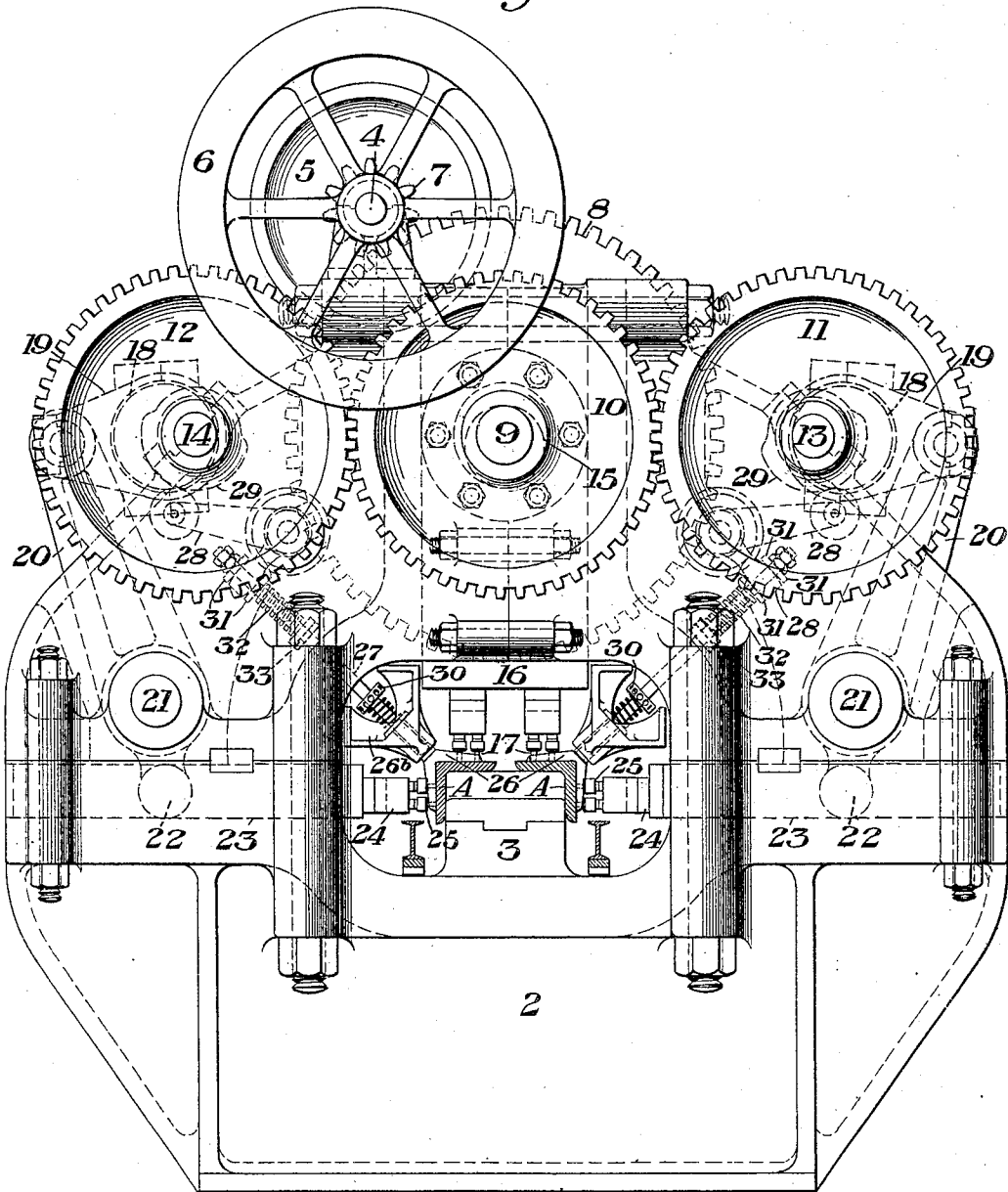


J. L. BERNARD.
PUNCHING MACHINE.
APPLICATION FILED APR. 15, 1909.

938,453.

Patented Oct. 26, 1909.
3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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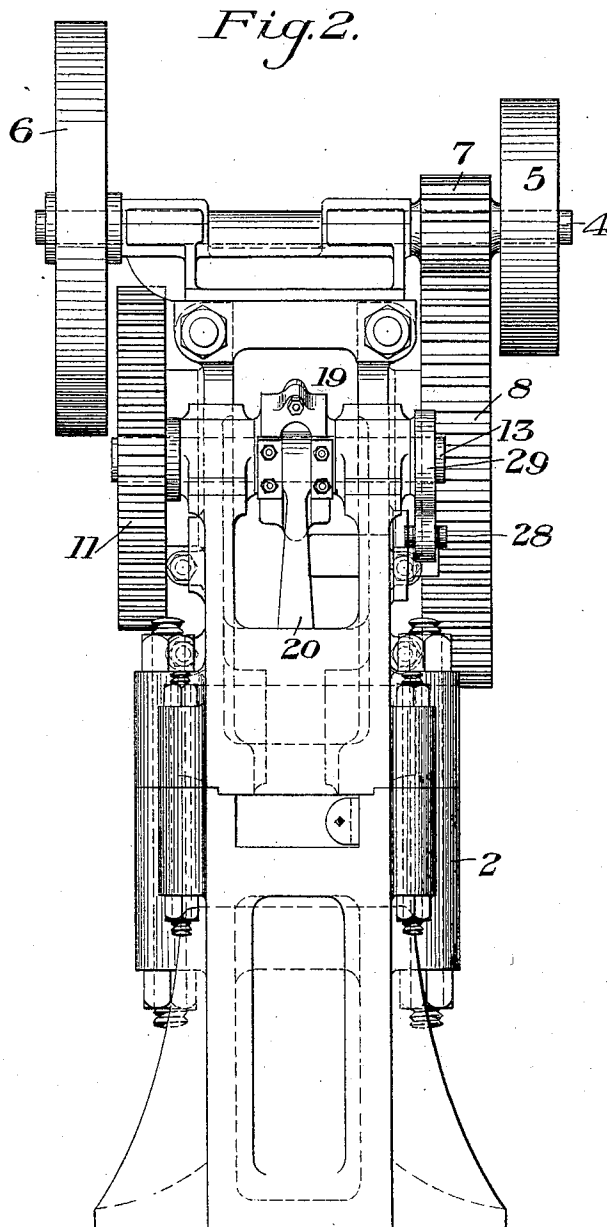
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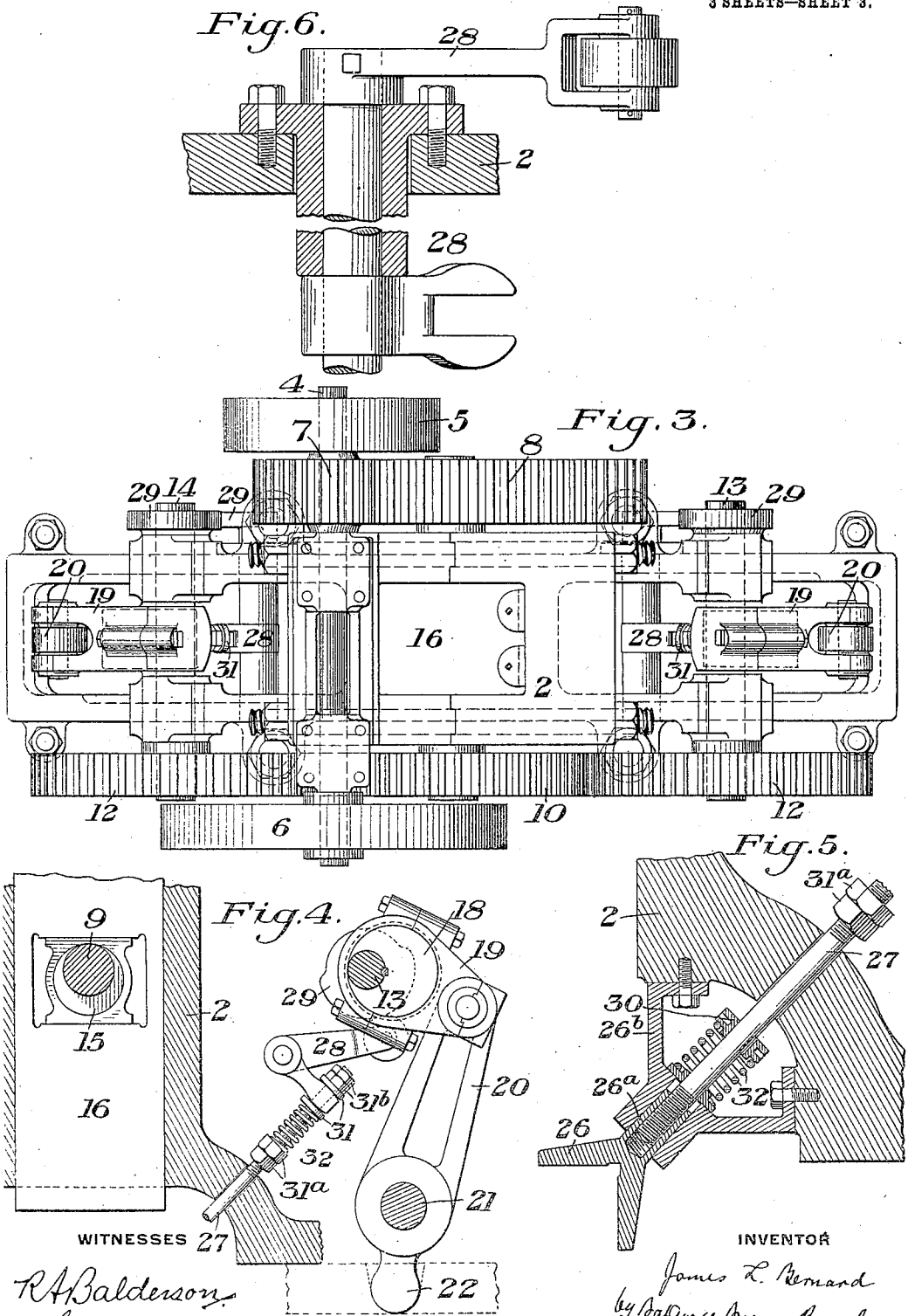
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

JAMES L. BERNARD, OF AMBRIDGE, PENNSYLVANIA.

PUNCHING-MACHINE.

938,453.

Specification of Letters Patent.

Patented Oct. 26, 1909.

Application filed April 15, 1909. Serial No. 490,138.

To all whom it may concern.

Be it known that I, JAMES L. BERNARD, of Ambridge, Beaver county, Pennsylvania, have invented a new and useful Improvement in Punching-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side view of a punching machine embodying my invention, Fig. 2 is an end view, and Fig. 3 is a plan view; and Figs. 4, 5 and 6 are sectional detail views showing the clamping mechanism.

My invention has relation to the class of punching machines, and more particularly to a punching machine designed for use in punching angles, the machine having a plurality of punching heads working in different directions and arranged to simultaneously punch different legs or flanges of the angles. I also preferably so construct the machine that at least two angles, or the three members of a channel section, may be simultaneously punched.

The precise nature of my invention will be best understood by reference to the accompanying drawings, in which I have shown the preferred embodiment thereof, it being premised, however, that various changes can be made in the details of construction and arrangement of the parts without departing from the spirit and scope of my invention as defined in the appended claims.

In these drawings, the numeral 2 designates the frame of the machine, which may be of any suitable character or construction, and which carries the punching anvil 3 upon which the angles or other shapes to be punched are supported, as clearly shown in Fig. 1.

4 designates the driving shaft, which carries a driving pulley 5 at one end and a fly wheel 6 at the opposite end.

7 is a pinion mounted on the shaft 4 and meshing with a relatively large gear wheel 8 secured to a central shaft 9. The shaft 9 also carries a gear wheel 10 which meshes at opposite sides with gear wheels 11 and 12, which are mounted upon the respective side shafts 13 and 14. The shaft 9 has a cam or eccentric 15, which actuates a vertical punching head 16. In the machine shown, this head is shown as provided with four punches 17 arranged in two pairs or sets, each pair

or set being arranged to punch the horizontal leg or flange of one of two angles A. The side shafts 13 and 14 each carry an eccentric 18, the straps 19 of which are connected to levers 20 pivoted to the frame 2 at 21 and having short arms 22 which engage and actuate horizontally sliding punch carriers 23 having each a punching head 24 at its inner end. In the present instance each of these punching heads is shown as provided with two punches 25. These punches 25 are arranged to punch holes in the vertical legs of the angles A, as clearly shown in Fig. 1.

26 designates combined holding-down and stripping plates, one of which is provided for each of the angles A and is arranged to engage the same and hold it down to the anvil 3. These stripping pieces are each provided with square projections 26^a which work in guides 26^b secured to the frame 3. These projections 26^a are internally threaded to receive the threaded end portion of rods 27, which slide obliquely in suitable guides on the frame. Secured to each of these rods between the guides for the projections on the plates and the rod is a collar 30, having a series of orifices in the periphery thereof for the insertion of a rod to rotate the rod 27, and surrounding the rod 27 between the guide 26^b and the collars 30, are springs 32, which normally hold the plates 26 out of contact with the bars A.

The rods 27 are actuated by bell crank levers 28. Each bell crank lever 28 is actuated by a cam or eccentric 29 on one of the side shafts 13 or 14, and their movements are so timed that they will force the angles to be punched against the anvil or die block and place them to gage and hold them in this position until the punch has passed through the material and is stripped therefrom during the withdrawal of the punch. Each of the rods 27 is made adjustable as to length so as to adapt the holding and stripping plates 26 to different thicknesses of material by means of the screw-threaded engagement between their ends and the plates 26. The arms of the bell cranks 28 engage the upper ends of the rods 27 by means of the collars 31 on the rods, one of said collars being seated against a spring 32, the other end of which is seated against the nuts 31^a, the other collars bearing against nuts 31^b. These springs are for the purpose of preventing injury to the

parts due to undue pressure which may be caused by the material being punched not being perfectly straight or true, permitting the plates 26 to adjust themselves to the material, and to be held in contact by means of the springs 32.

While I have illustrated the machine as punching the two separate angles A of similar form, it will be readily understood that these two angles may be of different sizes and sections, the two rods 27 being in that case separately adjusted thereto, if necessary; also that instead of the two angles, the material being punched may be a single piece of channel or plate form.

The details of construction and arrangement of the several punches and punching heads may be of any well known character, as may also the operating mechanism therefor, that shown being illustrative only. Each punching head may be provided with only one punch, or with more than two punches; these punches can be arranged to be set in different positions, and various other changes may be made in the details of construction and arrangement in a manner well understood in the art, without departing from the spirit and scope of my invention as claimed.

What I claim is:—

1. A machine for punching angles, comprising a relatively fixed die or anvil having surfaces for simultaneously supporting two angles to be punched, a plurality of punching heads arranged at different angles to the said die or anvil, combined holding and stripping members arranged each to engage two faces of one of the angles to be punched, and gearing for simultaneously actuating all the punching heads, substantially as described.

2. A machine for punching angles, comprising a relatively fixed die or anvil, a punching head arranged at each side of the die or anvil, another punching head above the die or anvil, combined clamping and stripping members arranged to engage both members of the angles to be punched, gearing for simultaneously actuating the punching heads, and means for actuating the clamping and stripping members in time relation to the operations of the punching heads, substantially as described.

3. A machine for punching angles, comprising a relatively fixed die or anvil having surfaces for simultaneously supporting two angles to be punched, a plurality of punching heads arranged at different angles to the

said die or anvil, combined holding down and stripping devices arranged to hold the angles to be punched in both a horizontal and a vertical direction, and means for actuating said devices in time relation to the operation of the punching heads; substantially as described.

4. A machine for punching angles, comprising a relatively fixed die or anvil, a plurality of punching heads arranged at different angles thereto, a combined holding down and stripping device arranged to engage and hold the angles in both a vertical and a horizontal direction, and gearing for positively actuating said device into and out of holding position; substantially as described.

5. A machine for punching angles, comprising a relatively fixed die or anvil, a plurality of punching heads arranged at different angles thereto, a combined holding down and stripping device arranged to engage and hold the angles in both a vertical and a horizontal direction, and gearing for positively actuating said device into and out of holding position, said device having a yieldable element whereby it may yield to inequalities or irregularities of the material being punched; substantially as described.

6. A machine for punching angles, comprising a die block or anvil, a plurality of reciprocating punching heads arranged to operate at different angles to the said block or anvil, gearing for actuating said heads, a holding-down device at each side of the block or anvil, an adjustable rod or carrier for each device, and means for actuating said rods or carriers; substantially as described.

7. A machine for punching angles, comprising a die block or anvil, a plurality of reciprocating punching heads arranged to operate at different angles to the said block or anvil, gearing for actuating said heads, a holding-down device at each side of the block or anvil, an adjustable rod or carrier for each device, and means for actuating said rods or carriers, together with means for permitting said holding-down devices to yield to inequalities or irregularities of the material being punched; substantially as described.

In testimony whereof, I have hereunto set my hand.

JAS. L. BERNARD.

Witnesses:

GEO. B. HANNUM,
H. R. LUKENS.