

Patented Nov. 9, 1869.

A detailed technical drawing of a mechanical device, possibly a pump or engine component, shown in a perspective view. The device is mounted on a sturdy, A-frame base. A large circular opening in the front of the base reveals internal components, including a piston rod labeled 'M' and a valve mechanism labeled 'N'. The main body of the device is labeled 'A' and 'A'' and features a large, curved, C-shaped component. Various other parts are labeled with letters: 'B' at the bottom right, 'C' at the top, 'D' on a side arm, 'E' on a vertical support, 'F' on a small component, 'G' on a vertical rod, 'H' on a small component, 'I' on a small component, 'J' on a small component, 'K' on a small component, 'L' on a small component, 'M' on a piston rod, 'N' on a valve mechanism, 'O' on a small component, 'P' on a small component, 'Q' on a small component, 'R' on a small component, 'S' on a small component, 'T' on a small component, 'U' on a small component, 'V' on a small component, 'W' on a small component, and 'X' on a small component. The drawing is a black and white line illustration with various labels and dimensions.

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IMPROVEMENT IN DOUBLE-ACTING PRESSES FOR "BLANKING" AND "FORMING UP" SHEET-METAL.

The Schedule referred to in these Letters Patent and making part of the same.

We, JOHN ANNEAR and W. J. GORDON, of the city of Philadelphia, in the State of Pennsylvania, have invented certain Improvements in Double-Acting Presses for "Blanking" and "Forming Up" Sheet-Metal, of which the following is a specification.

Nature and Objects of the Invention.

The first part of our invention relates to the combination of a pair of coupled levers with a "blanking" and a "forming-up" plunger, working together, the one within the other, and operated by the levers, in such a manner, in dies below, that a blank can be cut out, formed up, and discharged therefrom at every revolution of the crank of the operating-shaft, the object of this part of our invention being to facilitate and render more perfect and certain the operation of "blanking" and "forming up" sheet-metal.

The second part of our invention relates to the combination of certain springing stripping-blocks or hooks with the forming-die, in such a manner that the said blocks or hooks will be caused to recede by the operation of forming up the blank, and then be allowed to spring out, and strip off the so-formed blank from the plunger, and allow it to drop, by gravitation, freely from the die, the object of this part of our invention being to render certain the discharge of each successively-"formed-up" blank immediately after it has been so formed up.

The third part of our invention relates to the combination, with the pair of coupled levers and their respective plungers, of a screw-coupling, constructed and applied so as to enable the operator to readily adjust the range of the forming-up plunger within the blanking-plunger, as any changes in the depths of the plungers and dies may require.

Description of the Accompanying Drawings.

Figure 1 is a perspective view of the whole machine, and

Figure 2, an enlarged central vertical section of the plungers, and of the several parts of the die, detached.

General Description.

A B is the frame of the machine or press, which frame should be substantially constructed to resist the vibration of the operating-parts.

C and D are the two connected levers, whereby the respective motions are given to the plungers E and F. These levers are each of the first class, have their fulcrum bearing, respectively, in the uprights of the frame, at *c'* and *d'*, their weight-ends articulated to the respective plungers E and F, through the media of the bars G G and H H, and the power-end of the upper lever C connected, by the screw-coupling I, with the power-arm of the lower lever D, at such a distance from the power-end of the latter as will, in co-operation with the respective points of motion of the levers, cause the weight-end of lever D to move the plunger

F with greater velocity than will be admissible for the plunger E, so that, immediately after the plunger E has cut out the blank, by entering the upper die, the lower end of plunger F will be caused to advance sufficiently beyond the lower end of the containing-plunger E to "form up" the blank in the lower die, and push it through the same before the said plunger E has reached the top of the lower die, as will herein be more fully explained in describing the operation of the machine.

The adjusting-screw I is lengthened or shortened by detaching its lower end, (from the lever D,) and rotating it in the direction required.

Motion is given to the levers C and D by means of a crank, K, connected to the power-end of lever D by means of a coupling-bar, L, the crank's shaft being driven by a band and the usual pulleys, *o o*, or by a foot-lever, M, connected, by the bar *m'*, to the said lever D.

The dies N are constructed of steel, and in three parts, *i. e.*, the blanking or upper die *n'*, (see fig. 2,) the "forming up" or lower die *n''*, and the base-plate *n'''*.

The diameter of the mouth of the blanking-die *n'* corresponds with the outside diameter of the blanking-plunger E, the diameter of the mouth of the forming-up die *n''* corresponds with the diameter of the forming-up plunger F, and the diameter of the opening in the base-plate *n'''* corresponds with the diameter of the enlarged opening 4 of the lower part of the die *n''*.

The top of the die presents a cutting-edge around its mouth, and the bottom of the block has a concentric enlargement, 5, which receives within it the die *n''*.

The die *n''* presents a rounded edge around the upper part of its mouth, and just below the said mouth the block is recessed concentrically, so as to produce an enlarged opening, 4.

In opposite narrow recesses made in the projecting rounded sides of the mouth of die *n''*, two hooked blocks, 6 6, pressed outward by respective springs 7 7, behind them, are so arranged as to yield backward in their respective recesses sufficiently to allow the plunger F, with the formed-up blank attached, to pass through the forming-up portion of the die-block into the enlarged portion 4, and then to spring inward, so that their respective hooks will catch on the edge of said formed-up blank, and hold it down, while the plunger F ascends, and thus lets the said formed-up blank drop down through the opening in the plate *n'''* below.

In the operation of this machine, the crank K forces upward the power-end of lever D, which, by means of the adjusting screw-coupling I, adjusted in its length to bring the lower ends of both plungers in the same plane at the time the blank is being cut out, forces upward, at the same time, the power-end of lever C, and, consequently, the weight-ends of said levers, at the same time, force downward their respective plungers

E and F, by means of the couplings G G and H H, the relative speed and lengths of motion in the plungers being governed by the distances between the points of motion in the respective levers, as connected together by the adjusting screw-coupling I.

The adjustment of the levers C and E, and the relative sizes and forms of the dies and plungers, in this instance, as shown in the drawings, are such as are required for cutting out and forming up circular disks or blanks of tin plate for blacking-boxes; and, the sheet of tin plate being laid on the upper die *n'*, the plunger E descends, and cuts out the blank or disk required; and the plunger F, being more rapid in its motions, immediately projects from plunger E, and "forms up" the circular edge of the blank or disk, by forcing it entirely through the forming-up part of the lower die *n''*, when the hooked blocks 6 6 spring out, and catch upon the turned-up edge or rim of the said blank, and strip the latter off from the plunger F as the latter rises, and thus allows the formed-up blank to drop through the opening in the plate *n'''*, the plunger E not reaching the top of the lower die *n''* until the plunger F has reached the full extent of its downward motion.

The operation of the machine is very simple and ef-

fective, especially for the purpose of blanking and forming up the tops and bottoms of blacking and other boxes of tin-plate sheets.

Claims.

We claim, as our invention—

1. The combination of the levers C and D and the plunger E and F, substantially as and for the purpose hereinbefore set forth and described.
2. The dies *n'* and *n''*, constructed and arranged together, so as to operate, in combination with the respective plungers E and F, substantially as and for the purposes hereinbefore set forth.
3. The combination of the stripping-blocks 6 6 and the lower die *n''*, substantially as and for the purpose hereinbefore set forth.
4. The combination of the adjusting-screw I with the levers C and D and plungers E and F, substantially as and for the purpose hereinbefore set forth.

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Witnesses:

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