No. 765,486. PATENTED JULY 19, 1904.

D. M. HUMISTON.

DIE PRESS FOR MAKING GLAZIERS' POINTS.

APPLICATION FILED SEPT. 16, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

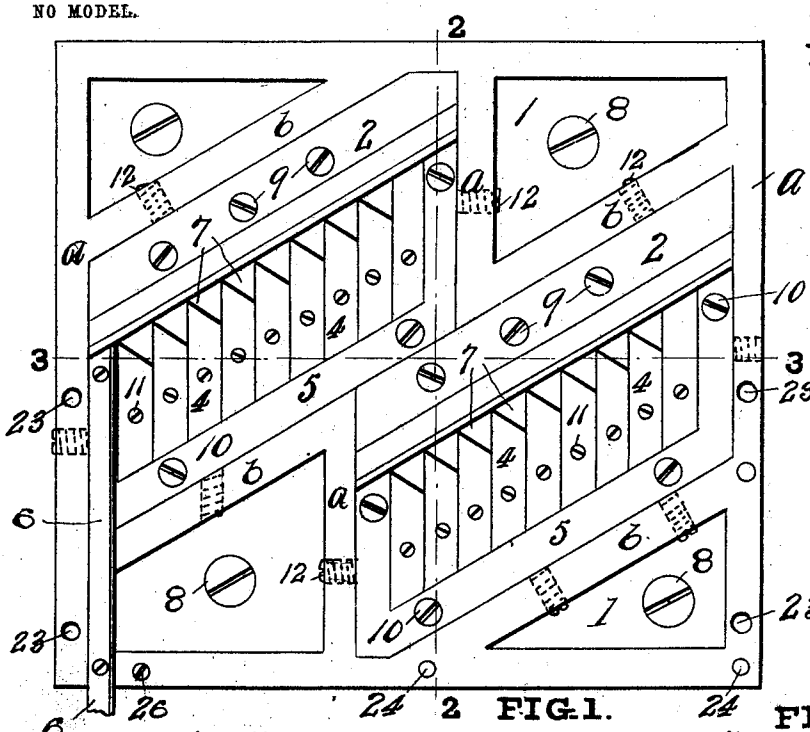


FIG. 1.

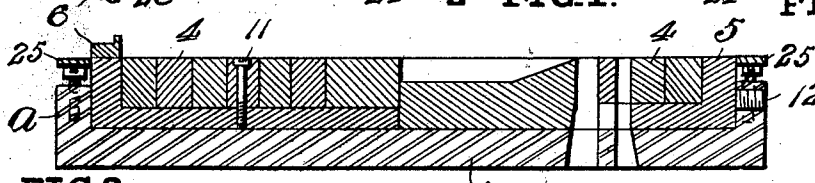


FIG. 3.

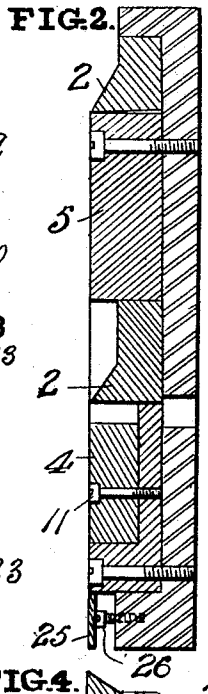


FIG. 2.

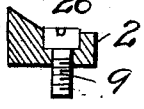


FIG. 4.

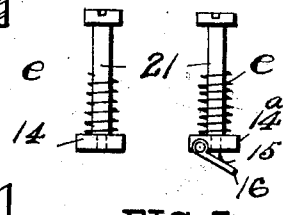


FIG. 5

FIG. 7.

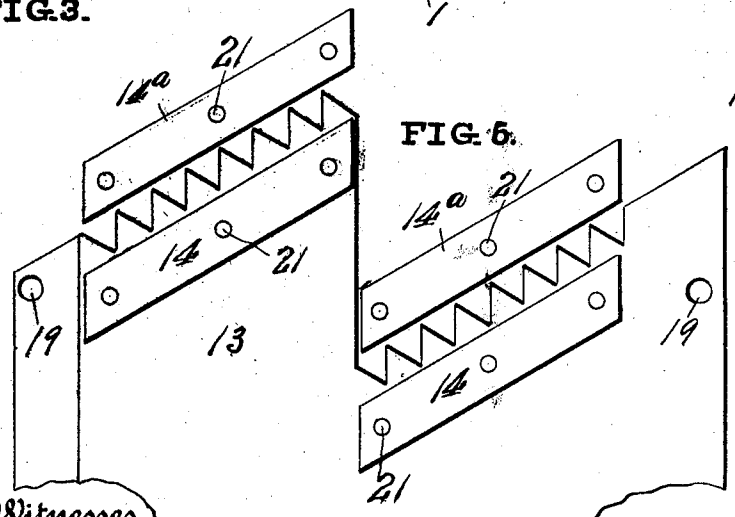
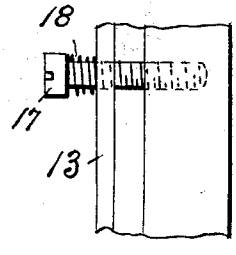


FIG. 6.



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FIG. 8.

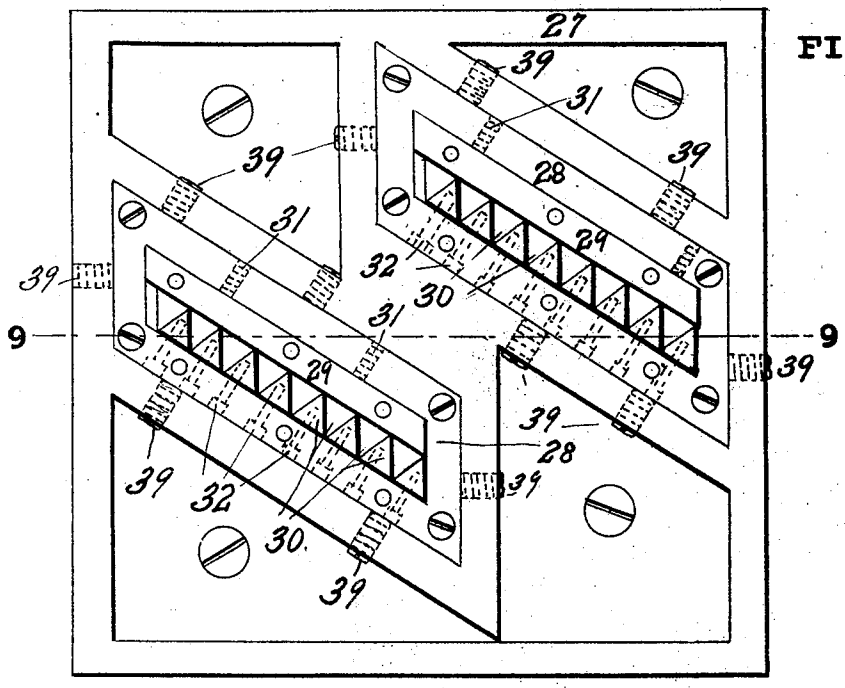


FIG. 9

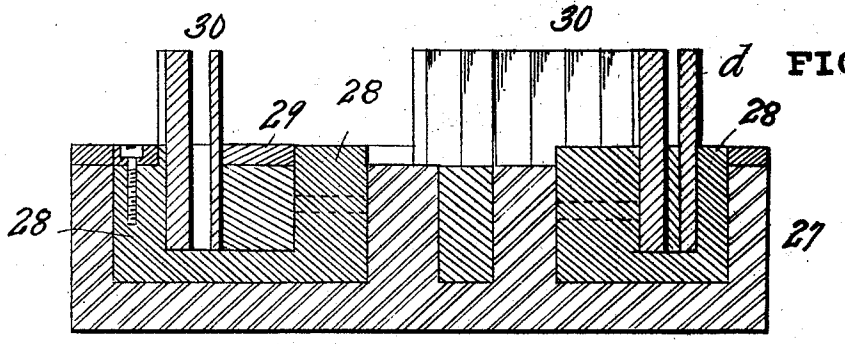


FIG. 11.

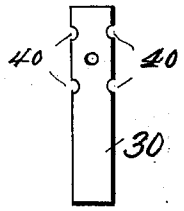
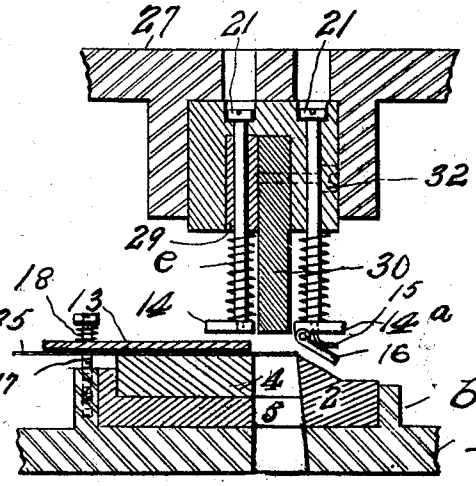


FIG. 10.



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No. 765,486. Patented July 19, 1904.

UNITED STATES PATENT OFFICE.

DAWSON M. HUMISTON, OF AURORA, ILLINOIS.

DIE-PRESS FOR MAKING GLAZIERS' POINTS.

SPECIFICATION forming part of Letters Patent No. 765,486, dated July 19, 1904.

Application filed September 16, 1903. Serial No. 173,442. (No model.)

To all whom it may concern:

Be it known that I, DAWSON M. HUMISTON, a citizen of the United States, residing at Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Die-Presses for Making Glaziers' Points, of which the following is a specification.

This invention relates to machines for cutting or punching glaziers' "points" from sheets of thin metal.

The object of the invention is to produce a machine by which small triangular or polygonal pieces of metal, like the well-known glaziers' points, may be cut or punched in large numbers from a sheet of metal with each reciprocation of a punching-die; also, to make the machine adjustable or variable for various sizes of points and to adapt a machine to the production of points of various sizes by simple changes of tools; also, to provide the various necessary auxiliaries for the successful operation of the main parts of the machine.

The invention consists in the constructions of elements and combination of parts hereinafter described, and particularly pointed out in the claims.

Figure 1 is a top plan of a die-shoe, showing dies in position and other details of what may be called the "bed" of the machine, but with the stripper-plate removed. Fig. 2 is a transverse section of Fig. 1 on the dotted lines 2 2. Fig. 3 is a longitudinal section on the line 3 3, Fig. 1. Fig. 4 is a cross-section of cutter, showing retaining-screw. Fig. 5 is a detail elevation showing shedders detached. Fig. 6 is a broken plan of stripper-plate and shedders. Fig. 7 is a broken elevation showing bed and stripper. Fig. 8 is a bottom plan view of the punch and punch-holders. Fig. 9 is a section of the same on line 9 9, Fig. 8. Fig. 10 is a broken section showing relation of punches and punch-carrier and adjuncts to the dies in the operation of punching out points. Fig. 11 is an elevation of a punch.

The machine may be considered a punching-press or is used in a press of suitable form, and, as shown, the punches and dies are adapted to cut triangular pieces or points from metallic sheets, which sheets are fed forward, preferably by a feeding mechanism adapted to move the sheet forward a predetermined distance with each stroke of the punches, although the sheet may be fed by hand.

As the mechanism of this invention is adapted for use with any one of several well-known punching-machines, it is deemed unnecessary to describe such a machine further than to state that the punching-frame is lifted after each punching stroke, which stroke leaves the edge of the sheet notched like a saw-blade. The sheet is then fed forward the length of a point, and the next fall of the punch-frame causes the punches to cut or punch from the plate a row of triangular pieces or points, the bases of these being directly behind and coterminous with the said "teeth," these punched triangles being points and their severance from the sheet severing also the first-mentioned teeth, which are thus made into points, and leaving the sheet again toothed for the production of more points.

Let the numeral 1 indicate a bed-plate of metal and preferably integral with a smooth upper surface, on which are the frame-bars *a*, parallel with the sides of the bed and extending upward therefrom, and the frame-bars *b* extending obliquely. The main body of the bed is thus divided into boxes of substantially rhomboidal outline, as many in number as desirable, according to the width of the sheet of metal to be operated on. The end of one rhomboidal box or compartment overlaps the end of the next, and owing to the oblique arrangement of these boxes they extend across the bed-plate in a broken zigzag line. In each box or compartment there is a die-frame 5, which is of such form as to fit neatly into the compartment, but having a frame or band which projects upward on three sides only, leaving the fourth side of the rhomboid open at its front, as illustrated.

Within the die-boxes a number of dies 4 are arranged. These dies have parallel sides and parallel upper and lower faces; but their

ends are beveled or inclined in opposite directions. When these dies are placed side by side in the die-boxes, as shown, the ends project from the front of the die-boxes like saw-teeth, as shown in plan in Fig. 1. The die-boxes are held to the bed by suitable attaching devices, as screws 10, and the dies are held to the die-boxes, as by screws 11. The die-boxes and the bed-plate are cut away below the spaces between the projecting ends or teeth of the dies, so that the points punched out between these ends of the dies by mechanism to be described may drop down through the bed. (See 7, Fig. 1.)

In front of the die-boxes and dies are the cutters 2, which are held to the bed by screws 9. The upwardly-projecting cutting edge of cutter 2 is in close proximity to the ends of the dies. Thus each cutter 2 and a series of dies form a number of triangular openings with sharply-defined edges.

While the die-boxes approximately fit the rhomboidal receptacles in the bed-plate, there is still room for a slight adjustment, and such adjustment is effected by set-screws 12, the openings through which screws 10 pass being sufficient to permit such adjustment or regulation. A gage 6 at one side of the bed is the base from which adjustment is made, this gage being the side guide against which the sheet-metal plate is held and along which it is fed forward.

A stripper-plate 13 lies above the dies and die-boxes and is held to the bed by screws 17, passing through holes 19 in the stripper-plate into threaded sockets 23 in the bed-frame. Springs 18 between the heads of these screws and the stripper-plate tend to press said plate downward. The front edge of the stripper-plate has notches or saw-teeth edges to correspond with the toothed ends of the dies, and these teeth lie directly above the dies. The sheet of metal operated on is interposed between the die-boxes and dies and the stripper-plate and when fed forward will project beyond the front notched edges of the dies and stripper-plate. The stripper-plate will yield upwardly against the pressure of springs 18 to some extent, but not sufficiently to let the sheet of metal rise substantially from the dies. The teeth of the stripper-plate extend between the punches when the punches (to be described) are down and prevent the punches from lifting the metal operated on or the points punched from it.

The bed is held by screws 8 to whatever base is used. That part of the bed in rear of the die-boxes is covered by plates 25, which plates, Figs. 2 and 3, are supported on the heads 26 of screws which enter threaded holes 24. Thus these plates may be lowered as the dies are ground away, and the surface over which the plate, which is the stock or blank, is fed remains smooth and level. The punch-head is the reverse of the die-bed and is so arranged that the triangular punches register with and enter the openings 7 between the dies and cutters. Fig. 9 shows the face of such a punch-head and the punches and holders.

27 indicates the punching-platen, in which are rhomboidal recesses for the punch-holders 28. These holders or boxes are rhomboidal in outline, and the triangular-bodied punches 30 are set therein with the flat sides against the boxes, and Babbitt metal is cast round them. A binding-piece 29 rests against the punches. This piece 29 is rhomboidal in outline and is held in place by a headed pin 21, passing through the punch-box from the back, and by screws 31 through the sides of the box. Each punch is held firmly in the punch-box by a screw 32, passing through the side of the punch-box into the body of the punch. The punches 30 are notched at 40 to receive the Babbitt metal and be held thereby.

The headed screws 21 support the shedders 14 in rear of the punches, and the shedders 14^a are in front of the punches. (The front is that end of the machine toward which the stock is fed.) The shedders 14 in rear of the punches and close against the punch-bodies are pressed down on the stripper-plate 13 by springs *e*, surrounding the pins and bearing against the shedder and the piece 29. The springs yield as the die falls, but expand and hold down the shedder and stripper when the punches rise. Fig. 10 shows the position of parts when the punches are about to fall. The shedder 14^a is supported in front of the dies, but similarly to the support of shedder 14. In addition the shedder 14^a has a pivoted finger or flap 16 on its under face, which finger or flap is pressed down by spring 15. The front shedder will overcome the tendency of the cut points to rise with the rising of the punches and will guide the points down the inclined upper faces of cutters 2.

The rhomboidal boxes or punch-holders are separately adjustable in their receptacles by screws 39.

Having described the principles of construction in the machine, the arrangement will be understood from Figs. 1 and 8. The punching-head 27 rises and falls, as is usual in die-cutters. The triangular punches 30 neatly fit the triangular spaces between the ends of the dies 4 and cutters 2 when the punches fall. Now suppose a sheet of zinc 35 to be fed forward while the dies are on the upstroke. The feed may be so far before the first stroke of the punch that the most advanced die is covered by the sheet or stock. Then when the punch-head falls all the punches punch out triangles or points from the plate, leaving the front edge of the plate notched like saw-teeth and these teeth arranged in oblique sections, each section having as many teeth as the number of dies in the die-box and the

number of sections being equal to the number of die-boxes on the bed. (The number of punches and punch-holders conforms, of course, to the number of dies and die-boxes, and the position is that of exact register.) After the front of the plate has been formed into teeth, as above stated, the punches lift, and the sheet is advanced the length of a point, so that the teeth overlap the edges of cutters 2 by just the length of the teeth or points. The punches then fall and punch out a series of points from the plate immediately in rear of these teeth, and the cutters at the same time cut off all the projecting teeth. The points punched out fall through openings 7, being prevented from rising by the stripper-plate, and the points or teeth cut off by the cutters being held down by strippers 14^a rest on the inclined upper faces of cutters 2, whence they fall by gravity. Thus after the front of the sheet is properly notched each fall of the punches produces two sets of points extending obliquely across the sheet.

I have shown a machine containing only two oblique sections; but this is unusual. The bed should contain a considerable number of obliquely-arranged die-boxes, so that each box should contain not more than twenty dies. The overlapping ends of the die-boxes insure the cutting of all the metal.

It is inadvisable to arrange a single set of dies and punches to extend entirely across a wide sheet for the reason that it is almost impossible to secure perfect alinement and register of so large a number of punches and dies, as the slightest inaccuracy is multiplied with increase of number; but by breaking the dies and punches up into sections, which may, if necessary, slightly overlap or may be spaced, it is feasible to secure accurate adjustment of each section and of the entire series.

The front cutters 2 are at the uniform angle of one hundred and twenty degrees from the line of the gage 6. The proximate sides of the dies are exactly parallel with the gage. The front of the dies are at one hundred and twenty degrees from this side. Consequently the points cut between these dies and cutter must be equilateral triangles; but the feed is in the line of the gage and parallel sides of the die and after the teeth are established is just the length of a point, and there is absolutely no waste of material, as the entire stock is cut into points.

I have not considered it necessary to point out such modifications as will occur to the skilled mechanic and which are within the scope of my claims.

It should be understood that the punch-holders and die-boxes are adjustable with great nicety. The punches and dies are removable and replaceable by others of different size. The feed will of course be regulated to conform to the size of the points.

What I claim is—

1. The combination with a punching-press having a side guide, of a plurality of point-making dies arranged in a continuous series oblique to said guide, and punches corresponding to the dies.

2. The combination, in a punching-press, of a series of point-cutting dies arranged in sections, one section containing a plurality of dies arranged obliquely and overlapping another section containing a plurality of dies.

3. The combination with a press-bed, of a series of die boxes or holders arranged obliquely across the bed, said boxes being separately adjustable.

4. The combination with a press-bed, of rhomboidal die-boxes arranged obliquely, and parallel-sided dies arranged side by side in said boxes.

5. The combination, in a punching-press, of rhomboidal die-boxes extending obliquely on the bed, parallel-sided dies in said boxes, and cutters at the front of said boxes and against the ends of the dies.

6. The combination with punches and dies, of the cutter having inclined upper surface, and the spring-pressed shedder above said cutter having a spring-flap.

7. The combination with a punching-press, of a plurality of series of dies, said series arranged on different lines across the press-bed, and together having a length equal to the distance across the press-bed on the line of either series.

8. The combination with the press-bed and dies, of a stock-supporting plate in rear of the dies, and means for vertically adjusting said plate as the dies are worn or ground away.

9. The die-press bed provided with dies and cutters for severing projecting teeth, and with apertures between the dies for conveying away points punched down between the dies.

10. The die-press provided with receptacles arranged obliquely, and means for separately adjusting die-boxes in said receptacles.

11. A punching-platen having separate receptacles for punch-holders arranged obliquely across the face thereof.

12 A punching-platen having rhomboidal receptacles for the punch-holders, in combination with rhomboidal punch-holders therein, and means for adjusting the punch-holders.

13. The combination with the rhomboidal punch-holders, of triangular punches arranged therein with flat faces against the side of the holder, and a filler between the punches.

14. The combination with a press-bed, of a number of point-cutting dies arranged in separate lines across said bed, one series overlapping another series but on a different line.

15. The combination with a press-bed, of a number of punches arranged in separate lines across said bed, one line overlapping another line but extending less than the entire distance across the bed.

16. The combination with a press-bed of punches and dies arranged in corresponding lines in direction generally crosswise of the bed, a series sufficient to extend across the bed being broken into separate lines of less than the width of the bed, said broken lines being separately adjustable.

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

DAWSON M. HUMISTON.

Witnesses:
WILLIAM J. PARKS,
ARTHUR J. STEFFENS.