L. C. KOEHL.

PUNCHING AND SHEARING MECHANISM.

APPLICATION FILED OCT. 9, 1912.

1,091,668. Patented Mar. 31, 1914.

2 SHEETS—SHEET 1.

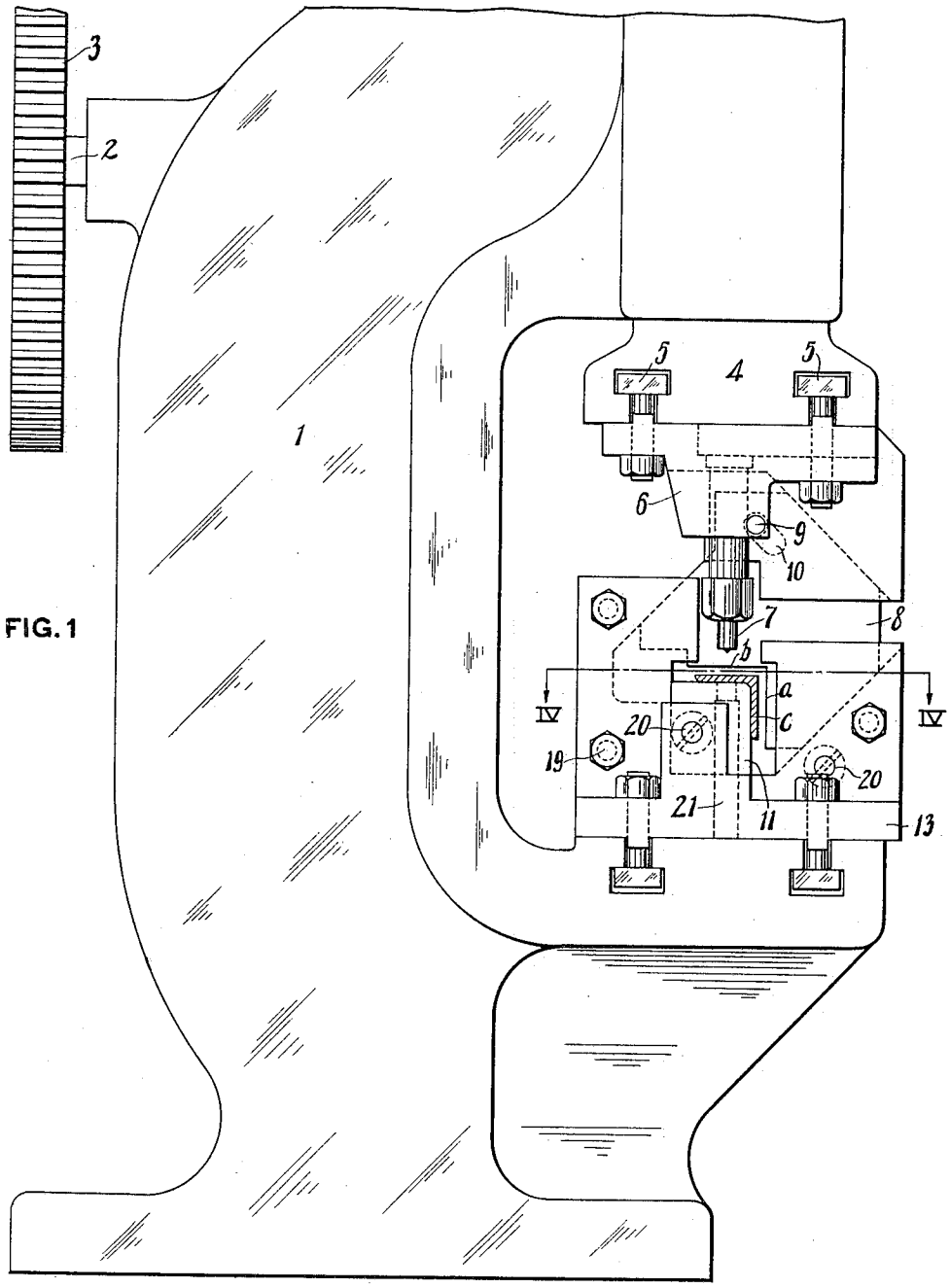


FIG. 1

WITNESSES

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2 SHEETS—SHEET 2.

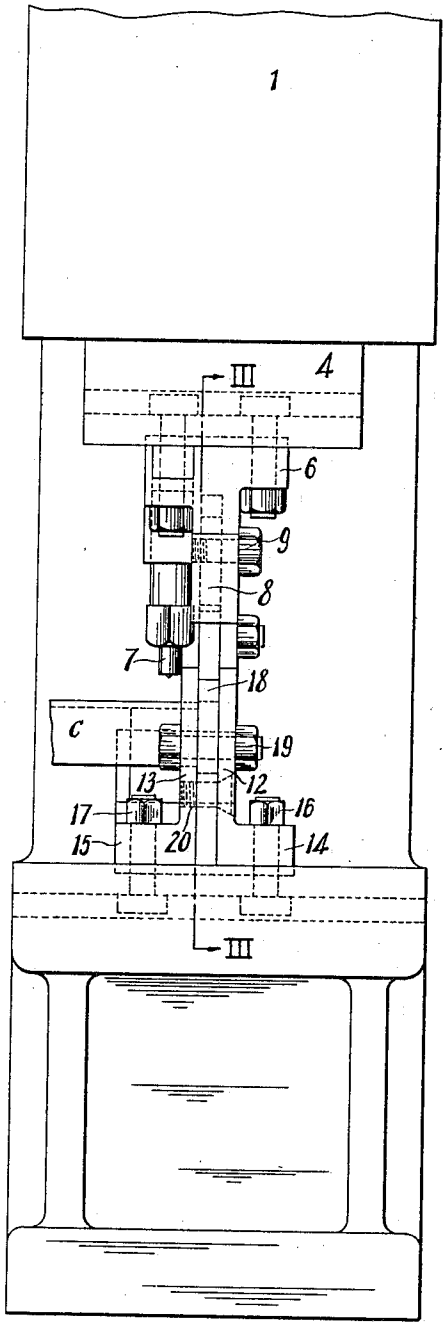
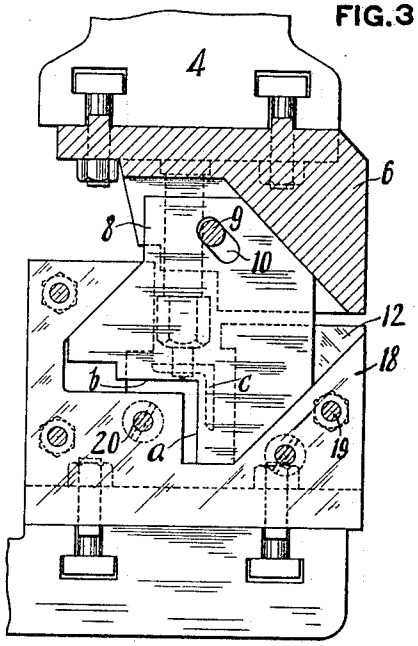


FIG. 2

FIG. 3



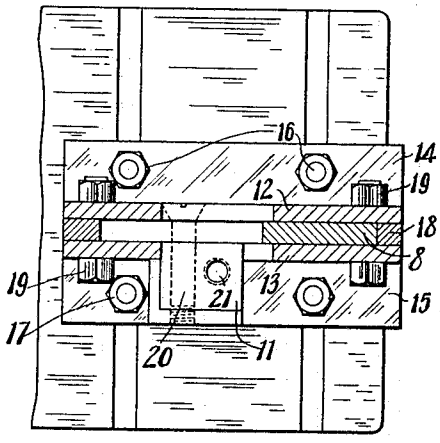


FIG. 4

WITNESSES

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UNITED STATES PATENT OFFICE.

LOUIS C. KOEHL, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO RITER-CONLEY MANUFACTURING COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

PUNCHING AND SHEARING MECHANISM.

1,091,668. Specification of Letters Patent. Patented Mar. 31, 1914.

Application filed October 9, 1912. Serial No. 724,707.

To all whom it may concern:

Be it known that I, LOUIS C. KOEHL, a citizen of the United States, of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Punching and Shearing Mechanism, of which the following is a specification.

This invention relates to metal punching and shearing machines, and an object of the present invention is to provide a combined shear and punch mechanism, particularly designed for shearing off both legs of an angular metallic member and punching a hole or holes in a leg of the angle.

A further object of the present invention is to provide a new and improved punch and shear mechanism of the character mentioned operable to effect a cutting or shearing of the two legs of an angle and punching a hole or holes in a leg thereof at a single stroke or without changing the position of the angular member operated upon.

In the accompanying drawing, which illustrates an application of my invention, Figure 1 is a side elevational view of a punching and shearing mechanism embodying my invention; Fig. 2, a front elevational view; Fig. 3, a part side elevational view and a part sectional view, the section being taken on line III—III of Fig. 2; and Fig. 4, a part plan and a part horizontal section, the section being taken on line IV—IV of Fig. 1.

In the drawings, I have shown my invention in connection with a well known form of punching and shearing machine and as the present invention relates to apparatus or tools to be employed therewith and not to any particular punch or shear machine, I deem it unnecessary to show more than the outline of such a machine.

Referring to the drawings, 1 designates a housing of a punching and shearing machine, and 2, an operating shaft driven by means of a gear wheel 3 coupled up to driving mechanism, not shown, in the usual manner, and 4 a vertically movable head-block of the usual and well known construction.

Secured to the vertically movable head-block 4 by means of bolts 5, I provide a combined punch and knife holder 6. This holder 6 is designed to move with the head block and to carry a punch 7 and a shear knife 8. The shear knife 8 consists of an irregularly shaped body having cutting edges *a* and *b* designed to simultaneously cut the two legs of an angle piece, as *c*. This knife is supported by and secured to the holder by means of a bolt 9, which latter is passed through the holder and through an elongated slot 10 of the knife. Slot 10 is disposed at an angle with the axial line of movement of the vertically movable punch, and it will be noted that the vertically reciprocating movement of the holder 6 will impart a lateral movement to the knife and cause it to approach and recede from the angular piece *c* to be punched and sheared.

As shown, the angular piece *c* is located on a die-block 11. Die-block 11 is disposed in a die holder comprising members 12 and 13, each respectively provided with base portions 14 and 15, and secured to the housing of the punch and shearing machine by bolts 16 and 17. Interposed between the vertically extending portions of the two-part die holder, I provide a filler or knife guide 18. The filler 18 and the upright portions of the respective parts constituting the separable die holder are secured together by a series of horizontally extending bolts 19, and the die-block 11 is secured to the die holder by means of a bolt 20.

In operation, a piece to be punched and sheared, usually an angular member as *c*, is placed upon the die-block in a position particularly shown by Fig. 1 of the drawings. While in this position, the vertically reciprocating tool holder descends causing the punch to pass through the angle *c*, and the cutting edges of the knives to be moved laterally against two legs of the angular piece *c* thereby effecting at a single downward stroke of the tool holder a punching and shearing of the article and without changing the position of the angular member being operated upon. The die-block 11 is provided with an opening 21 to receive the punch point after it penetrates the article being punched.

What I claim is:—

1. In a punching and shearing mechanism, a reciprocating tool holder, a punch carried thereby, and a laterally movable knife pivotally secured to the tool holder.

2. A punching and shearing mechanism

comprising a reciprocating tool holder, a vertically reciprocating punch carried thereby, a laterally movable knife having a slot disposed at an angle with the axis of the punch, and a pin entered in the slot and secured to the tool holder.

3. A punching and shearing mechanism comprising a vertically reciprocating tool holder, a punch carried thereby, a knife movable with the tool holder, and means for imparting a lateral movement to the knife during the vertical movement of the tool holder.

4. A punching and shearing mechanism comprising a vertically operable punch, a laterally movable knife, a reciprocatory holder for said members, a die holder, a die-block located therein, said die holder having an inclined guideway for the laterally movable knife.

5. A punching and shearing mechanism comprising a reciprocatory tool holder, a punch rigidly connected to the tool holder, a shearing knife, and means on the tool holder for imparting a lateral movement to the knife upon the reciprocation of the tool holder.

6. A punching and shearing mechanism comprising a tool holder, a punch rigidly connected to the tool holder, a shearing knife, and a connection between the tool holder and knife to cause the knife to have a lateral movement across the path of movement of the punch.

7. A punching and shearing mechanism comprising a tool holder, a punch rigidly connected to the tool holder, a shearing knife, and a connection between the tool holder and the knife to cause the knife and punch to move at intersecting planes.

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

LOUIS C. KOEHL.

Witnesses:
F. E. GAITHER,
ROBERT F. MCCLOSKEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."