

No. 750,746.

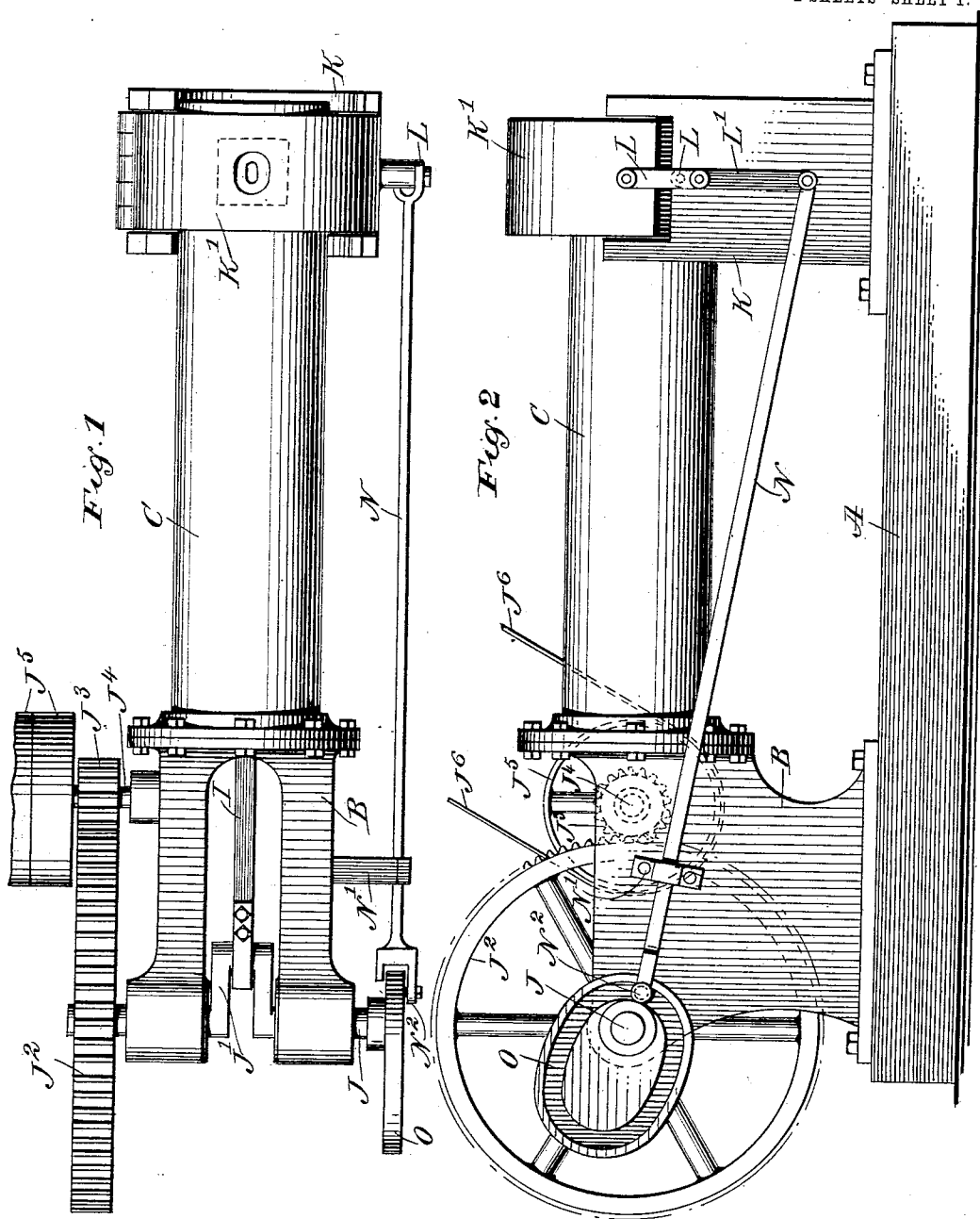
PATENTED JAN. 26, 1904.

O. P. WOODBURN.
PUNCHING MACHINE.

APPLICATION FILED MAY 16, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

John A. Beigelson
Neely Wood

INVENTOR

Oscar P. Woodburn

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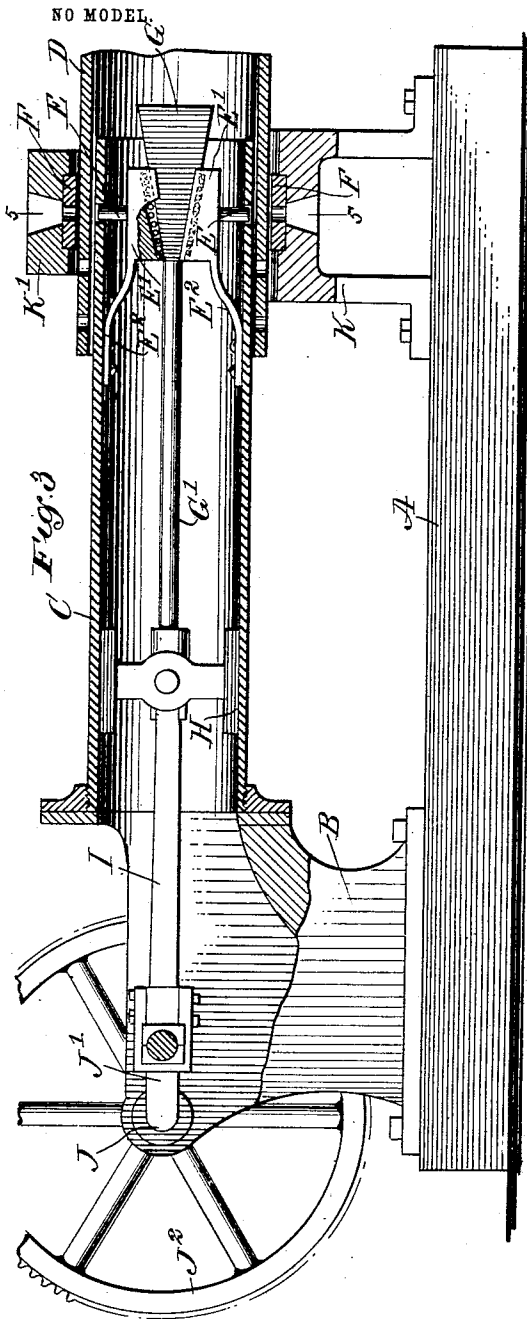
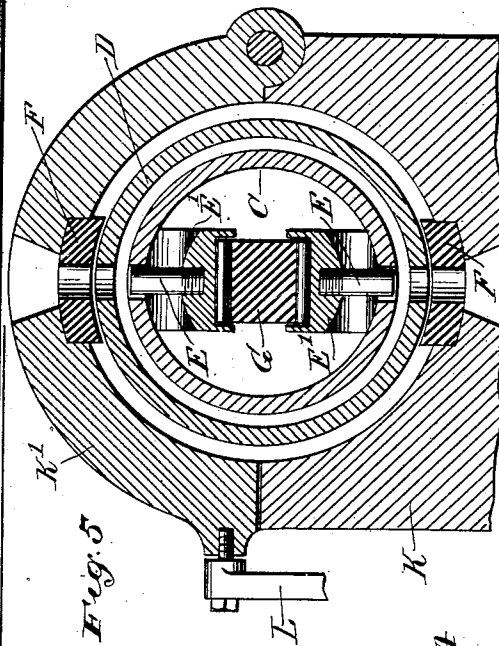
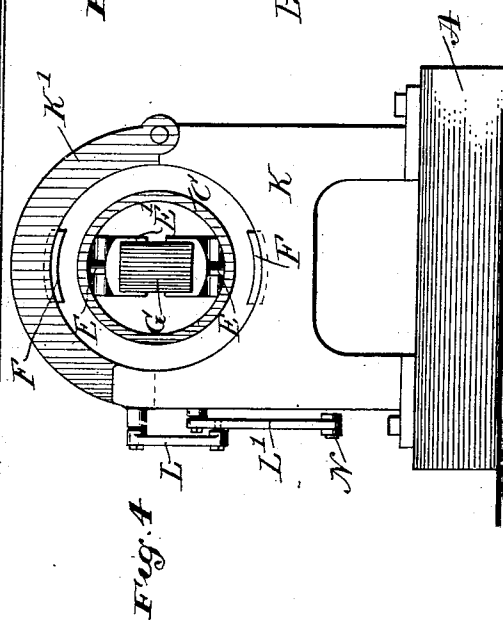
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2 SHEETS—SHEET 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

OSCAR P. WOODBURN, OF PIERCE, TEXAS.

PUNCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 750,746, dated January 26, 1904.

Application filed May 16, 1903. Serial No. 157,395. (No model.)

To all whom it may concern:

Be it known that I, OSCAR P. WOODBURN, a citizen of the United States, and a resident of Pierce, in the county of Wharton and State of Texas, have invented a new and Improved Punching-Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved punching-machine more especially designed for punching holes in hollow bodies—such as pipes, casings, and the like—and arranged to punch the holes from the inside of the hollow bodies in a very simple and economical manner.

The invention consists of novel features and parts and combinations of the same, as will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the improvement. Fig. 2 is a side elevation of the same. Fig. 3 is a longitudinal central sectional elevation of the improvement. Fig. 4 is an end elevation of the same, and Fig. 5 is an enlarged cross-section of the same on the line 5 5 of Fig. 3.

On a suitably-constructed base A is secured a frame or head B, carrying a support C, preferably of tubular shape and of an external diameter corresponding approximately to the internal diameter of the hollow body D, to be provided with holes and slipped onto the free end of the said support C, as plainly indicated in Fig. 3. The holes are punched into the hollow body D while on the support C from the inside thereof, and for this purpose one or more punches E are provided, as shown, two located diametrically opposite each other on the top and bottom of the support C and extending through apertures therein, and the said punches operate in conjunction with dies F, having their openings in alinement with the punches E, and the said dies F fit on the outside of the hollow body D, as plainly indicated in the drawings.

The punches E are preferably held projected from punch-plates E', having spring-arms E², riveted or otherwise fastened to the inside of the support C, so as to allow the punch-plates E' and the punches E to yield while spreading the punch-plates apart by the use of a wedge G, extending between the punch-plates and engaging angular surfaces thereof, as plainly shown in Fig. 3. Roller-bearings or the like may be interposed between the contacting surfaces of the wedge G and the punch-plates E', so as to reduce the frictional contact between the wedge and the punch-plates to a minimum.

The wedge G is secured at its apex end to a rod G', attached to a cross-head H, mounted to reciprocate in the support C, and the said cross-head H is connected by a pitman I with the crank-arm J' of a shaft J, extending transversely and journaled in suitable bearings in the head B.

On one end of the shaft J is secured a gear-wheel J² in mesh with a pinion J³, secured on the main shaft J⁴, journaled on the head B and carrying fast and loose pulleys J⁵, connected by belt J⁶ with other machinery for imparting a continuous rotary motion to the main shaft J⁴. When the rotation of the latter causes the pinion J³ and gear-wheel J² to rotate, the shaft J by the crank-arm J', pitman I, cross-head H, and rod G' imparts a reciprocating motion to the wedge G, so that the latter moves the punch-plates E' apart on the forward stroke of the cross-head H to cause the punches E to engage and punch holes in the walls of the hollow body D. On the return stroke of the cross-head H the wedge G moves outward, and thereby allows the spring-arms E² to return the punch-plates E' and punches E to their normal innermost position.

When the punches E are withdrawn—that is, are in an innermost position at the time the wedge G is in an outermost position—then the hollow body D is shifted on the support C to bring the hollow body in proper position for the punches to punch the next holes at the proper points.

The lowermost die F is held on a saddle K, attached to the base A, and the outermost die

F is secured in a yoke K', pivoted at one end on the saddle K and connected at its free end by a link L with a lever L', fulcrumed on the saddle K and pivotally connected with a rod N, mounted to slide at its forward end in a bearing N', attached to the head B. The extreme forward end of the rod N carries a friction-roller N², engaging a cam O, secured on the shaft J, so that when the latter is rotated the said cam imparts a forward-and-backward sliding motion to the rod N to impart a swinging motion to the lever L', which by the link L imparts an up-and-down swinging motion to the yoke K', pivoted on the saddle K.

Now when the punches E move outwardly for punching the apertures in the hollow body D then the yoke K' is caused to swing downward, so as to bring the uppermost die F in firm contact with the hollow body D to press the latter also in firm contact with the lowermost die F, thereby holding the dies firmly clamped on the hollow body during the time the punches E punch the holes in the hollow body.

When the wedge G is on the return stroke for releasing the punches E, then the yoke K' is caused to swing upward to release the hollow body D, and thereby permit the operator to shift the same for the purpose previously described.

I do not limit myself to the particular construction of the individual mechanisms and parts shown and described, as the same may be varied without deviating from the spirit of my invention.

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

1. A punching-machine comprising a support for the article to be punched, an inside punch in the support, movable outward, to punch the article from the inside, and a die on the outside of the article, in alinement with the inside punch, as set forth.

2. A punching-machine comprising a support for the article to be punched, an inside punch in the support, movable outward, to punch the article from the inside, a die on the outside of the article, in alinement with the inside punch, and means for automatically locking the die in place on the article, as set forth.

3. A punching-machine comprising a hollow support, over which the article to be punched is slipped, inside punches within the support, movable outward to punch the article from the inside, and dies on the outside of the article, in alinement with the inside punches, as set forth.

4. A punching-machine comprising a hollow support, over which the article to be punched is slipped, inside punches within the support, movable outward to punch the article from the inside, dies on the outside of the article, in alinement with the inside punches, and

means for automatically locking the dies in place on the article, to hold the latter against movement during the punching operation, as set forth.

5. A punching-machine comprising a support for the article to be punched, an inside punch in the support, movable outward to punch the article, a spring-pressed punch-plate for carrying the said punch, and a wedge for engaging the punch-plate, to move the same and the punch, for the latter to punch the article from the inside, as set forth.

6. A punching-machine comprising a hollow cylindrical support, over which the article to be punched is shifted, a plurality of punches inside of the said support and arranged opposite each other, to punch the article from the inside, spring-supported punch-plates carrying the said punches, and a reciprocating wedge between the said punch-plates for moving the same in opposite directions, to cause the punches to punch the article, as set forth.

7. A punching-machine comprising a hollow cylindrical support, over which the article to be punched is shifted, a plurality of punches inside of the said support and arranged opposite each other, to punch the article from the inside, spring-supported punch-plates carrying the said punches, a reciprocating wedge between the said punch-plates for moving the same in opposite directions, to cause the punches to punch the article, dies for engaging the outside of the article to be punched and arranged in alinement with the said punches, a saddle for carrying one of the dies, and a yoke hinged on the saddle and carrying the other die, the yoke having an up-and-down swinging movement, to move the dies in and out of engagement with the article to be punched, as set forth.

8. A punching-machine comprising a hollow cylindrical support, over which the article to be punched is shifted, a plurality of punches inside of the said support and arranged opposite each other, to punch the article from the inside, spring-supported punch-plates carrying the said punches, a reciprocating wedge between the said punch-plates, for moving the same in opposite directions, to cause the punches to punch the article, dies for engaging the outside of the article to be punched and arranged in alinement with the said punches, a saddle for carrying one of the dies, a yoke hinged on the saddle and carrying the other die, the yoke having an up-and-down swinging movement, to move the dies in and out of engagement with the article to be punched, and means, substantially as described, for simultaneously actuating the said wedge and the said yoke, as set forth.

9. A punching-machine, comprising an apertured support, an outwardly-movable punch in the support, means for moving the punch outward through the aperture of the support,

and a die outside of the support and between which and the said support the article to be punched is adapted to be passed, as set forth.

port the article to be punched is adapted to be 10
passed, as set forth.

In testimony whereof I have signed my name to this specification in the presence of the two subscribing witnesses.

OSCAR P. WOODBURN.

Witnesses:

F. E. USTYNEK,
GILBERT CHILD.

5 10. A punching-machine, comprising a hollow apertured support, a spring-pressed punch arranged in the hollow support, means for moving the punch outward through the aperture of the support, and a die outside of the support and between which and the said sup-