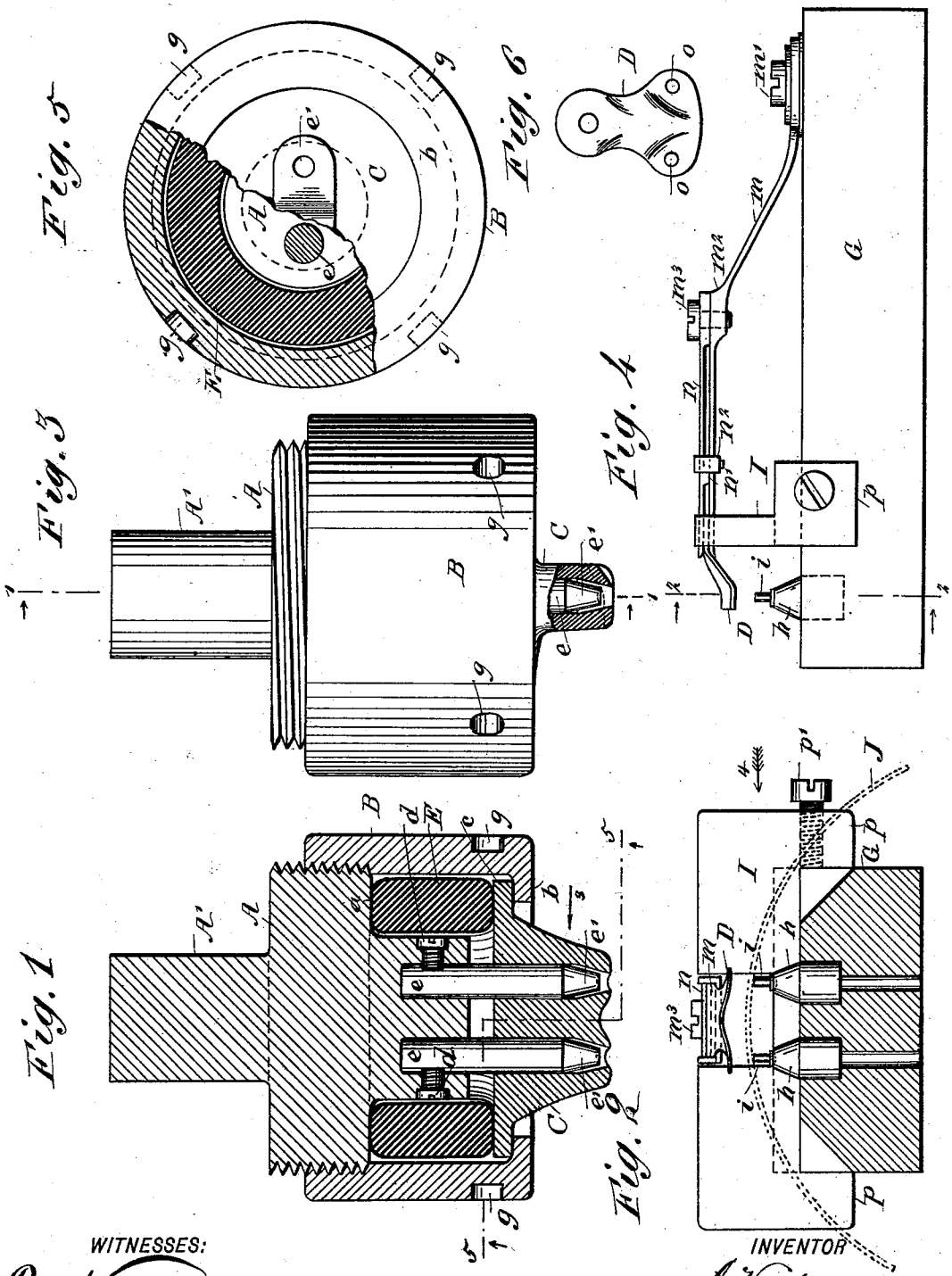
(No Model.)

A. VUILLIER.

MACHINE DIE.

No. 508,789. Patented Nov. 14, 1893.



WITNESSES:

C. Neveux

C. Sedgwick

INVENTOR

A. Vuillier

BY Munn & Co

ATTORNEYS.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

AIMÉ VUILLIER, OF MILLIS, MASSACHUSETTS.

MACHINE-DIE.

SPECIFICATION forming part of Letters Patent No. 508,789, dated November 14, 1893.

Application filed January 28, 1893. Serial No. 460,086. (No model.)

To all whom it may concern:

Be it known that I, AIMÉ VUILLIER, of Millis, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Machine-Dies, of which the following is a full, clear, and exact description.

This invention relates to improvements in dies for setting rivets, and particularly for the riveting of ears upon pails and like articles of manufacture, and has for its object to provide novel devices of the character indicated, which will be applicable to punching machines or drop presses of any approved style, and afford means to secure a pail ear in place on the pail body, by one stroke of the machine, in a neat and rapid manner.

To this end, my invention consists in the construction and combination of parts, as is hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical sectional view of the upper die of the improved set of two dies that co-act in a proper machine, the section being indicated by the line 1—1 in Fig. 3. Fig. 2 is a vertical sectional view of the complementary lower die of the set, taken on the line 2—2 in Fig. 4. Fig. 3 is a side view of the upper die, broken away below opposite the arrow 3 in Fig. 1. Fig. 4 is a side view of the lower die and ear-holding attachment, taken in direction of the arrow 4 in Fig. 2. Fig. 5 is a reverse plan view of the upper die, partly broken away, and in section on the broken line 5—5 in Fig. 1; and Fig. 6 is a side view of a pail ear, that is of the style the dies are designed to affix by rivets, upon a pail body or other sheet metal receptacle that is to be furnished with a bail handle.

The die block A, is by preference given a cylindrical form, and from its upper face a shank A′ is axially projected, which part is to engage a socket hole in the vertically reciprocating head of a power actuated punching machine. (Not shown.) Said shank which may be of any preferred peripheral shape, is shown as cylindrical.

The die block A, is of a suitable length for its purpose and from or near the longitudinal center its lower portion is reduced in diameter a proper degree, the part above the shoulder *a*, thus produced, being peripherally threaded to receive the interiorly-threaded upper portion of a keeper sleeve B, which is tubular, and of a proper length to afford support to other parts, an inwardly projecting flange *b*, on the lower terminal of the keeper sleeve, serving as a seat for the stripper block C, that is an important feature of the upper die.

The block C, is circular at its upper end whereon a radial flange *c*, of a correct thickness is produced, the diameter of which is proportioned to permit said circular flange to loosely fit within the keeper sleeve B, and rest upon the flange *b*, of said sleeve.

Below the range *c*, the body of the stripper block C, is by preference reduced on the front and rear sides, and converged downwardly on the edges so as to lighten this portion of the block by removal of material, thus affording a laterally elongated lower portion which projects downwardly through the circular opening in the sleeve B that is bounded by the inner edge of the flange *b;* and it will be seen, that the lower end of the stripper block has its face shaped to conform with the side surface of the ear D, that is exterior when affixed to a pail or like receptacle.

At an equal and correct distance from the longitudinal center line of the die block A, and in its lower face two round socket holes are formed of an equal depth in parallel planes, and of a suitable and like diameter; these perforations being designed to receive the pair of similar punches *e*, that are cylindrical in the body, fit neatly in the socket holes of the die block A, and are therein secured by the set screws *d*, that are inserted in threaded holes in the side of the reduced cylindric part of the die block, and have a proper bearing on flattened seats made to receive their ends, on the sides of the punches near their upper terminals, the latter being in contact with the bottom walls of the socket holes of the die blocks.

The punches *e*, are of such a length as will permit them to project below the die block A, sufficiently for effective service, and near their lower ends have similar cone points *e′* formed thereon, so reducing the area of the faces on the lower terminals of the punches,

as to adapt them to serve as riveting hammers, said faces being made slightly concave to more perfectly effect the neat riveting operation, which will be further mentioned.

The stripper block C, is perforated in parallel from the upper side, at correct points to permit the block named to receive the portions of the punches *e*, that project below the die block A, the diameter of said perforations being proportioned to allow the punches to loosely fit therein, and the stripper block thus be adapted to slide on said punches. Preferably the perforations in the stripper block are made coniform near their lower terminals to adapt them to conform to the shape of the punches at their conical points.

The annular space afforded by the reduction of the body of the die block A, is occupied by a spring E, that is represented as made of vulcanized gum, but may be a spiral metallic spring if preferred, said spring being intended to normally hold the stripper block C, upon the flange *b*, of the keeper sleeve B, there being a proper space allowed to intervene between the lower face of the die block A, and top face of the stripper block C, to permit the latter named piece to slide upwardly and expose the normally incased points of the punches *e*, when said stripper block is made to impinge on some supported object below it.

The keeper sleeve B, is furnished with spaced socket holes *g*, that are designed to receive the end of a pin lever or the teat of an ordinary spanner wrench, which by manipulation in a proper direction will screw the sleeve upon or off the die block A, as may be required.

The lower die of the complementary set of two dies that constitute the improvement, consists of an oblong rectangular metallic block G that is of correct dimensions for its use, said block being mounted upon a proper base, or bed plate of a punching machine whereon the upper die that has been described is attached and adapted to reciprocate in a vertical plane. At points that will adapt them to axially align with the punches *e*, two cylindrical anvil blocks *h*, are seated in suitably formed recesses in the lower die-block G, these pieces of like form, being neatly fitted in the cylindrical cavities they occupy.

The upper ends of the anvil blocks *h*, are conically formed, and have such a relative diameter given their upper terminals as will produce circular faces thereon of proper area to receive and sustain the flanged ends of metal rivets *i* as indicated in Figs. 2 and 4.

A novel and essential part of the improvement, consists of a supporting device for the pail ears D, such device comprising two main portions *m*, *n*. The part *m*, is formed of steel or resilient brass, and is in the shape of a comparatively thin strip of metal having a proper width, and made parallel on the side edges. At one end, the spring plate *m*, is perforated for the reception of a screw *m'*, that secures the spring at this end upon the die block G. From the secured end, the spring plate *m*, is bent upwardly and toward the anvil blocks *h*, its upward inclination terminating at a suitable distance from the screw *m'*, where it is bent to project its remaining part in a plane parallel with the level surface of the die-block G and at a correct height therefrom, its front terminal being located a short distance behind the anvil blocks, as shown in Fig. 4. At m^2, where the spring plate *m*, is bent to render its forward part level, a thickening of the plate body is produced, for the formation of a screw hole therein, and on this portion of the spring plate another spring plate *n*, of an equal width is imposed and secured thereto by a screw m^3, that is inserted through a perforation of proper size formed in said plate *n*, near the rear end. The portion of the plate *n*, that is engaged by the screw m^3, is of greater thickness than the part forwardly thereof, which part is resilient.

The front portion of the spring plate *n*, is of an equal thickness to that of the resilient part mentioned, and at a correct distance from the forward terminal of the plate *n*, a flattened projection *n'*, is formed on its lower side, thus affording a shoulder at the forward transverse edge of this projection, which latter is at such a distance from the free front ends of the two spring plates *m*, *n*, as will provide an abutment between said parts, that will limit the introduction of a pail ear D, between the plates *m*, *n*.

Upon the lower side of the spring plate *m*, near the thickened part *n'* of the upper spring plate *n*, a guide box n^2, is secured, this box being formed of a metal strip of a proper and equal thickness, said strips being to afford two parallel flanges at right angles to the flat part between them, said flanges embracing the edges of the spring plates *m*, *n*, when the guide box is secured transversely on the lower surface of the plate *m*, as before mentioned; so that the upper spring plate *n*, will be adapted to yield slightly in a vertical plane, and be retained in alignment with, and above the plate *m*.

To facilitate the insertion of the pail ears D, between the spring plates *m*, *n*, the adjacent corners on the free front ends of said plates are rounded as shown in Fig. 4, and when the ears D, are forced between the clasping spring plates, one at a time, the ear thus introduced will be held removably projected above the anvil blocks *h*, in such a relative position as will align the spaced perforations *o*, in the projecting part of the ear, with the rivets *i*, that are seated on the anvil blocks *n* and also with the lower cone points of the punches *e*.

By preference, the blocks *h*, are permanently magnetized so as to adapt them to hold the rivets *i*, on their upper faces, secure from accidental displacement.

Rearward of the anvil blocks *h*, a gage plate I, is transversely and removably se-

cured, said plate having depending opposite flanges *p*, on its ends, which are parallel on their inner faces, which latter are separated a proper degree to cause the flanges to embrace the side walls of the die-block G, when in position thereon; a set screw *p'*, in one flange serving to retain the gage plate at any desired point on the die-block, the upper portion of the plate I, having a notch of proper width and depth formed in it, at the center between its flanges to allow the front portions of the spring plates *m*, *n*, to project through the notch and freely vibrate therein.

In service, the dies being placed on a proper machine, so that they will co-act as indicated, a pail body J of cylindrical or other suitable form, is introduced above the magnetically-held rivets *i*, until its top edge engages the front face of the gage plate I, the sheet metal body of the pail that is to have ears attached, being located below a spring clasped ear D, as shown in Fig. 2. The upper die is now caused to descend, whereupon its stripper block C, will press the ear D, toward the outer surface of the pail body that is uppermost; downward motion of the upper die being continued until its pressure will cause the rivets *i*, to penetrate the pail body and pass through the perforations *o*, in the ear D, and when this has been effected, and the pail body is prevented from a further depression by the anvil blocks *h*, the stripper block C, will yield sufficiently to permit the cupped ends of the punches *e*, to impinge upon the upper ends of the rivets and upset them so as to produce a button set rivet head thereon, which will secure the ear D, on the pail body J, in a substantial and neat manner, by one stroke of the punching machine whereon the dies are secured and made to conjunctively operate.

It will be seen, that the work of affixing ears upon sheet metal receptacles, can with the improved dies, be rapidly and reliably effected, and by comparatively unskilled labor.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The upper composite die, comprising a die block, spaced, depending and parallel punches on the die block, a stripper block perforated to receive the punches, and held on the die block below it, a keeper sleeve screwed on the die block by its upper end, flanged inwardly at its lower end and on which flange a radial flange on the upper end of the stripper block seats, and a spring intervening the die block and stripper block, substantially as described.

2. The composite lower die, comprising an elongated die block, upright anvil blocks at the front of the block, a double plate-spring clasping device on the die block, adapted to hold pail ears above the anvil blocks, and a gage plate adjustable on the die block, substantially as described.

3. The composite upper die, comprising a cylindrical die block having an axial shank on its upper face and threaded peripherally near the top, having its body reduced diametrically below the thread, a cylindrical keeper sleeve internally threaded and engaging therewith the thread on the die block, an inwardly extending radial flange at the base of the keeper sleeve, two parallel depending spaced punches secured in sockets in the under face of the die block and cone-pointed at their lower ends, a stripper block perforated to slip on the punches and radially flanged at its upper end to seat on the flange of the keeper sleeve, and a spring encircling the reduced part of the die block and intervening its shoulder and the top of the stripper block, substantially as described.

4. The composite lower die, composed of an elongated rectangular die-block, cylindrical anvil blocks seated in spaced vertical sockets at the front of the die-block, an adjustable gage plate notched centrally on its upper edge, and a spring clasping device, composed of a bent lower spring plate secured at its rear end to the top of the die block, an upper straight spring plate shorter than and secured upon the lower plate by its rear end near the center of said lower plate, and a guide piece secured on the lower spring plate and having opposite vertical flanges loosely embracing the edges of the upper spring plate, substantially as described.

AIMÉ VUILLIER.

Witnesses:
JOHN S. SNELL,
PETER TOBLER.