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PATENTED MAY 23, 1905.

W. M. GREENLEAF & E. W. HADEN.
FEED MECHANISM FOR PUNCHES.

APPLICATION FILED MAY 14, 1904.

2 SHEETS—SHEET 1.

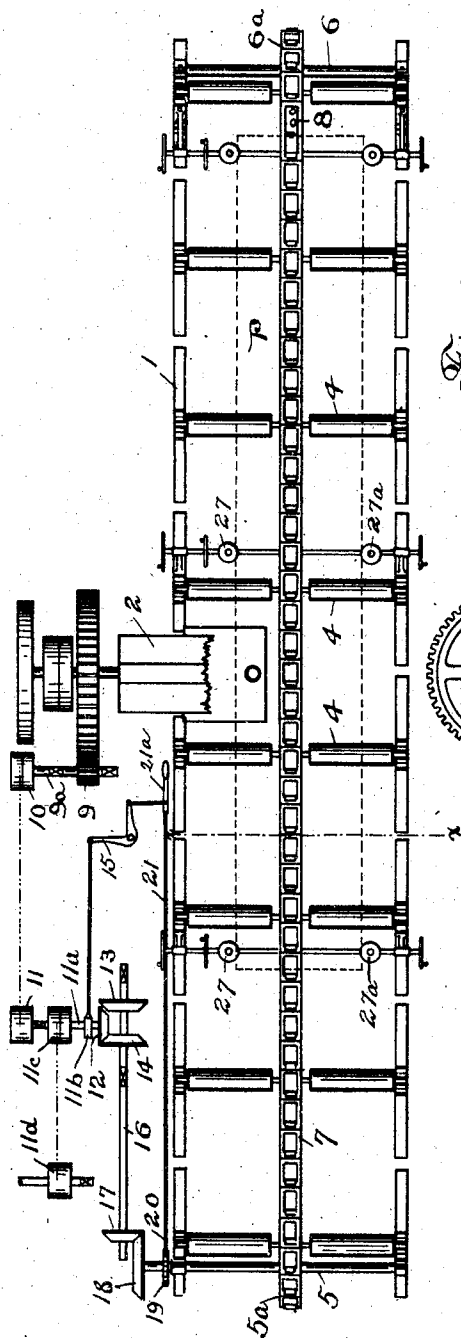


Fig. 1.

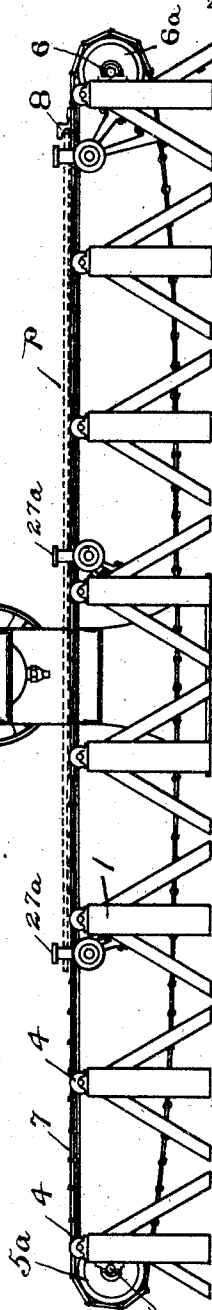


Fig. 2.

WITNESSES:

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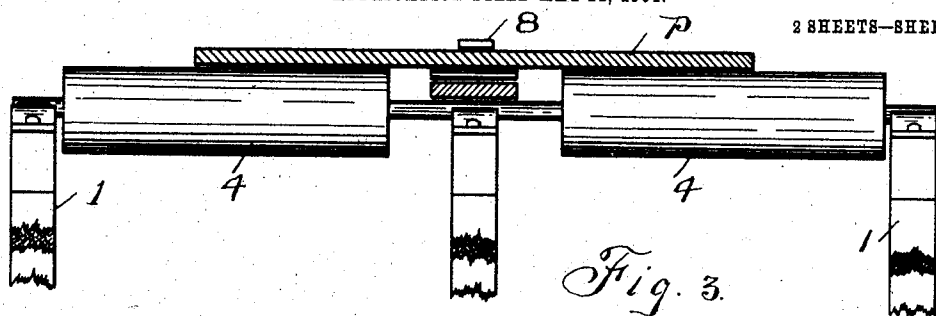


Fig. 3.

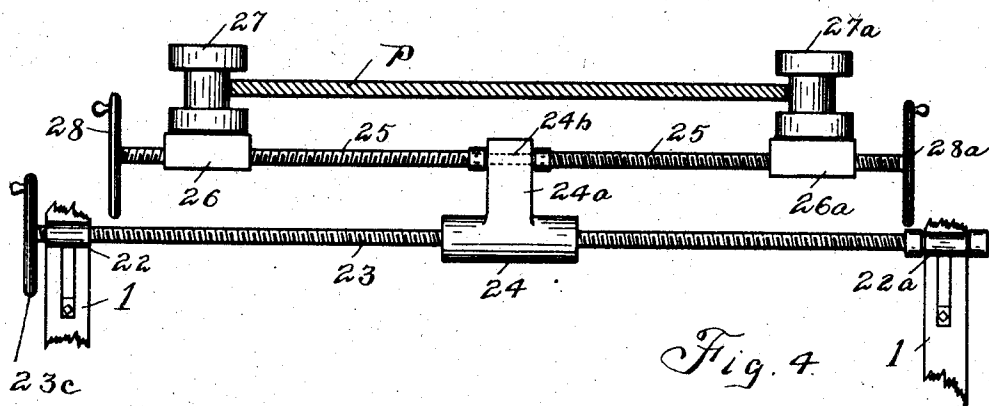


Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM M. GREENLEAF AND EDWARD W. HADEN, OF WEST BAY CITY,
MICHIGAN.

FEED MECHANISM FOR PUNCHES.

SPECIFICATION forming part of Letters Patent No. 790,361, dated May 23, 1905.

Application filed May 14, 1904. Serial No. 207,949.

To all whom it may concern:

Be it known that we, WILLIAM M. GREENLEAF and EDWARD W. HADEN, citizens of the United States, residing at West Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Feed Mechanism for Punches; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention is a machine for use in ship-yards, boiler-shops, and similar works.

The object is to facilitate the feeding of heavy steel plates to a punch so as to reduce the amount of labor and increase the speed of the operation.

The machine may be used in connection with a drill, countersink, or punch, if desired.

The invention further consists in means whereby the plate may be fed step by step to the punch, so that the holes will be automatically spaced along the plate without the necessity of laying out the holes beforehand.

A further improvement consists in means for shifting the plate laterally toward or from the punch and for advancing the plate toward or from the punch so that the holes may be punched along a line not parallel with the edge of the plate.

With these objects and certain others which will appear later in the specification in view the device consists in the mechanisms shown in the accompanying drawings, in which—

Figure 1 is a top plan view of the device applied to a punch. Fig. 2 is a front elevation of the parts shown in Fig. 1. Fig. 3 is an enlarged section taken on the line *xx* of Fig. 1. Fig. 4 is a detail showing in side elevation the device for shifting the plate laterally.

As is clearly shown in the drawings, the machine consists in a series of posts 1 or other suitable framework set in front of the punch 2 parallel with the direction of travel of the material through the punch. On top of the posts 1 is mounted a series of idler-rollers 4, upon which the plate P rests as it is moved along the table, and its edge passes through the punch. At one end of the series of posts

is a shaft 5, carrying a chain-sprocket 5^a, and at the opposite end is a similar shaft 6, carrying a sprocket 6^a. The chain 7 connects these sprockets and is moved forward by means of the power-shaft 5 and the driving-shaft 5^a. The chain is provided with a suitable lug 8 to receive and hold the rear edge of the plate P and also to move it forward along the series of idler-rollers 4. In Figs. 1 and 2 the plate P is indicated by dotted lines.

Continuous motion may be imparted to the chain 7 and plate P in any suitable manner, as by means of the pinion 9, which meshes with the power-gear of the punch. Connected to the shaft 9^a of the pinion 9 is a pulley 10, bolted to a second pulley 11, which is fixed to the shaft 11^a. The inner end of the shaft 11^a is mounted in a suitable eccentric box 11^b and carries a friction-cone 12, which may be thrown into gear with either of two bevel friction-wheels 13 or 14 by means of the bell-crank lever 15 and suitable connecting-rods, as shown in Fig. 1. By this means rotary motion in either direction is imparted to the shaft 16 and through gears 17 and 18 to the shaft 5.

It is sometimes desirable to drive the shaft 11^a independent of the mechanism of the punch. In such a case a pulley 11^c is mounted on a shaft 11^d and driven from a pulley 11^d, attached to any convenient shafting.

By operating the bell-crank lever to shift the friction-cone 12 against one or the other of the wheels 13 or 14 the plate P may be advanced toward or withdrawn from the punch in a longitudinal direction.

To produce a uniform step-by-step movement of the plate P, we provide on the shaft 5 a ratchet-wheel 19 of any suitable or usual construction and adapted to be locked by a suitable pawl 20, which may be so constructed as to release one tooth of the wheel at a time, and thus permit the chain 7 to move forward a fixed distance with each operation of the pawl. The pawl, which may be of any suitable construction to form an escapement for the ratchet-wheel 19, is connected by a rod 21 with a lever 21^a under the control of the operator. By throwing the friction-cone 12

into mesh with one of the wheels 13 or 14 the shaft 5 tends to rotate, but is prevented from doing so by the ratchet-wheel 19, which is locked by pawl 20; but upon releasing the pawl 20 the ratchet is released and permitted to move forward one tooth, thus revolving the shaft 5 a distance equivalent to the pitch distance of the ratchet-teeth. To shift the plate sidewise, we provide the mechanism shown in Fig. 4, where 22 and 22^a are brackets carried by the posts 1 and journaled to revolvably support a threaded shaft 23, that extends transversely across from beneath plate P. Threaded on the shaft 23 is a traveling nut 24. An upwardly-extending arm 24^a, carried by the nut 24, has a journal 24^b, in which is mounted a right and left hand screw 25, so as to revolve in the journal, but is incapable of lengthwise movement. On the right and left hand threaded portions of the screw are mounted two traveling nuts 26 and 26^a. Upon these nuts are idler-rollers 27 and 27^a, adapted to engage the edges of the plate P. The ends of the screws 25 are provided with hand-wheels 28 and 28^a. By turning either of these wheels the idlers 27 and 27^a may be simultaneously thrown toward or away from the longitudinal center line of the frame. Similarly the rollers may both be shifted sidewise by turning the wheel 23^c, carrying with them the plate P. The rollers do not interfere with the longitudinal movement of the plate, but may be shifted, as above described, whether the plate P is in motion or stationary. In practice we prefer to provide several sets of such lateral shifting devices along the length of the frame, as shown in Figs. 1 and 2.

What we claim as our invention, and desire to secure by Letters Patent, is as follows:

1. In combination with a punching-machine, a framework located in front of said machine and extending parallel to the direction of feed, said framework having idler-rollers on its upper surface; a chain-sprocket at each end of said framework; a chain carried by said sprockets; plate-holding lugs on said chain; means for rotating one of said sprockets, and means whereby said chain may be moved with

step-by-step movement; together with means for shifting said plate laterally with respect to said chain, substantially as described.

2. In combination with a punching-machine, a framework located in front of said machine and extending parallel to the direction of feed, said framework having idler-rollers on its upper surface; a chain-sprocket at each end of said framework; a chain carried by said sprockets; plate-holding lugs on said chain; gears adapted to drive one of said shafts; a friction-wheel actuated by the driving-gear of the punch for operating said gears; a ratchet-wheel carried by said driving-shaft and a pawl adapted to intermittently release said ratchet-wheel, whereby said chain may be moved with step-by-step movement, substantially as described.

3. In combination with a punching-machine, a framework located in front of said machine and extending parallel to the direction of feed, said framework having idler-rollers on its upper surface; a chain-sprocket at each end of said framework; a chain carried by said sprockets; plate-holding lugs on said chain; gears adapted to drive one of said shafts; a friction-wheel actuated by the driving-gear of the punch for operating said gears; a ratchet-wheel carried by said driving-shaft and a pawl adapted to intermittently release said ratchet-wheel, whereby said chain may be moved with step-by-step movement; and means for shifting said plate laterally, said means comprising idler-rollers engaging the opposite edges of the plate, traveling nuts supporting said rollers, a right and left hand screw threaded into said nuts, a bracket for supporting the middle portion of said screw, and means for imparting transverse movement to said bracket; substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM M. GREENLEAF.
EDWARD W. HADEN.

Witnesses:

A. A. EASTERLY,
W. I. CATHCART.