

L. C. KOEHL.  
 GAGE DEVICE FOR PUNCHING MACHINES.  
 APPLICATION FILED OCT. 28, 1912.

1,135,531.

Patented Apr. 13, 1915.

3 SHEETS—SHEET 1.

FIG. 1

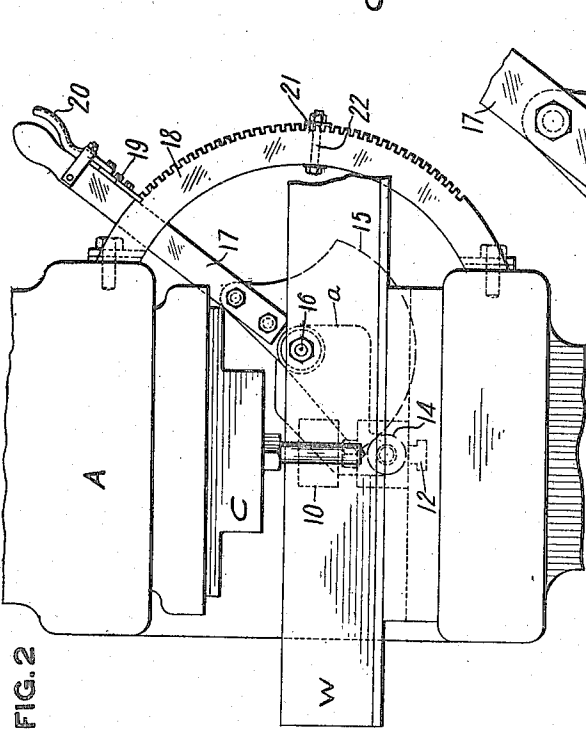
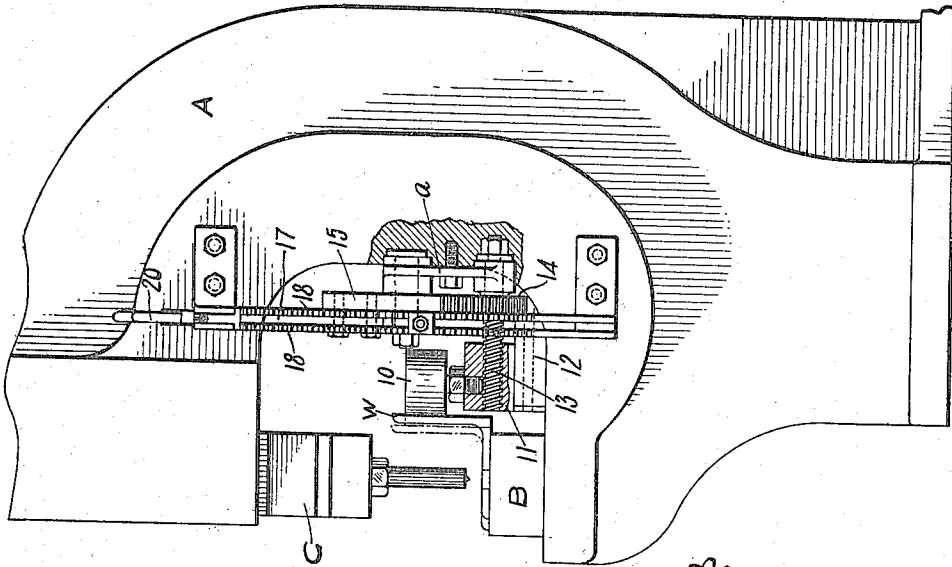


FIG. 2

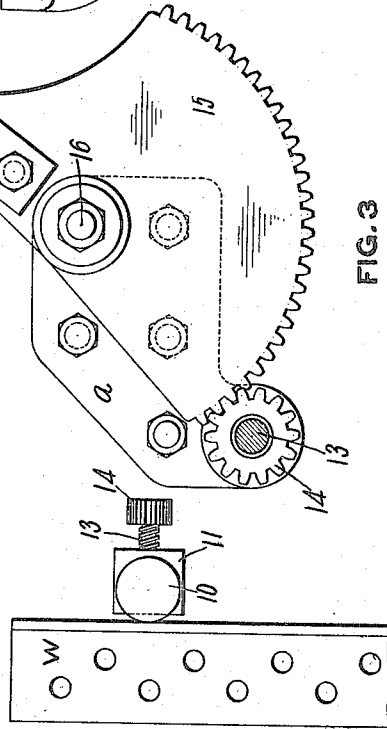


FIG. 3

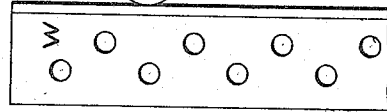


FIG. 4

WITNESSES

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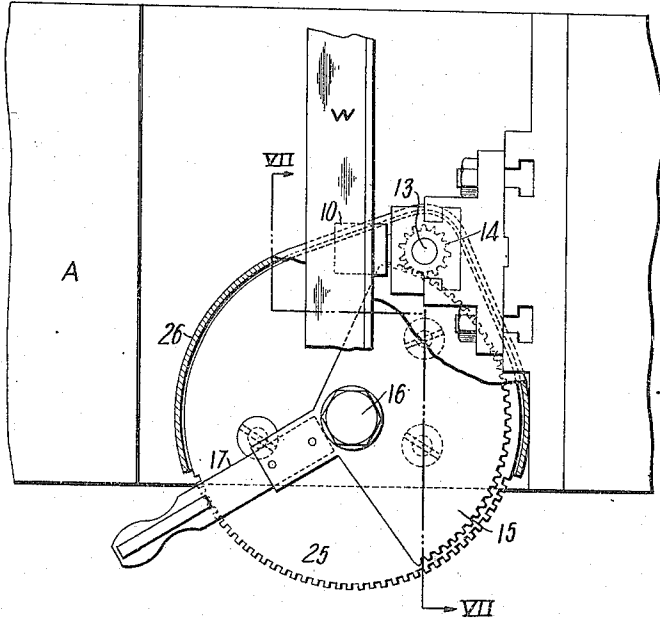


FIG. 8

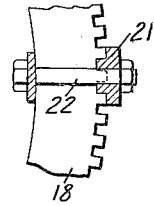


FIG. 5

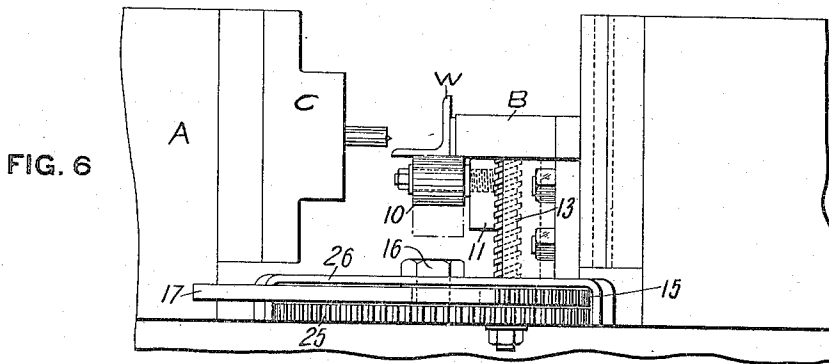


FIG. 6

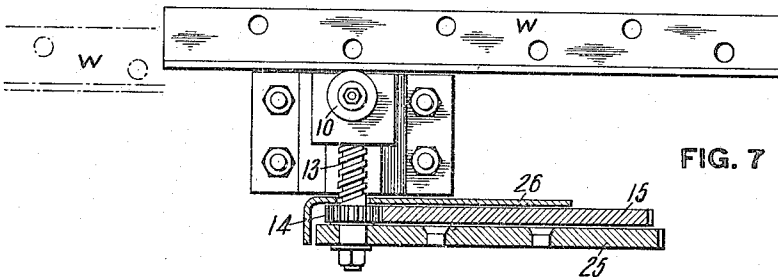


FIG. 7

WITNESSES

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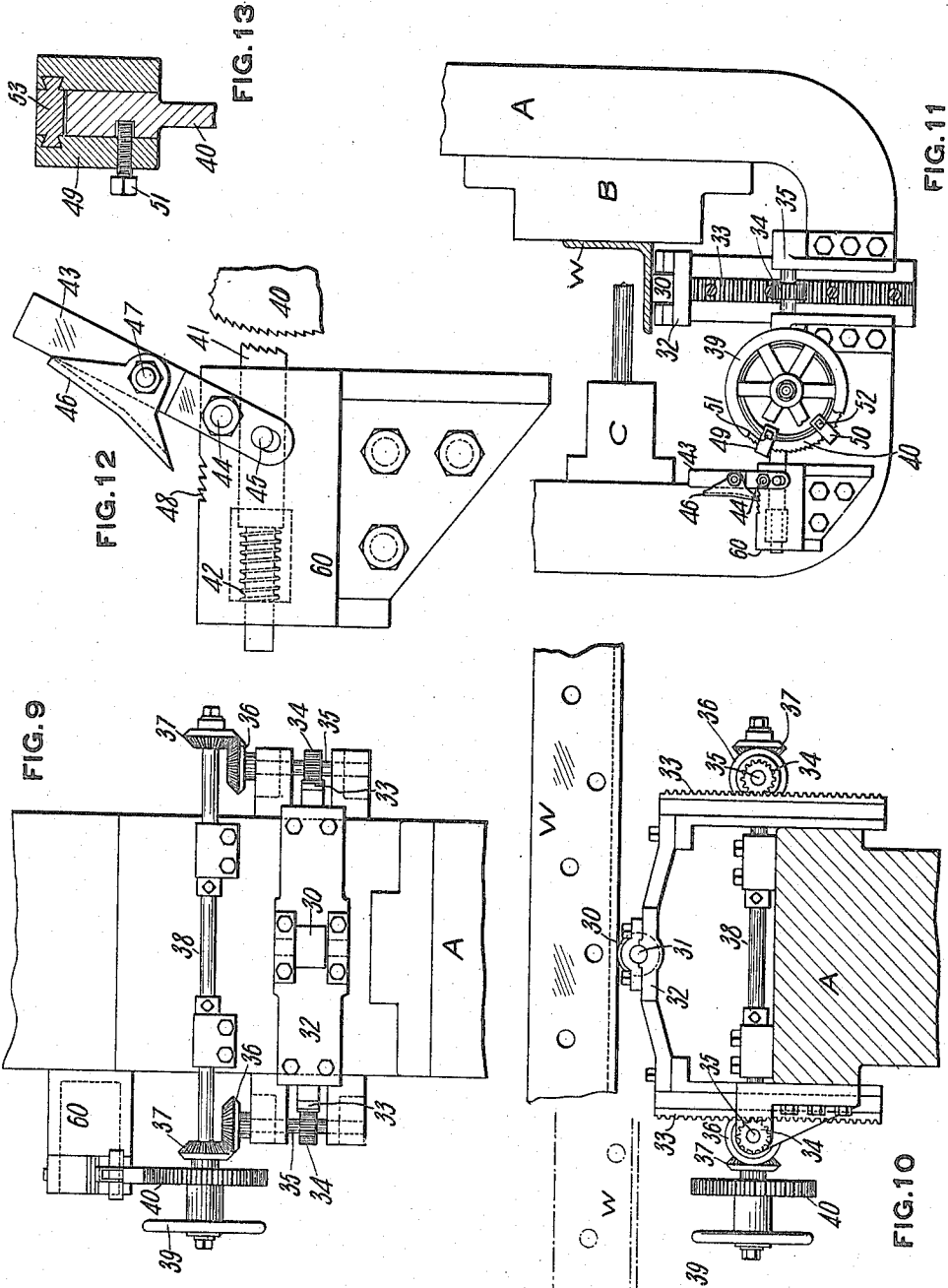
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3 SHEETS—SHEET 3.



WITNESSES

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# UNITED STATES PATENT OFFICE.

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## GAGE DEVICE FOR PUNCHING-MACHINES.

1,135,531.

Specification of Letters Patent.

Patented Apr. 13, 1915.

Application filed October 28, 1912. Serial No. 728,121.

*To all whom it may concern:*

Be it known that I, LOUIS C. KOEHL, of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Gage Devices for Punching-Machines, of which the following is a specification.

My invention consists in various improvements in the construction and arrangement of parts of metal punching machines, relating particularly to that type of machine designed for punching holes in metallic members, as structural iron.

The prime object of the present invention is to provide mechanism for moving the work operated upon transversely of its feed through the machine, or back and forth transversely of the punching machine, in order to position said holes in a staggered or other desired relation.

In the accompanying drawings, which illustrate applications of my invention, and on which similar reference characters indicate similar parts, Figure 1 is a side elevation of that part of a metal punching machine of the type described embodying the mechanism to which my invention particularly relates; Fig. 2, a front elevation of the same; Fig. 3, a detailed view showing the operating segment on an enlarged scale; Fig. 4, a detailed view showing the transversely traversing mechanism in top plan; Fig. 5, a top or plan view of like parts in a horizontal machine; Fig. 6, a side elevation thereof; Fig. 7, a section on dotted lines VII—VII of Fig. 5; Fig. 8, a detail view showing a regulating stop or limiting device on enlarged scale; Fig. 9, a top or plan view of another modified form; Fig. 10, a cross section through the same; Fig. 11, a side elevation thereof; Fig. 12, a detailed view showing a holding dog mechanism on an enlarged scale; and Fig. 13, a detail view illustrating stops controlling the movement of work.

Referring to the drawings, the portions marked A represent the frame of the machine, B a work engaging block, and C a reciprocating plunger carrying the die or punch. These several parts are or may be of any approved construction and arrangement and need no special description. The mechanism for reciprocating the plunger

carrying the punch, and many other details of the machine, including the mechanism for feeding the work, are not shown as they are well understood, and in no manner modify the operation of the parts constituting my present invention which relates solely to the mechanism for moving or sliding the work back and forth transversely of the line of its feed so as to position the holes in longitudinal lines, either a uniform or non-uniform distance apart, or in a staggered relation to each other or other desired position.

In Figs. 1, 2, 3 and 4, the mechanism for accomplishing this result comprises a roller 10 mounted on a vertical spindle on a transversely sliding block 11 comprising a work holder. Said block is mounted in guides 12 located on the frame and is formed with a screw threaded transverse perforation. A screw 13 is mounted in said perforation and provided on its outer end with a pinion 14. A toothed segment 15 is mounted on a pivot 16 carried on a bracket *a* on frame A. The teeth of said segment operatively engage with the teeth of said pinion 14. Said segment 15 is also provided with an operating lever 17, which extends outwardly between curved guides 18 attached to the side of the frame. Said guides are formed with teeth in their outer edges with which a pawl 19 on said lever 17 is adapted to engage. Said pawl is operated by hand lever 20 of a common type which will be readily understood. A stop comprising a block 21 is adjustably secured on said guides 18, being formed with teeth adapted to engage with the teeth of their edges and held in any desired position by means of a clamping bolt 22.

In operation, the work W mounted upon the block B rests against the roller 10, as shown in Figs. 1 and 4. The plunger C being reciprocated by the mechanism provided for the purpose (not shown), a hole is punched in the work in the usual manner. The operator then throws lever 17 from the position shown in Figs. 1 and 2 to a position where it will contact with the stop 21, which, through the gear connection and the screw 13, will operate to slide block 11 outward and through the roller 10, slide the work transversely of the punching machine for a predetermined distance. This opera-

tion takes place during the feeding of the work longitudinally for the distance between adjacent holes. The reciprocating plunger is again operated and the next hole punched after which lever 17 is thrown back to the position shown in Figs. 1 and 2 and the work slid inward following the inward motion of the roller 10. The punch is again operated and the work continued in this manner until the number of holes desired have been punched. As illustrated, the two lines of holes are a uniform distance apart transversely of the work and the adjacent holes also a uniform distance apart longitudinally of the work, but, if desired, the holes may be differently arranged. By this means, the work is formed rapidly and accurately, as will be readily understood.

In Figs. 5, 6 and 7, I have illustrated mechanism of substantially the same character applied to a machine wherein the punch operates in a horizontal direction, instead of a vertical direction, as shown in Figs. 1 and 2. For the purpose of illustration, it may be said that the mechanism illustrated in said figures is substantially the machine of Figs. 1 and 2 laid upon its side. The segment 15 is operated by the lever 17 in like manner as described for the other type of machine but in lieu of the double curved guides 18 a single guide plate 25 with toothed edge is mounted on the under side of said lever 17 and a guard plate or shield 26 is mounted to cover the principal part of the top and edges of said plate. In operation the turning of lever 17 in one direction will elevate block 11 and roller 10 together with the work W, and when it is turned in the opposite direction the work will be lowered as the block 11 recedes.

In Figs. 9, 10, 11 and 12, I have shown another modification in the construction, particularly adaptable for the horizontal machine. In this form the work supporting roller 30 is carried on a spindle 31 journaled on a bar 32 which forms a part of a reciprocating frame having rack-bars 33 on its opposite sides. Said rack-bars are engaged by pinions 34 mounted on horizontal shafts 35, journaled in suitable bearings on the machine frame. Said shafts are provided with miter gears 36 on their inner ends which mesh with corresponding gears 37 on an operating shaft 38 journaled in suitable bearings on the frame. Said operating shaft is provided with an operating hand lever 39 on its outer end with a ratchet wheel 40 adjacent thereto. A sliding pawl 41 is mounted in a bracket 60 on machine frame adjacent to the edge of said ratchet wheel and provided with teeth adapted to engage with the ratchet teeth on the periphery of said wheel. A spring 42 interposed between one end of a socket in said bracket and a shoulder on said pawl is

adapted to normally force the outer end of said pawl into engagement with said wheel. A lever 43 mounted on a pivot 44 on the side of bracket 60 engages by means of an elongated slot near its lower end with a pin 45 which is mounted in the side of said pawl and projects through a slot in the casings surrounding said pawl. Another pawl 46 is mounted on a pivot 47 on lever 43 and is adapted to engage with notches 48 in the upper edge of the frame.

When the parts are in the position shown in Figs. 9, 10 and 11 the turning of wheel 39 will operate through the gear connections just described to vertically reciprocate the frame 32 and the roller 30 carried thereby. When said frame is elevated it will carry the work with it and when depressed will permit the work to fall, in same manner as described for the construction shown in Figs. 5, 6 and 7. Stops 49 and 50 are adjustably mounted by means of screws 51 and 52 on the side of wheel 40 and project beyond its periphery in position to contact with the opposite sides of pawl 41 and limit the oscillation of wheel 40 to secure any predetermined reciprocation of the frame 32 and the work carried thereby. Member 53 is a dovetailed connection between stop-members 49 and 50, and engages the top and bottom of pawl 41 for the purpose of limiting vertical setting of the work being punched.

When the work has been elevated to the position for the punch to operate, pawl 41 engaging with ratchet wheel 40 will hold said work in the elevated position, but as soon as the punch has been operated and it is desired for the work to fall back, said pawl is receded from its engagement with ratchet 40 by throwing lever 43 to the position shown in Fig. 12. The movement of the lever 43 to the position shown in Fig. 12 having released the pawl 41 from engagement with the wheel 40, the work elevating mechanism is free to return to its position either by gravity alone or aided by manipulation of the hand wheel 39, the movement of the latter continuing until the stop 49 engages with the pawl 41, thus serving to limit the downward movement of the elevating mechanism.

The machine can thus be regulated for positioning the holes in lines any distance apart transversely that may be desired and operated to secure the predetermined relative position with accuracy and speed.

What I claim is:—

1. In a metal punching machine, the combination with a punching mechanism, of operable means including a transversely movable rotary member for moving the work back and forth transversely of the punching mechanism.

2. In a metal punching machine, the com-

5 bination with a punching mechanism, of operable means for moving the work back and forth transversely of the punching mechanism including a rest against which the work is adapted to bear, a rotary screw for moving the rest, and a rocking lever for rotating the screw.

10 3. In a metal punching machine, the combination with a punching mechanism, of operable means for moving the work back and forth transversely of the punching mechanism including a rest against which the work is adapted to bear, a rotary screw for moving the rest, means for rotating the screw, and means for limiting the movement of the second mentioned means.

20 4. In a metal punching machine, the combination with a punching mechanism, a rest against which the work is adapted to bear, a base supporting said rest, and gearing for sliding said base transversely of the punching mechanism, whereby the work may be moved back and forth to position the holes in staggered relation in longitudinal lines.

25 5. In a metal punching machine, the combination with a punching mechanism, a work rest or support mounted on a base, said base formed with a transverse screw threaded perforation, a screw mounted in

said perforation and provided with a pin- 30 ion, a gear connected with said pinion for operating the same, a lever for operating said gear, and a stop for limiting the movement of said lever at a predetermined point, whereby the movement of said work may be 35 regulated to position the lines of holes the distance apart desired.

6. In a metal punching machine, the combination with a punching mechanism, a slid- 40 ing work holder, a screw engaging said work holder and rotatable to impart a transverse movement to said work holder, a pinion on said screw, a segment engaging said pinion, and means for limiting the movement of said pinion. 45

7. In a metal punching machine, the combination with a punching mechanism, a transversely movable work holder, and means for imparting movement to said work holder comprising a screw engaging said 50 work holder, a pinion thereon and a segment engaging the pinion.

In testimony whereof I affix my signature in presence of two witnesses.

LOUIS C. KOEHL.

Witnesses:

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F. E. GAITHER.