

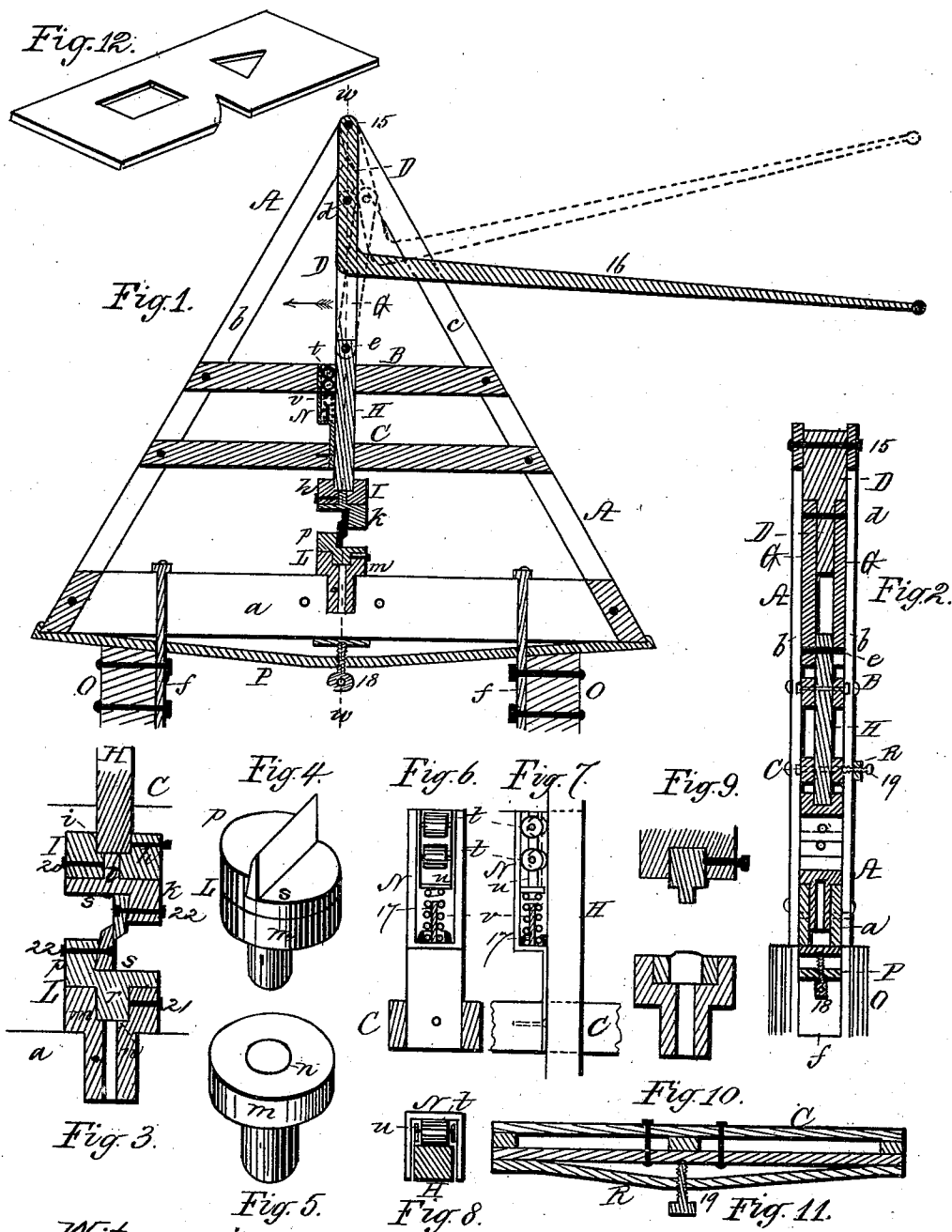
(No Model.)

P. MIDDGAUGH.

MACHINE FOR CUTTING, SHEARING, PUNCHING, AND EMBOSsing METAL

No. 580,986.

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UNITED STATES PATENT OFFICE.

PETER MIDDAUGH, OF TAMPA, FLORIDA.

MACHINE FOR CUTTING, SHEARING, PUNCHING, AND EMBOSsing METAL.

SPECIFICATION forming part of Letters Patent No. 580,986, dated April 20, 1897.

Application filed July 10, 1896. Serial No. 598,694. (No model.)

To all whom it may concern:

Be it known that I, PETER MIDDAUGH, of Tampa, Hillsborough county, Florida, have invented Mechanism for Cutting, Shearing, Punching, and Embossing Metal or other Materials, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a longitudinal vertical section through the center of my said mechanism with the frame in which it is located. Fig. 2 is a transverse vertical section in the direction of the line *ww* of Fig. 1. Fig. 3 is a vertical section (enlarged) through the tool-holders and tools with the plunger and parts immediately connected therewith. Figs. 4 and 5 are perspective views of a tool-holder composed of two portions and a cutting-tool secured in its working position. Figs. 6, 7, and 8 represent (enlarged) a device for relieving the friction of the plunger in its descent. Figs. 9 and 10 represent the two portions of a punch and their holders. Fig. 11 shows the two bars of the lower cross-tie with a section of the plunger between and a brace and set-screw for preventing the lateral play of the same. Fig. 12 is a detail view of a metal plate, showing different-shaped pieces cut therefrom.

My invention relates to the several operations of cutting, shearing, punching, and embossing metal and other materials, which usually or frequently require the employment of separate or independent machines for the different classes of work to be performed; and this invention consists in a single organized mechanism adapted to interchangeably receive cutters, punches, and embossing-tools of various styles and sizes and capable of successively performing their respective functions in a rapid, convenient, and efficient manner; and this invention also consists in a frame whose construction is peculiarly fitted to receive the mechanism which operates the aforesaid tools and which will be hereinafter described and claimed.

In the said drawings, A is a frame of triangular form, preferably equilateral or isocetes, and having each of its sides *a b c* composed of a pair of parallel metal bars having a space between them, the bars of the lower side or bed *a* of the frame being of greater depth and

their ends being bolted within the space between the lower ends of the sides *b c*.

B are two horizontally-arranged cross-ties having their ends also bolted between the bars of the sides *b c*, each cross-tie being formed of a pair of parallel bars separated from each other, the space between them being occupied by a filling or backing of wood. In the space between the bars at the vertex or junction of the tops of the two inclined sides *b c* is pivoted at 15 the upper end of a solid arm D, provided with a long handle 16, said arm being of reduced width at its lower end, to which at *d* are pivoted the tops of the two separated bars which constitute a link G, the outside of said bars being located flush with the outer surface of the upper or enlarged portion of the arm D. Within the lower ends of the bars of the link G is pivoted at *e* a solid plunger H, which in its normal position is vertical or substantially so.

I is the movable tool-holder, which is firmly but adjustably secured to the foot of the plunger by a set-screw, the bottom of the plunger extending down into the holder.

L is the stationary tool-holder, which is firmly located on the tops of the two bars which constitute the bed *a* of the frame, the shank of this holder extending down between them and being held securely by a set-screw, the permanency of the holder on its seat being still further insured by a bolt passing through the bars in a transverse direction on each side of said shank, by which the bars are tightly clamped against it.

Each tool-holder is composed of two portions, the upper or movable tool-holder I of a portion *h*, provided with a cylindrical socket *z*, (see Fig. 3,) and a portion *k*, provided with a cylindrical shank *l*, which fits therein and is held in place when adjusted by a set-screw 20. The lower or stationary tool-holder L is composed of a portion *m*, also provided with a cylindrical socket *n*, and a portion *p*, having a cylindrical shank *r*, held therein by a set-screw 21. Each of the portions *k p* of the two tool-holders is furthermore provided with a shouldered abutment *s*, upon which its tool—for instance, a cutter, punch, or embossing-die—is firmly seated and held by an adjustable set-screw 22.

From the foregoing description it will be

understood that by loosening its screw the tool of each portion $k p$ may be readily removed therefrom and another tool of the same or different style or size substituted therefor, and, furthermore, that each portion $k p$ may be rotated to change the direction of a cutter when a different angle of cut is to be made on the sheet of metal presented to it.

I will now describe a device which I employ for relieving the friction of the plunger in its descent and as it is thrust slightly forward in the direction of the arrow, Fig. 1, by bringing down the operating-handle.

N is a metal casing, of the form seen in Figs. 6, 7, and 8, whose top abuts against the wooden filling located within the bars of the upper cross-tie B , to which it is secured, its bottom being secured to the wooden filling in the space between the bars of the lower tie C . This casing is open on the side toward the plunger, which fits loosely therein and bears, when descending, against the peripheries of two rolls $t t$, mounted in a frame u , which rests upon a spiral spring v thereunder, said spring being held in position by an upright guide 17, which projects up from the casing into the space between the coils, this arrangement permitting the frame to yield and the rolls to revolve when the plunger is brought down into contact with them. The triangular frame may be supported by a pair of strong posts O , upon which it is firmly held by metal straps f , which project up into the space between the bars of the bed a of the frame and have screw-nuts turned over their upper ends. (See Figs. 1 and 2.)

P is a metal brace provided with a set-screw 18, which prevents any tendency of the bed to be deflected downwardly on pressure being applied during the performance of the work, Figs. 1 and 2.

Fig. 11 represents a metal brace R , whose ends bear against the ends of one of the pair of bars of the lower cross-tie C . This brace is provided with a set-screw 19, which is adjusted to bear against said bar in order to keep the face of the upper or movable cutter snugly against the face of the stationary cutter when a thin metal plate is being acted on, for if the cutters were not snugly and firmly held together a thin plate would have a tendency to be tipped up and be wedged between them.

A pair of cutters located in and operated by a mechanism of my aforesaid construction

are capable of cutting out different-shaped pieces, either straight or curved, at or away from the center of a metal plate or from either of its edges, (see Fig. 12,) it being simply necessary to feed the edge or other portion of the plate under and directly in line with the movable cutter and turn the plate by hand in the direction required for making the cut of the desired form and size.

I claim—

1. In a shearing, punching and embossing machine; a frame A of triangular shape having sides $a b c$ and cross-ties $B C$ connecting the opposite-inclined sides $b c$, each side and each cross-tie being composed of a pair of parallel-arranged and separated bars, in combination with and for locating within the space between said bars; the following instrumentalities, viz., an arm D pivoted directly to said frame at or near its top and having the lower portion of its opposite sides reduced or cut away, an operating-handle 16 extending therefrom, a link G composed of two parallel-arranged bars pivoted to and on opposite sides of said reduced portion of the arm D , a plunger II , composed of a single piece pivoted at its upper end to and between the lower ends of the link-bars, a movable tool-holder secured to the foot of the plunger and a stationary tool-holder supported by the bars composing the base a of the frame, all constructed and arranged to operate substantially as described.

2. The combination with a triangular frame and a mechanism adapted to receive and operate interchangeable tools, of a device for relieving the friction of the plunger in its descent; said device consisting of one or more rolls t a frame u in which they are mounted, a spring v located under the roll-frame and a casing for inclosing said frame and the cross-ties $B C$ to which the casing is secured, substantially as set forth.

3. In a shearing, punching and embossing mechanism, a triangular frame A having each side formed of a pair of parallel-arranged metal bars separated from each other in combination with cross-ties $B C$ and braces P, R with their adjustable screws 18, 19, as described.

Witness my hand this 2d day of July, 1896.

PETER MIDDLEAUGH.

In presence of—

N. W. STEARNS,

A. F. STEARNS.