

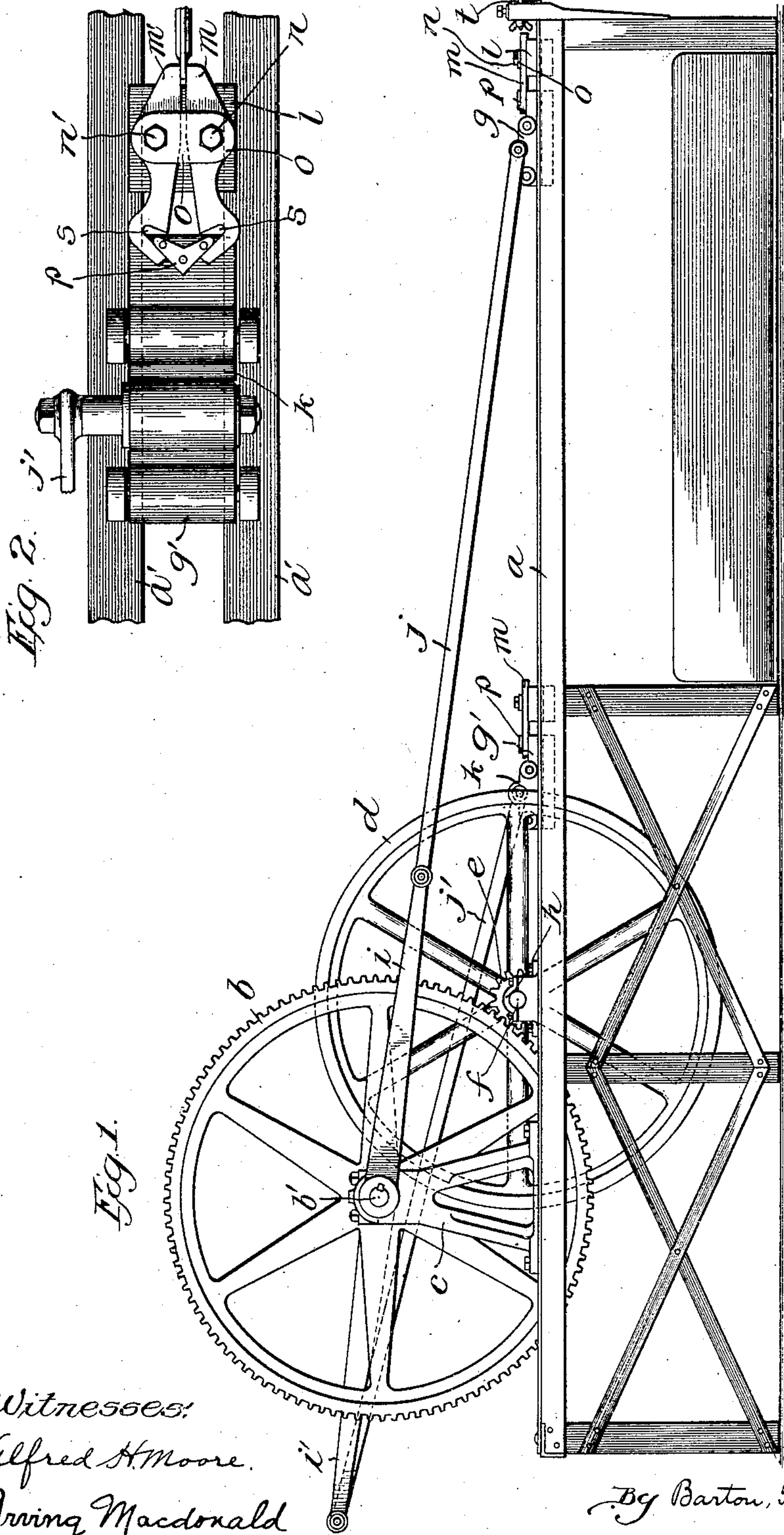
No. 874,953.

PATENTED DEC. 31, 1907.

G. W. FROHLICH.
METAL DRAWING MACHINE.

APPLICATION FILED JAN. 28, 1907.

2 SHEETS—SHEET 1.



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Att'y's.

UNITED STATES PATENT OFFICE.

GEORGE W. FROHLICH, OF CHICAGO, ILLINOIS.

METAL-DRAWING MACHINE.

No. 874,953.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed January 28, 1907. Serial No. 354,354.

To all whom it may concern:

Be it known that I, GEORGE W. FROHLICH, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Metal-Drawing Machines, of which the following is a full, clear, concise, and exact description.

My invention relates to a machine for drawing strips of sheet metal through a die for the purpose of shaping the same, and its object is to provide a machine which will be of simple construction and efficient and reliable in operation.

My invention is particularly adapted for the manufacture of metallic moldings and the like. The sheet metal from which the moldings are to be made is cut into narrow strips, which are drawn through a die by the machine of my invention. Frequently it is necessary to put the metal strips through two operations in order to shape them into the required form, and in the preferred form of my invention I mount two of my drawing devices side by side upon a double frame, so that the strips may conveniently be put through two successive operations. This arrangement is also desirable for the reason that both of the drawing devices may be driven by a single source of power.

In accordance with my invention, a gripping device is mounted to reciprocate upon a track or path of movement toward and from a stationary die. Any suitable means may be employed for reciprocating the gripper, but I preferably employ a crank lever. The gripper is so constructed that the pull of the crank lever upon it at the beginning of its forward movement causes a pair of clamping jaws to be tightly closed together, and the thrust of the crank lever at the beginning of the return movement of the gripper operates to separate or open the said clamping jaws, so that a piece of sheet metal may be securely held by the clamping jaws and drawn through the die during the forward movement of the gripper and immediately released at the beginning of its backward movement.

I will describe my invention more particularly by reference to the accompanying drawings, in which

Figure 1 is a side elevation of the drawing machine; Fig. 2 is a plan view of the gripping device; Fig. 3 is a plan view of the machine; Fig. 4 is a view of the end of the frame

at which the dies are located; and Fig. 5 is a cross sectional view on line 5—5 of Fig. 3.

The same letters of reference indicate the same parts throughout all the figures.

The frame of the machine illustrated in the drawings consists of four heavy angle irons a , a^1 , mounted upon four pairs of posts, with suitable cross pieces and braces to secure strength and rigidity. The angle irons are arranged in pairs, as shown in Fig. 3, each pair being adapted to form a track upon which one of the grippers reciprocates. The manner in which the angle irons are mounted is clearly shown in Fig. 5.

Near the forward end of the frame, a gear wheel b is mounted upon a shaft b^1 journaled in bearings c , c securely bolted to the top of the frame. A driving wheel d and a pinion wheel e are mounted upon a shaft f journaled in bearings h , h , said pinion wheel e meshing with the gear wheel b . The shaft b^1 of the gear wheel b is provided with opposed crank arms i , i^1 which rotate outside the frame. The forward ends of the rods j , j^1 are journaled to said crank arms, the rear ends of said rods being attached to the grippers g , g^1 respectively. The gear wheel b is adapted to be rotated in a clockwise direction, and it is apparent that the rotation of said gear wheel will operate the crank levers to reciprocate the grippers g and g^1 upon their tracks, alternately; that is, while one is moving forward the other is moving backward, and vice versa. This arrangement affords economy and regularity in the consumption of power, and produces the least strain upon the machine, since only one strip of metal can be drawn at a time, yet one or the other of the two grippers will be drawing practically all the time.

The gripping or clamping device is mounted upon two metal carrying-blocks k , l . The opposed clamping jaws m , m^1 are rigidly held upon the block l by bolts n , n^1 and the metal plate o , said plate o also serving to prevent the upper portions of the bolts from bending or spreading apart under the strain of the clamping operation. The block k carries at its rear end a metal wedge-piece p having two opposed inclined surfaces upon each of its front and rear sides. This wedge-piece is firmly secured to the carrying block and forms a part thereof. The wings of the wedge-piece lie loosely in the slots s , s in the front ends of the clamping jaws.

The carrying blocks *k l* are formed with grooves in their sides, to slide back and forth upon the angle irons. The carrying block *l* is adapted to fit rather tightly between the angle irons, so that its movement thereon will be opposed by a slight amount of frictional resistance, the block coming to a momentary stop during the interval in which the gripper is reversing its direction of travel at either end of its journey. The first movement of the wedge-piece, in either direction, therefore serves to operate the clamping jaws, opening or closing them, as the case may be, after which the carrying block *l* follows any further movement of said wedge-piece and takes up its regular traveling movement. In other words, the carrying block *l*, and the clamping jaws mounted thereon, are always at rest at the instant the clamping jaws are being operated, either to clamp or to release. The clamping portions of the jaws are thus tightly closed together during the whole of their forward movement, and are open, or released, during the whole of their return movement. The carrying block *k*, as shown in the drawing, is mounted upon wheels so as to move with the slightest friction.

The operation of the gripper is as follows: When the carrying block *k* starts its forward movement, the opposed inclined surfaces upon the front side of the wedge-piece *p* tightly engage the corresponding inclined surfaces on the front sides of the slots *s s*, thus forcing the front ends of the clamping jaws *m m'* apart and closing their rear ends tightly together. As is apparent, when the rear ends of the jaws are closed together, their front ends cannot be spread any farther apart, but become rigid, so that the further pull of the carrying block *k* draws the clamping jaws and carrying block *l* along with it. When the gripper reaches the end of its forward movement and starts back, the above described operation is reversed, the carrying block *k* in its backward motion causing the two opposed inclined surfaces upon the rear side of the wedge-piece to engage the corresponding inclined surfaces on the rear sides of the slots *s s* of the clamping jaws, forcing the front ends of the clamping jaws together and opening or releasing the rear ends or clamping portions of the jaws. The jaws of the gripper thus remain open

during the backward movement. It will be seen that the gripper is adapted to be automatically operated to positively close the clamping portions of the jaws at the beginning of its forward movement, and to positively open the clamping portions of the jaws at the beginning of its backward movement.

The location of the die is indicated at *t*, Fig. 4. When it is desired to draw a strip of metal, the end of the strip is projected through the die and placed between the clamping jaws of the gripper when said gripper reaches the rear end of its path of movement. The gripper immediately operates and starts its forward movement, and the strip of metal is thus drawn through and shaped. As already explained, when the gripper reaches the forward end of its journey, the clamping jaws are released an instant before said jaws and carrying block *l* begin their backward movement, so that a strip of metal which has been drawn is permitted to immediately fall away so as not to obstruct the gripper in its return movement.

While I have described and illustrated a form of apparatus which I prefer to use, it will be apparent that numerous modifications may be made without departing from the spirit of my invention. I do not therefore wish to limit myself to the particular form shown, but

What I claim is:

1. A gripping device comprising a carrying block, a pair of clamping jaws pivotally mounted thereon, inclined slots near the forward ends of said clamping jaws, and a movable wedge member engaging said slots to operate said clamping jaws.

2. A gripping device comprising a carrying block, a pair of clamping jaws pivotally mounted upon said carrying block, inclined slots in the forward ends of said clamping jaws, and a wedge member having two pairs of inclined surfaces adapted to engage corresponding inclined surfaces in the slots in said clamping jaws.

In witness whereof I, hereunto subscribe my name this 23rd day of January A. D., 1907.

GEORGE W. FROHLICH.

Witnesses:

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