

W. KLOCKE.

DRAWING PRESS.

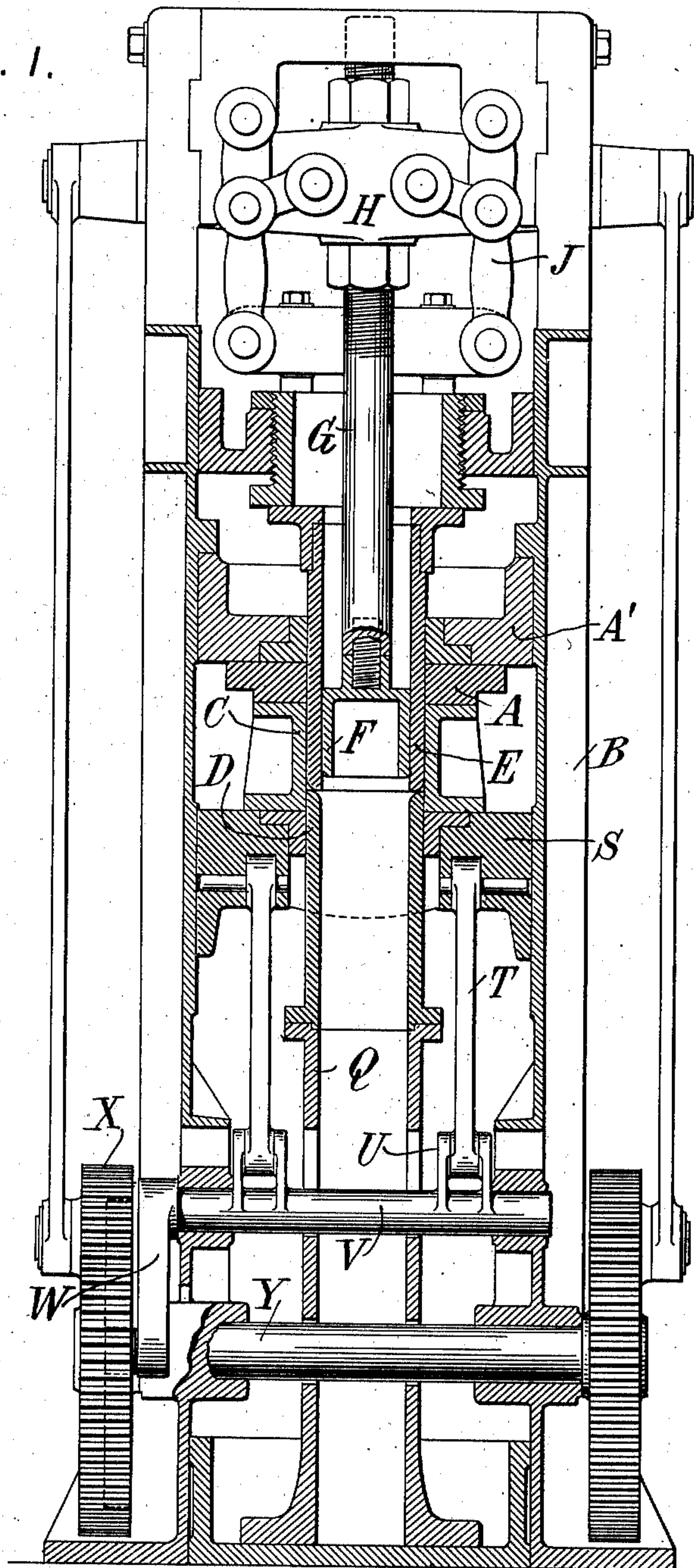
APPLICATION FILED JULY 29, 1909.

967,022.

Patented Aug. 9, 1910.

3 SHEETS—SHEET 1.

FIG. 1.



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3 SHEETS—SHEET 2.

FIG. 2.

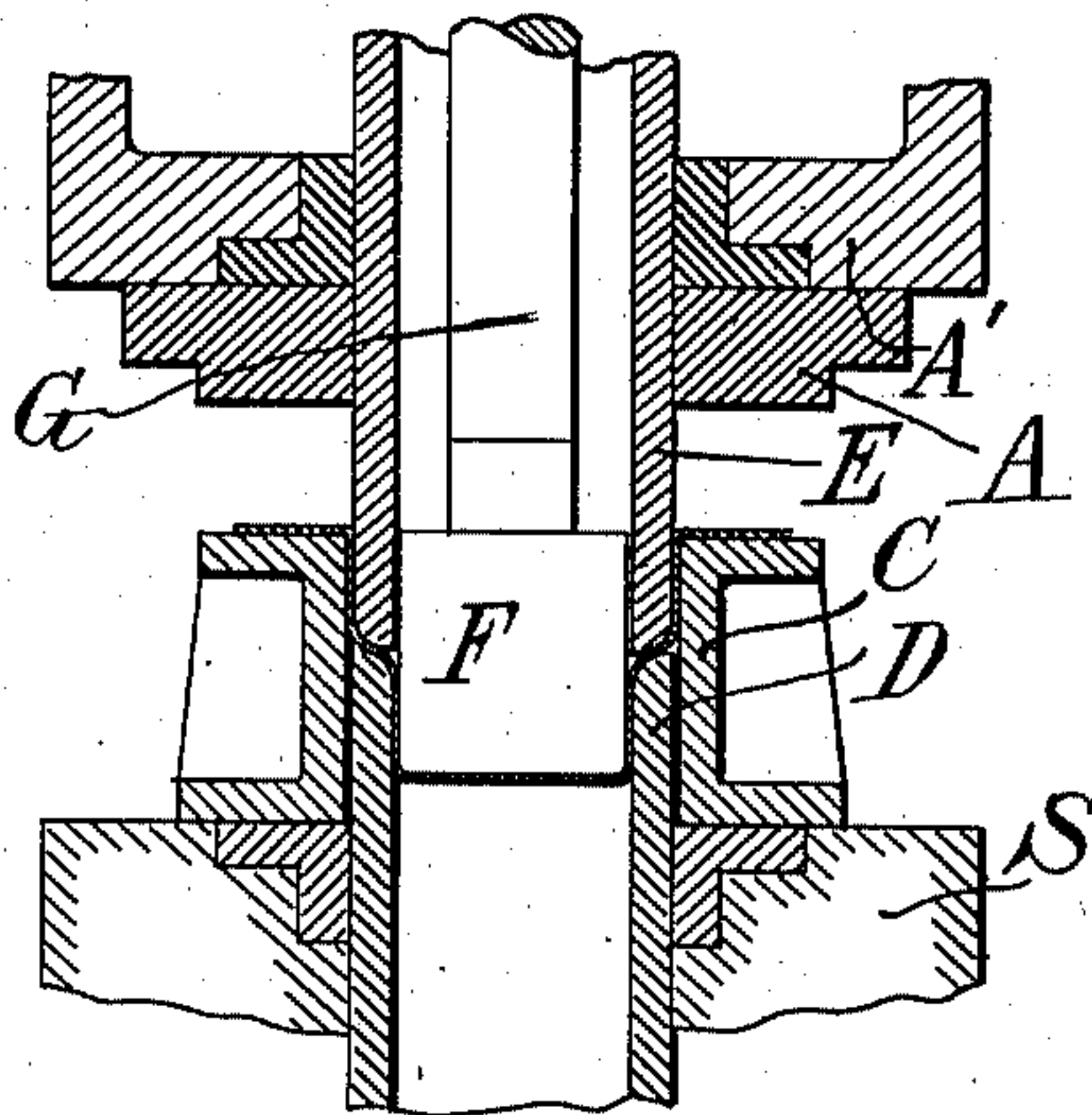


FIG. 3.



FIG. 4.

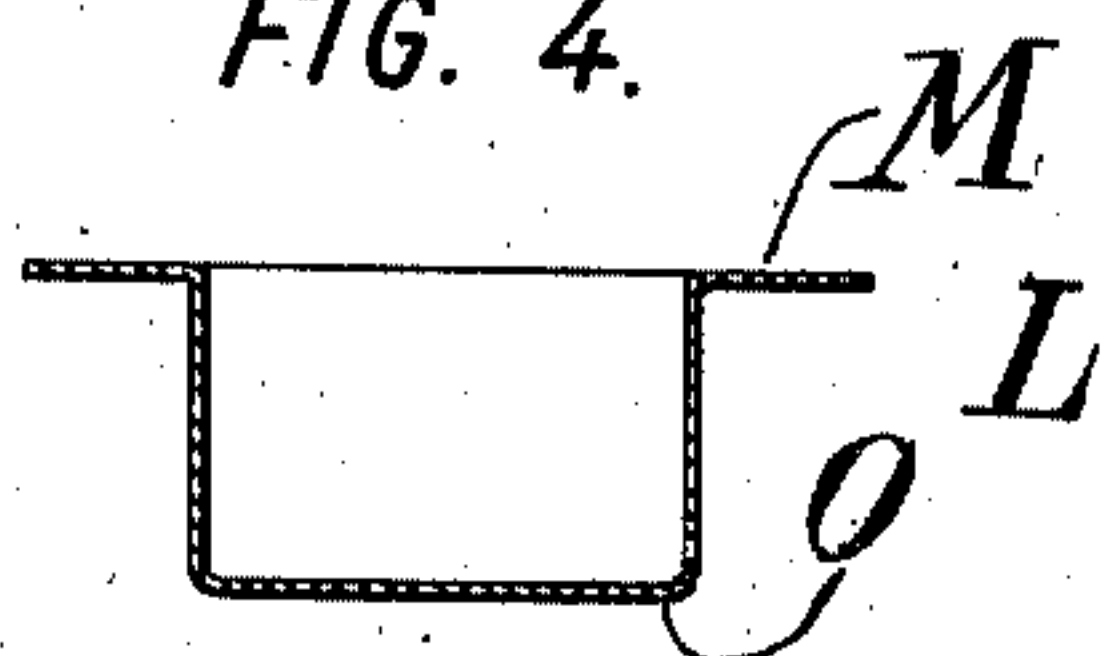
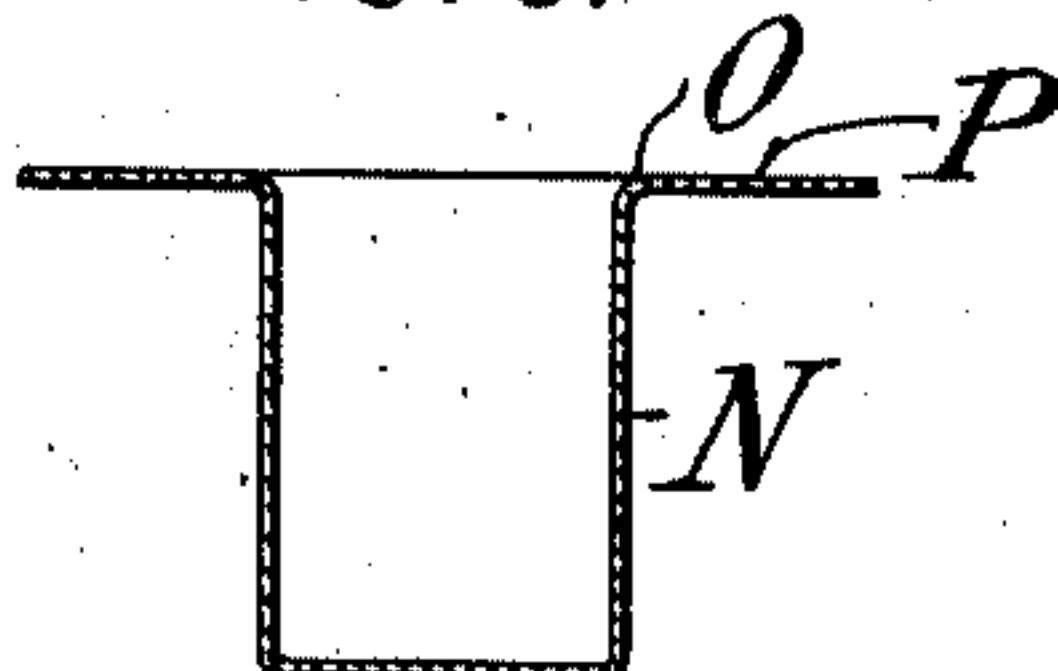


FIG. 5.



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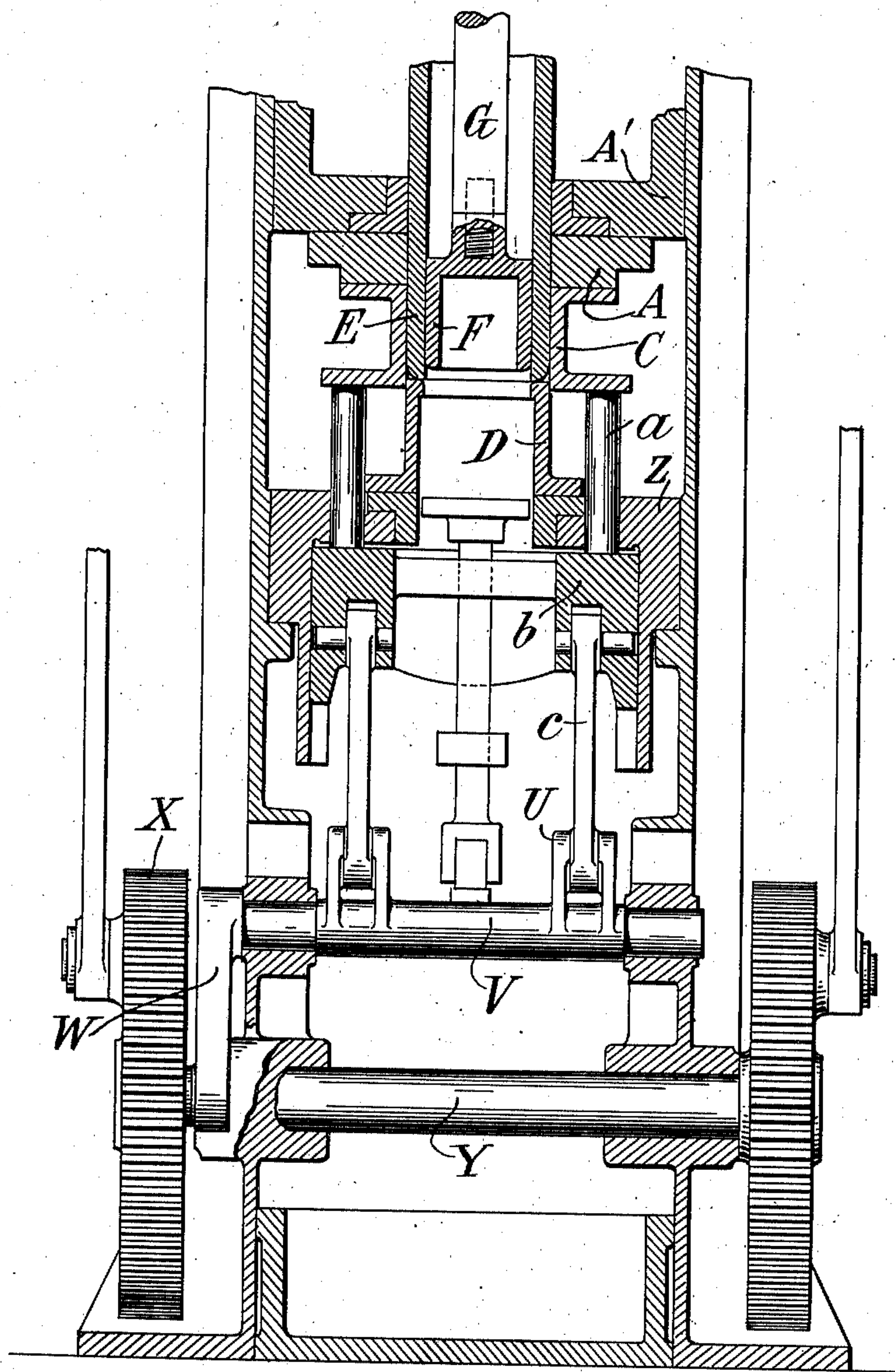
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3 SHEETS—SHEET 3.

FIG. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM KLOCKE, OF NEW YORK, N. Y., ASSIGNOR TO E. W. BLISS COMPANY, OF
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DRAWING-PRESS.

967,022.

Specification of Letters Patent.

Patented Aug. 9, 1910.

Application filed July 29, 1909. Serial No. 510,239.

To all whom it may concern:

Be it known that I, WILLIAM KLOCKE, a citizen of the United States, residing in the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Drawing-Presses, of which the following is a specification.

The invention aims to provide improvements in drawing presses to adapt them specially for drawing work with wide flanges, and for other purposes. For this purpose the press has dies in which successive drawing operations are performed on the work, one of the dies being movable relatively to another after the performance of a drawing operation with the first.

Other points of improvement are referred to in detail hereinafter.

The accompanying drawings illustrate machines embodying the invention.

Figure 1 is partly an elevation and partly a section of a double drawing press embodying the invention; Fig. 2 is a similar view of dies and punches of the same press in a later position; Figs. 3, 4 and 5 are sectional views of the work in successive stages; Fig. 6 is a vertical sectional view of the principal parts of another machine embodying the invention.

Referring to the embodiments of the invention illustrated, the machine carries an upper fixed blank holder A on the lower face of a slide A' between the side frames B; and a first larger die C and second smaller die D. The first or outer punch E and the second or inner punch F are reciprocated, the latter by means of a connecting rod G and a cross head H, and the former by means of toggle mechanism J connected to the cross head H so as to communicate to the first punch the first movement of the cross head, and to hold the first punch steady during the continued movement of the cross head and the second drawing operation. This mechanism for contributing the necessary movement to the punches, may be similar to that described in my previous application Serial No. 424,315, filed March 31, 1908, and need not be referred to here in detail.

The flat sheet or blank K (Fig. 3) is first gripped between the fixed blank holder A and the upper face of the first die C. The outer punch E then advances (the inner

punch being slightly retracted within the outer one as shown in Fig. 1) and draws the tube L with the flanges M as shown in Fig. 4. In this first drawing operation it is not possible to use a blank of such large dimensions as to give a wide flange at M, without producing an excessive crinkling in drawing the blank down to the smaller diameter necessary, and destroying the blank in many cases. I propose therefore after forming the first flange M, to add to its width by an extension inward, using a second drawing operation for the purpose.

At the lowest point of movement of the outer punch E it grips the margin of the bottom of the tube L upon the second die D, and this punch and die serve as blank holders for the second operation. The inner punch F draws the tube to a smaller diameter, as shown at N (Fig. 5). All portions of the blank in passing from the shape of the tube L to that of the tube N, are first reformed into approximately their original flat condition as a ring O between the large tube formed by the first draw and the smaller tube in process of formation; and it is this ring O which is applied to the inner edge of the first flange M to increase its width. This result is effected preferably by bringing down the first die C just before or during the second drawing operation, so as to avoid the drawing of the flange M into a cylindrical shape. Fig. 2 shows the relative positions of the dies and punches during the second drawing operation. In its final position the upper face of the first die C rests substantially parallel with the upper face of the second die D, so that the flange M and the ring O are merged into a single wide flange P (Fig. 5).

Various arrangements of the dies and punches and of the mechanisms for actuating and supporting them, may be provided for securing the desired result. The preferable way is to withdraw the first die C after its use in the first drawing operation, and the withdrawal is preferably effected vertically, the blank holder A and the lower die D being fixed and the punches being movable in the ordinary way; thus involving very little departure from the design of punches now in general use.

In Fig. 1 the inner die D is removably mounted directly on a column Q extending to the base of the machine. Dies of various

designs may be substituted for each other readily upon the top of the column. The outer die C is mounted upon a bed S which is arranged to slide in guides upon the side frames of the machine, and which fits with a good sliding fit about the second die D. The bed is reciprocated at proper intervals by means of links T connected at their lower ends to arms U on a shaft V which is provided at one end with an arm W carrying a roller which projects into a cam-groove in the gear X upon the main shaft Y of the machine.

Fig. 6 illustrates a slightly different construction. The upper blank holder A and the outer and inner punches E and F are the same as in Fig. 1. The second die D, however, is supported upon the fixed bed Z, and the first die C is supported upon rods *a* which pass through the bed Z and are mounted at their lower ends upon a slide *b* sliding upon suitable guides on the lower part of the bed Z. The slide *b* is given the necessary vertical movement through links *c* connected to the arm U on the shaft V which, as in the mechanism of Fig. 1, is oscillated by means of an arm W having a roller at its end running in a cam-groove in the inner face of the gear X.

What I claim is:—

1. A drawing press having dies in which successive drawing operations are performed on each piece of work, means for holding the first one of said dies in clamping position during the first drawing operation and for removing it therefrom during the next operation.

2. A drawing press having dies in which successive drawing operations are performed on each piece of work, the second of said dies having its upper end within the lower end of the first, a blank holder between which and the upper end of the first die the blank is held and an outer flange may be formed, an outer punch fitting the first die and between which and the upper end of the second die the once-drawn work is held and an inner flange may be formed, an

inner punch fitting the second die, the first die being movable relatively to the blank holder after the first drawing operation to permit the bringing of the outer one of said flanges toward the inner one in the second drawing operation.

3. A drawing press having dies in which successive drawing operations are performed on each piece of work, a fixed blank holder and punches corresponding respectively with said dies, means for moving the first one of said dies to clamp a blank between itself and the blank holder and for holding said die in said position during the first drawing operation and withdrawing it during the next drawing operation.

4. A drawing press having a pair of dies C and D and a pair of punches E and F corresponding thereto, means for holding said dies in position to effect a first drawing operation, and means for thereafter withdrawing the first die C from said position and performing the second drawing operation while said first die is withdrawn.

5. A drawing press having a first outer die C, a second inner die D fitting within the former, punches cooperating with said dies, said second die being fixedly supported and said first die being movable from its drawing position to permit the second drawing operation without the use of said first die.

6. A drawing press having dies C and D, punches cooperating therewith, a fixed support for the die D, a vertically movable support for the die C, and means connected with the punch actuating mechanism for lowering said vertically movable support and removing said die C from drawing position during the drawing operation with the die D.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM KLOCKE.

Witnesses:

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