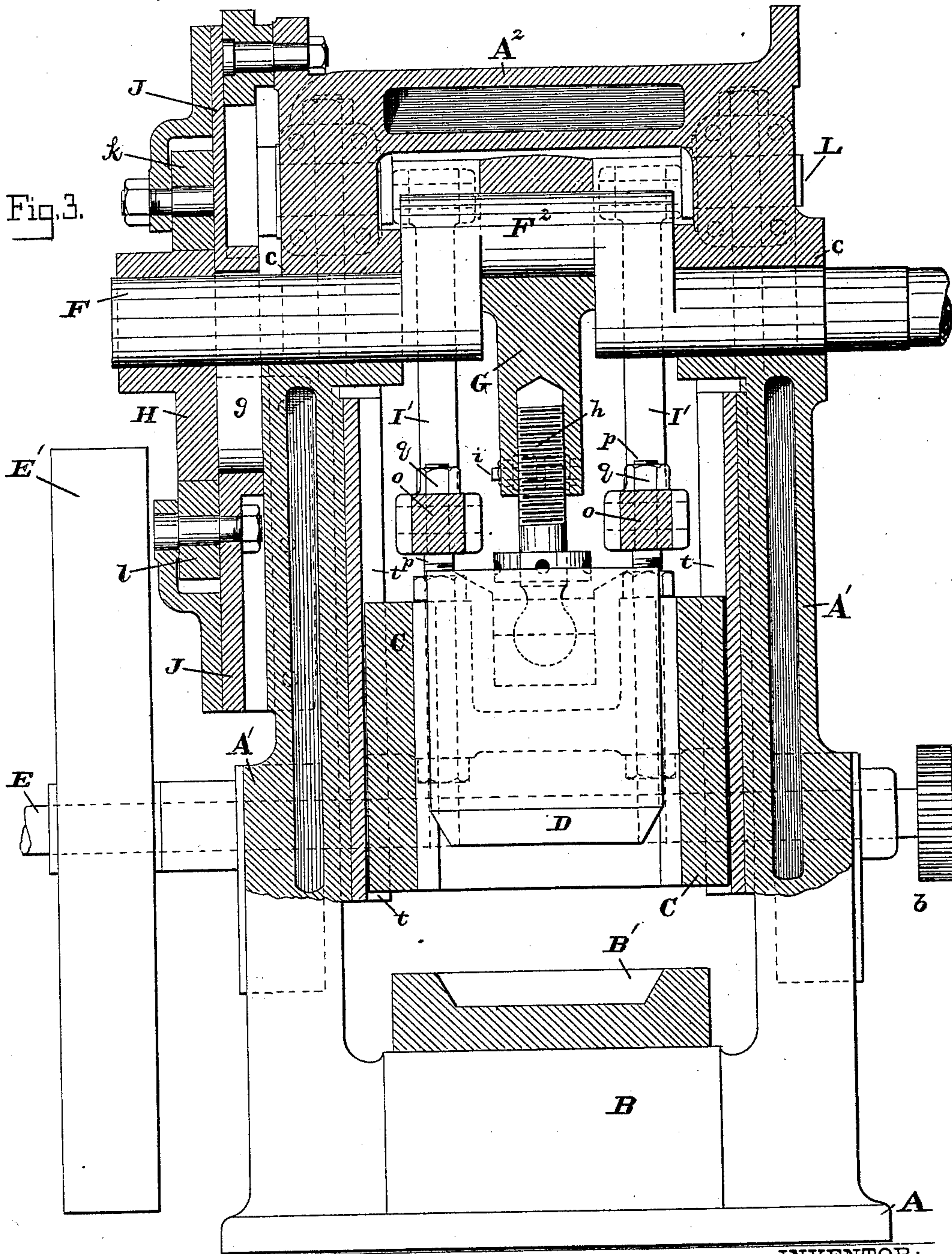
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UNITED STATES PATENT OFFICE.

JACOB S. DETRICK, OF BALTIMORE, MARYLAND.

SHEET-METAL-DRAWING PRESS.

SPECIFICATION forming part of Letters Patent No. 462,628, dated November 3, 1891.

Application filed February 7, 1891. Serial No. 380,574. (No model.)

To all whom it may concern:

Be it known that I, JACOB S. DETRICK, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Sheet-Metal-Drawing Presses, of which the following is a specification.

This invention relates to an improved drawing-press for producing sheet-metal pans, kettles, and like articles.

The object of the invention is to provide an improved construction and combination of parts where a toggle-joint is employed to operate the blank-holding device, while other mechanism operates the die-plunger. This kind of a press is known as a "double-action" press.

The drawings illustrate the invention.

Figure 1 is a perspective view of the press. Fig. 2 is a side elevation of part of the press. Fig. 3 is a vertical section of the press.

Referring to the drawings, A designates the base of the machine; A', the standards of the frame; B, the die-bed; B', the die; C, the blank-holder, which is hollow or cylindrical; D, the die-plunger, which works up and down through the blank-holder; E, the main drive-shaft; and F, the crank-shaft. All of these parts are of ordinary or suitable construction.

The main shaft E at one end carries a fly-wheel E' and fast and loose pulleys a a'. At the other end this shaft carries a pinion b, which gears with the wheel F' on the crank-shaft F. A pitman G connects the crank F' with the holder of the die-plunger D. The latter is therefore worked up and down direct from the said crank. The pitman is adjustable in length, being made in two parts. One part h is a screw which telescopes within the other part. This latter part has a split and also tightening-screws i, which draw the two sides of the split together and thus bind or grip the screw h.

The crank-shaft F has rigidly attached at one end a cam H, which, through the agency of suitable mechanism, imparts motion to the toggle-links II', by means of which the blank-holder C is raised and lowered between vertical guides t.

One feature of my invention consists in the combination of the cam H, the toggle-links,

and the mechanism here shown connecting them, whereby the revolution of the cam imparts motion to the toggle-links.

It also consists of the particular features of construction hereinafter pointed out in the claims. Each side standard A' has its upper end terminating where the bearings or boxes c are located for the crank-shaft F, a top cross-beam A² rests on the two side standards, and the upper half of the said crank-shaft boxes are formed therein. Thus the crank-shaft F may be placed in the boxes on the side standards and then the top cross-beam A² set in position. The top cross-beam has four lateral projections d, which are cast integral with it, and said top beam is confined to its position on the standards by four vertical bolts e, one being through each lateral projection d. These bolts pass down alongside of the standards and through the base A of the machine. It will be seen that by removing the bolt-nuts e' the top beam A² may be lifted off, and then the crank-shaft and other parts may readily be removed.

A vertically-reciprocating rack-bar J is secured in a slideway f on one of the side standards of the machine. The slideway in the present instance is formed by two plates f, secured at opposite sides of the standard A' by bolts f'. In Figs. 2 and 3 the bar is down. The movable rack-bar has teeth j on opposite edges and a slot g extending vertically, and the crank-shaft F takes through this slot. Two rollers k l are carried on the outer side of the rack-bar, one being above and the other below the slot g, and the cam H on the crank-shaft has position between these two rollers and is in contact with both, so that the revolution of the cam imparts an up-and-down movement to the rack-bar J. The cam H is the shape of the quadrant (see Fig. 2)—that is, its working face H' is concentric with the axis of the crank-shaft F, and said face is about ninety degrees of a circle. When this face of the cam is bearing on either of the two rollers l k the rack-bar J will be either down or up, according to which roller the cam is in contact with, and the rack-bar, while in either the down or up position, will pause or remain stationary while the said cam-face H' is moving in contact with the roller.

Two rock-shafts L are mounted in bearings *m* on opposite sides near the top of the frame. Each rock-shaft has a segment-gear *n*, which engages the teeth *j* on the rack-bar. Thus as
 5 the said bar moves up and down it imparts a rocking movement to the two shafts L. Each rock-shaft has the short arms I of two toggles, the long arms I' of which are suitably connected with the blank-holder C. In the
 10 present instance the said long arms attach to cross-bars *o*, and adjusting-screws *p* and nuts *q* are employed to connect the cross-bars with the blank-holder C. This adjustable connection between the toggle-links and blank-
 15 holder enables the effective stroke of said holder to be regulated.

The gear-wheel F' is made rigid on the crank-shaft F by a clutch device R of any well-known kind, which engages for one complete
 20 revolution on the depression of a treadle *s* and then stops automatically. As this device forms no part of my present invention the details of its construction are not shown.

The operation of the machine will be readily understood. Normally when at rest the blank-holder C and the die-plunger D will be
 25 up, as in Fig. 3. By the revolution of the crank-shaft F the cam H will act on the upper roller *k* of the rack-bar J, and by raising
 30 said bar will cause the segment-gear *n* to turn the rock-shafts L, and thereby the toggles I I' will force down the blank-holder C and confine the sheet-metal blank on the die B'. At this time the crank F² will begin its descent and the pitman G will carry down the
 35 die-plunger D. Thus the mechanism described produces the desired relative motions of the blank-holder and die-plunger.

Having described my invention, I claim—

1. In a double-action press, the combination 40 of standards with vertical guide, a blank-holder, a die-plunger, a shaft having a crank suitably connected with the die-plunger, a quadrant-shaped cam H, mounted on the crank-shaft, a vertically-movable rack-bar 45 having two rollers *k l*, one above and the other below the cam and both in contact therewith, a rock-shaft in gear with said rack-bar, and toggle-links connecting the rock-shaft and blank-holder. 50

2. In a double-action press, the combination of standards with a vertical guide, a blank-holder, toggle-links connected with the said blank-holder, a die-plunger, a shaft having a crank suitably connected with the die-plun- 55 ger, a cam mounted on and revoluble with the shaft, and a reciprocating rack-bar moved by the cam for operating the toggle-links.

3. In a double-action press, the combination of standards with a vertical guide, a blank- 60 holder, toggle-links connected with the said blank-holder, a die-plunger, a shaft having a crank suitably connected with the die-plunger, a reciprocating rack-bar having teeth on opposite edges and provided with a slot 65 through which the said crank-shaft turns, two rock-shafts, each being in gear with a different set of teeth on the rack-bar and connected with an arm of the toggle-links, and a revoluble cam to move the said rack-bar. 70

In testimony whereof I affix my signature in the presence of two witnesses.

JACOB S. DETRICK.

Witnesses:

A. O. BABENDREIER,
 F. P. DAVIS.