No. 648,703. Patented May 1, 1900.

J. G. McDOWELL.

METAL SHAPING DIE.

(Application filed Aug. 24, 1899.)

(No Model.) 2 Sheets—Sheet 1.

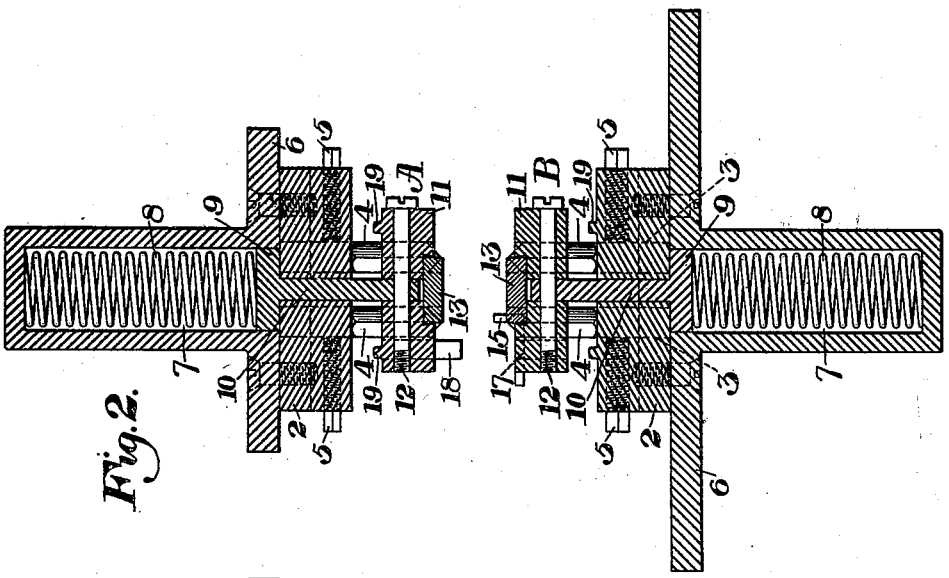

Fig. 2.

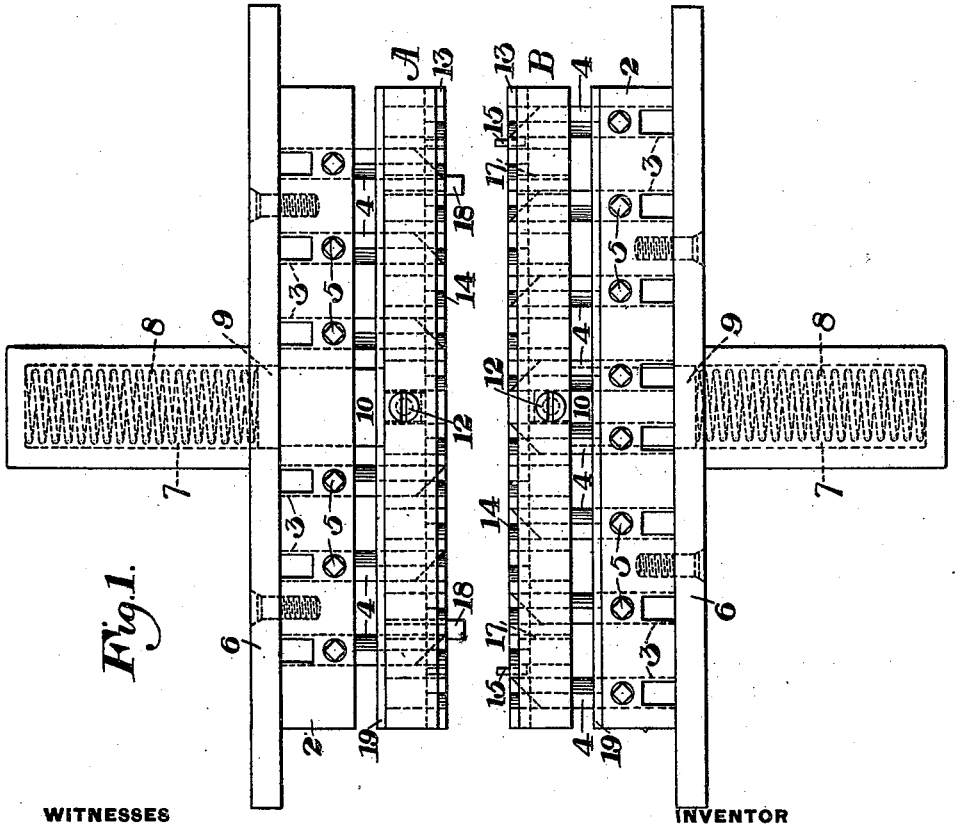

Fig. 1.

WITNESSES

Warren W. Swartz

T. M. Redman

INVENTOR

J. G. McDowell

by Baldwin & Baldwin

his attys.

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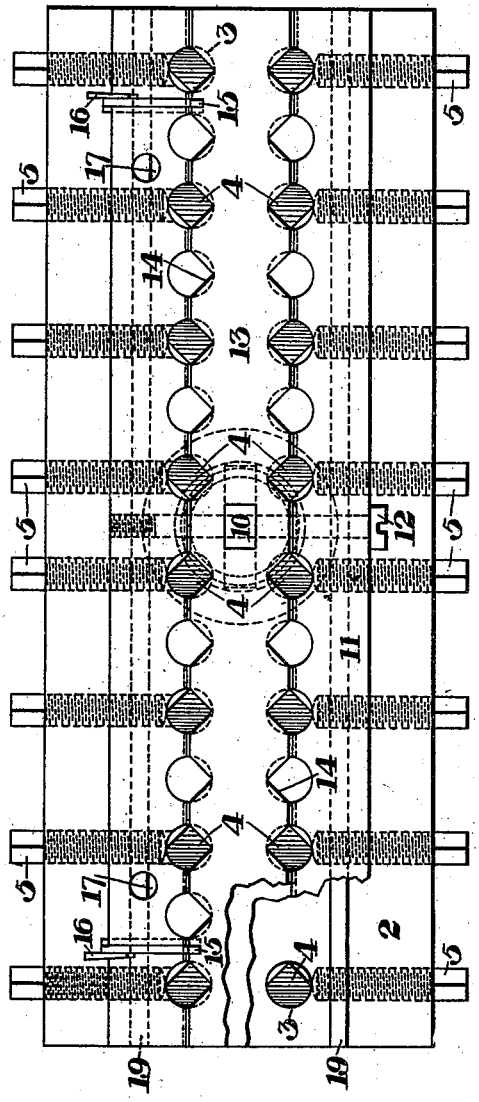
(No Model.) 2 Sheets—Sheet 2.

Fig. 3.



WITNESSES

Warren W. Swartz
L. M. Redman

INVENTOR

J. G. McDowell
by Bakewell & Bakewell
his atty's.

UNITED STATES PATENT OFFICE.

JOHN G. McDOWELL, OF PITTSBURG, PENNSYLVANIA.

METAL-SHAPING DIE.

SPECIFICATION forming part of Letters Patent No. 648,703, dated May 1, 1900.

Application filed August 24, 1899. Serial No. 728,310. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. McDOWELL, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Metal-Shaping Dies, 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 elevation of a pair of dies constructed in accordance with my invention. Fig. 2 is a central vertical cross-section of the same; and Fig. 3 is a plan view, partly broken away, of the lower die.

My invention relates to the punching or shaping of sheet metal, and more particularly to the forming of sheet-metal articles from which projections are struck up in opposite directions; and its object is to provide a simple and effective die system which at a single stroke will punch or strike up both upward and downward projections from the sheet-metal blank acted upon.

In the drawings, in which I show my invention as applied to the making of wall-ties such as shown in my Patent No. 620,349, dated February 28, 1899, A is an upper reciprocating die, and B a lower stationary die. As these dies are the same in construction, I will describe the stationary one, similar numerals being applied to corresponding parts of the other.

In the lower die B, 2 is a base-block, provided on each side of its center with a longitudinal series of cylindrical holes 3, containing punches 4, secured by means of set-screws 5, by which their position may be regulated. This base-block is secured to a backing-plate 6, having a central recess 7, containing a spiral spring 8, acting upon a plunger 9. This plunger is provided with a central rectangular lug or post 10, which projects upwardly through a similarly-shaped slot in the base-block, and to the post is secured a die-block 11, having a series of round holes therethrough, part of which register with the holes in the base-block, this block 11 being held by a screw-bolt 12. A clamping and shearing plate or projection 13 is secured centrally to the block 11, preferably by dovetailing, as shown in Fig. 2, and this plate is provided with angular notches 14, which register with the round holes in the shearing-block. To prevent longitudinal movement of the plate 13, I provide pins 15, which enter notches in such plate and are secured by keys 16. The block 11 is provided with guiding-holes 17 to receive pins 18 upon the block 11 of the other die, so as to keep the dies in proper alinement during the stroke. The punches of the upper reciprocatory die are arranged alternately with those of the lower die, so that they will enter those holes of the lower die which alternate with the holes entered by the lower-die punches. To prevent scale or dirt, which may lodge on the upper-die block or lower base-block, from changing the extent of movement of the die-block, I form teats or projections 19 upon the lower base-block and the rear of the upper-die block. Any scale dropping on these parts will lodge between the projections and not interfere with the proper movements.

The operation is as follows: A blank or strip of sheet metal being laid in proper position upon the lower plate 13, the upper die is moved downwardly. The upper plate 13 first contacts with the blank and clamps it between these two plates. As the motion continues the plungers are pressed backwardly into their cylinders and the punches of the upper die coact with the notched portions of the lower shearing-plate to cut and bend downward projections, while the punches of the lower die have a corresponding action coöperating with the registering notches of the upper plate to form upward projections. These plates 13 are of tempered steel, and their notched portions coact with the angular portions and the punches to shear and bend the edge portions of the blank. As the upper die again rises the plates 13 move forward over the punches and act to strip the blank therefrom, which will rest by gravity on the lower plate and may be removed and another inserted.

The advantages of my invention result from the formation of oppositely-extending projections or struck-up portions at a single stroke of the press and by means of a simple construction of dies which are not liable to get out of order.

Many variations may be made in the form and arrangement of the punches, as well as

in the other parts, without departing from my invention.

I claim—

1. In shaping-presses, a pair of dies, each having shaping-punches and a movable plate having holes to receive the punches, each of said plates also having holes or recesses to receive the punches of the other die; substantially as described.

2. A pair of dies, each having punches, and each having a movable member arranged to receive the punches of both sets of dies; substantially as described.

3. A die having punches, a spring-supported plate having holes receiving the punches, and a coöperating die having punches, the spring-pressed plate having holes to receive the punches of the opposite die; substantially as described.

4. A pair of dies, each having punches and each having a movable member containing holes or recesses for receiving both sets of punches, said members having projections arranged to clamp the blank; substantially as described.

5. A pair of dies having projecting punches, spring-supported plates having holes for the punches, and projecting clamping-plates secured to the movable plates and having shearing edge portions to coact with the punches of the opposite die; substantially as described.

6. A pair of shaping-dies, each having a movable plate or member and projecting lugs arranged to limit the movement of the movable plates; substantially as described.

In testimony whereof I have hereunto set my hand.

JOHN G. McDOWELL.

Witnesses:
M. S. MURPHY,
G. B. BLEMMING.