

No. 674,647.

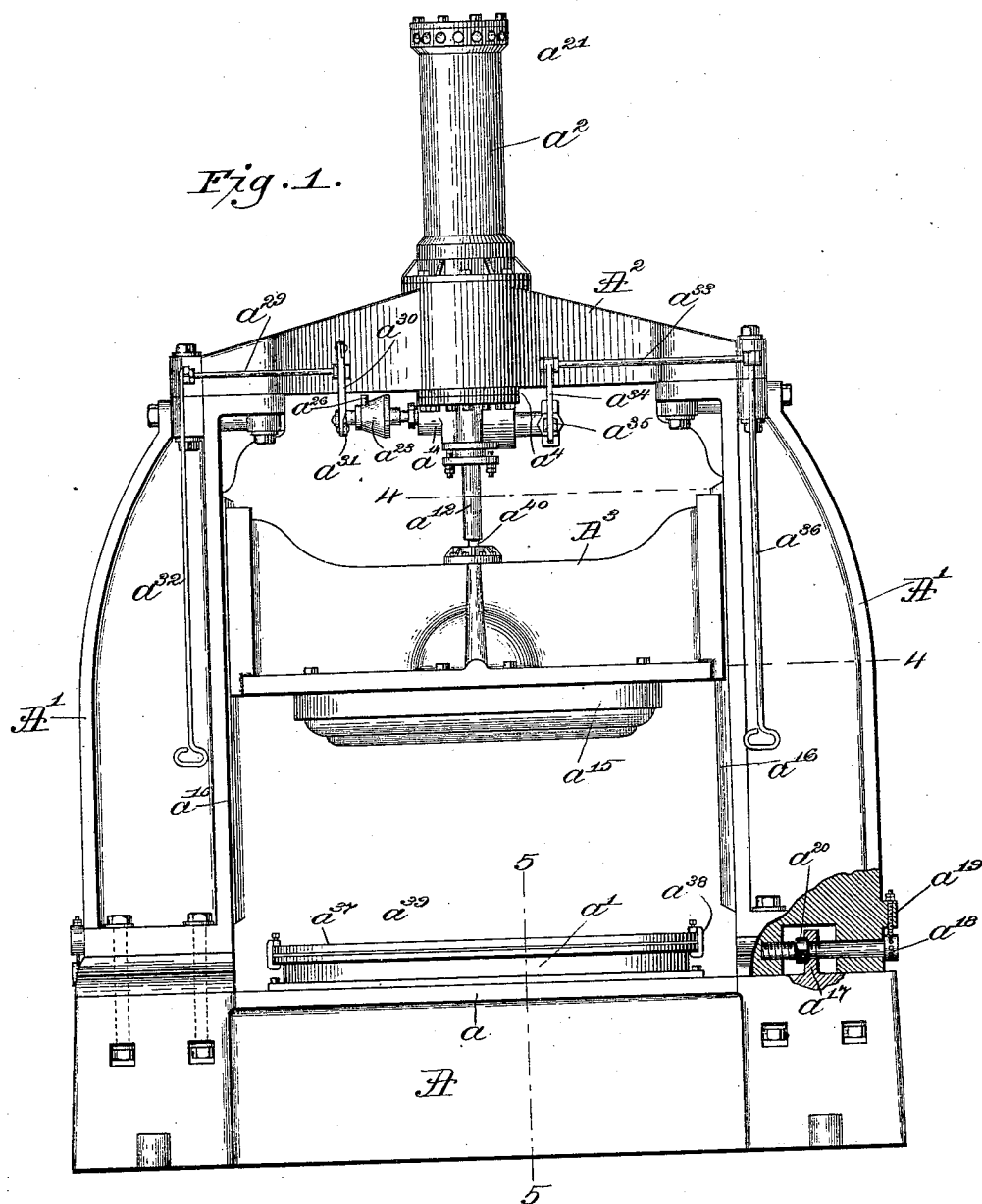
Patented May 21, 1901.

C. M. DRENNAN.
MACHINE FOR STAMPING METAL COFFINS.

(Application filed May 28, 1900.)

3 Sheets—Sheet 1.

(No Model.)



Witnesses:

Frank G. Hattie

Thomas J. Drummond

Inventor

Charles M. Drennan,

by Wesley Ferguson,

Att'y's.

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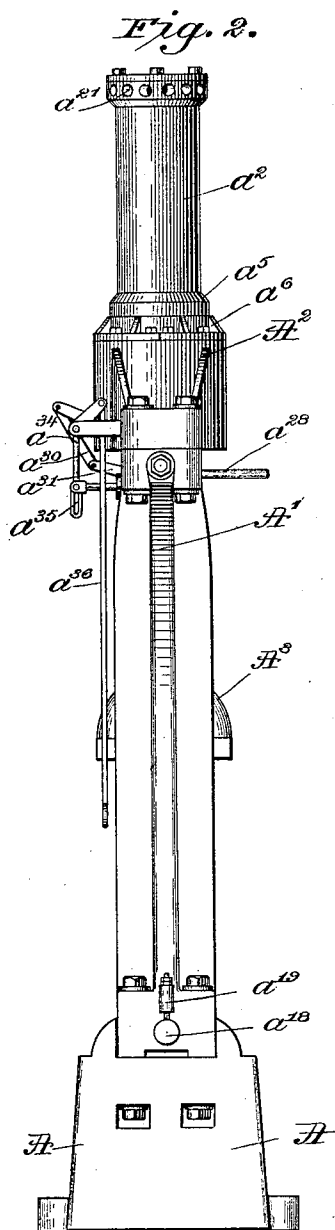
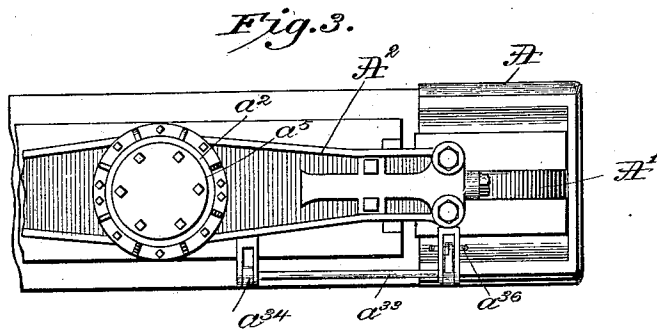
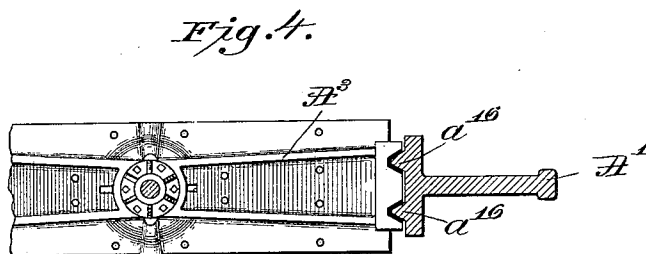
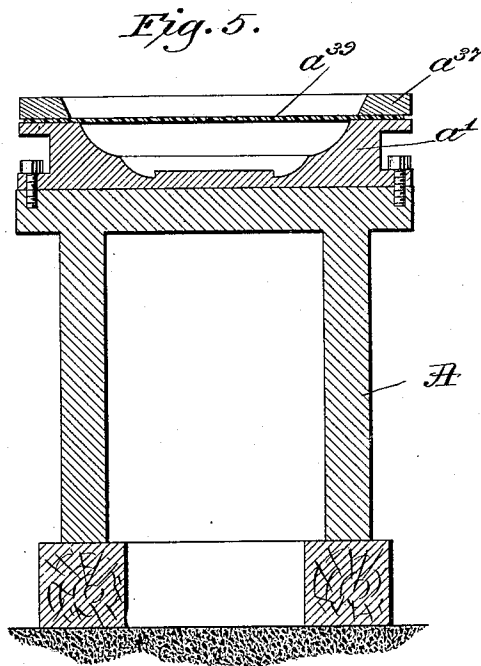
Patented May 21, 1901.

C. M. DRENNAN.
MACHINE FOR STAMPING METAL COFFINS.

(Application filed May 28, 1900.)

3 Sheets—Sheet 2.

(No Model.)



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No. 674,647.

Patented May 21, 1901.

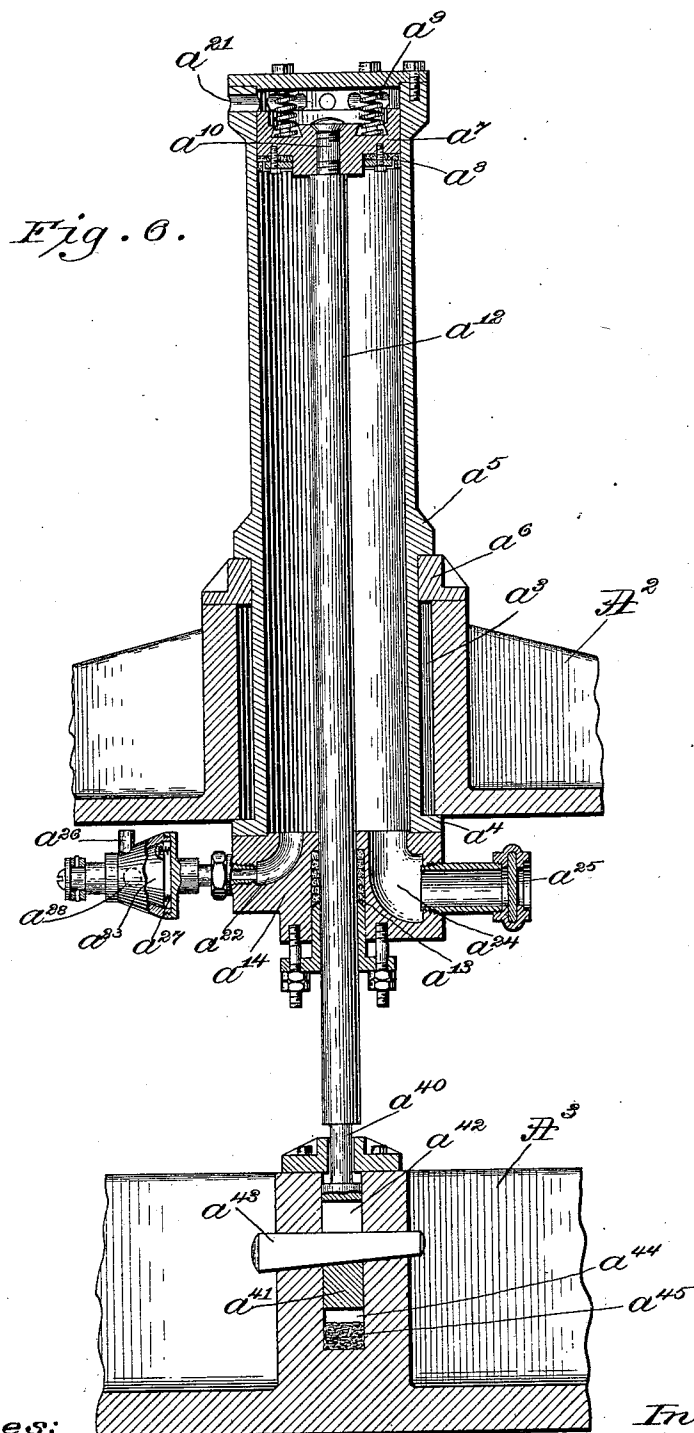
C. M. DRENNAN.

MACHINE FOR STAMPING METAL COFFINS.

(Application filed May 28, 1900.)

3 Sheets—Sheet 3.

(No Model.)



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UNITED STATES PATENT OFFICE.

CHARLES M. DRENNAN, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO AMERICAN METAL CASKET COMPANY, OF SAME PLACE AND KITTELY, MAINE.

MACHINE FOR STAMPING METAL COFFINS.

SPECIFICATION forming part of Letters Patent No. 674,647, dated May 21, 1901.

Application filed May 28, 1900. Serial No. 18,231. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. DRENNAN, a citizen of the United States, and a resident of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Machines for Stamping or Forming Metal Coffins, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

Many attempts have been made to form pressed sheet-metal coffins and like objects; but heretofore it has been found impossible to establish a great industry in this line because of the peculiar difficulties attendant upon pressing sheet metal into forms of sufficient sharpness and exactness to present an artistic appearance at all resembling carving or similar artistic work in wood.

My present invention has for its object the provision of a press or machine capable of forming ornamental sheet-metal coffins and like objects having all the requisites of permanently sharp lines and rigid formation that this art requires, as above explained.

In carrying out my invention I form the sides and ends and top and bottom with as great depth of beading or other relief work as may be desired, making the same out of plain sheets of metal, not by pressure analogous to squeezing or such as is given by a relatively slow movement, but by a quick sharp striking blow given in such a manner as to be a dead-blow without rebound, and I have found that by this means I am enabled to prevent the injurious effects of that relaxation of the metal which has been found to ensue when the pressure has been delivered by an ordinary press such as has heretofore been employed in working sheet metal, and my invention resides in a means whereby the above objects are obtained.

The constructional details of the preferred embodiment of my invention as herein shown will be fully explained in the course of the following description, reference being had to the accompanying drawings.

In the drawings, Figure 1 is a front elevation thereof, partly broken away. Fig. 2 is a side elevation looking at Fig. 1 from the

right hand. Fig. 3 is a fragmentary view in top plan. Fig. 4 is a horizontal section taken on the line 4 4, Fig. 1. Fig. 5 is an enlarged vertical cross-section taken on the line 5 5, Fig. 1. Fig. 6 is an enlarged broken detail, in central vertical section, through the operating-cylinder and connected parts.

I have discovered that the main reason why work of this character has not been successful heretofore except for the very simplest plain patterns has been because the metal when pressed to the form of the dies has invariably relaxed or recovered more or less of its original shape, thereby destroying the sharpness of figure essential to this work and rendering the product comparatively worthless on the market, and I have discovered that the main cause of this difficulty has resided in the fact that the means employed have given the blows slowly—as, for example, would be the case in a hydraulic press. On the other hand, I have also found that a press necessarily of the enormous size and weight required for such large stampings if constructed along the lines of the ordinary press was quickly self-destructive and presented a series of special problems to overcome.

On a suitable base A, preferably made in a single casting, as shown, I provide a bed-plate *a*, herein shown as formed by the top of said base, and on this bed-plate is rigidly secured the female die. On each end of the base A is rigidly mounted a column or pillar *A'*, which together support at their upper ends a cross-beam *A²*, of proper shape and construction to sustain a cylinder *a³*.

Referring more particularly to Fig. 6, it will be seen that at the middle or crown part of the cross-beam *A²*, I provide a vertical cylindrical opening *a³*, larger in diameter than the outside diameter of the cylinder *a²*, and provide on the latter an annular flange or boss *a⁴* at its lower end and another flange *a⁵* intermediate its ends, the flange *a⁴* being larger than the opening *a³* and the flange *a⁵* being the same size or slightly smaller than said opening. This construction is provided to permit the cylinder to be passed endwise up through the opening *a³* into position, as shown, whereupon two semicircular blocks or

halves of a retaining-ring a^6 are secured in place beneath the flange or rib a^5 and proper fastenings are secured, all rigidly securing the cylinder in place, but permitting of quick adjustment or removal thereof, if required.

5 Within the cylinder is mounted a plunger or piston, whose head a^7 is provided with suitable packing a^8 and coiled springs a^9 and is secured at a^{10} to a stem or rod a^{12} , which passes through a suitable gland a^{13} , contained in a head a^{14} , secured to the lower end of the cylinder inclosing the same, said rod a^{12} serving to support and raise the male-die carrier A^3 , which, it will be understood, is very large and exceedingly heavy, especially taken in connection with the male die a^{15} , which is secured on the under side thereof. This die-carrier operates on ways a^{16} at its opposite ends, projecting from the columns A' .

20 As already explained, it is imperative that the two dies should come together with extreme precision in order that the lines may be sharply defined and also to prevent shearing of the metal and avoid other complications, and yet it is also necessary that the movable die should be permitted to fall freely thereon the greater part of its extent, and accordingly I have provided means whereby the guides or ways a^{16} may be caused to approach each other very slightly at their lower portions and may be thus adjusted to take up all wear, similar means of adjustment being provided in connection with each column and being shown in detail at the right of Fig. 1, where it will be seen that a rib or lug a^{17} is provided on the base, and the heavy bolt a^{18} passes through the bifurcated lower end of the column, being retained in adjustment by a set-screw a^{19} entering the head thereof, said bolt operating in the nut a^{20} , preferably let into the inner side of the lug a^{17} , and also operating against the opposite side of the bifurcated end of the column. By this means this device, although extremely heavy, may be adjusted with extreme accuracy.

Referring now more particularly to the piston and connected mechanism, it will be seen that I provide at the top of the cylinder a series of openings a^{21} to permit of the free passage of air, and at the lower end of the cylinder I provide an inlet a^{22} , connecting with a two-way valve a^{23} , and a large opening a^{24} , connecting with a cut-off or throttle valve a^{25} . The valve a^{23} has an outlet-port a^{26} in its casing opening freely to the outer air and is preferably conical in shape and normally held by springs a^{27} in closed position. The valve a^{23} is connected with any suitable source of compressed air or steam, preferably the former, by an inlet-port a^{28} (shown in dotted lines in Fig. 6) and is operated by means of a rock shaft or lever a^{29} , connected at its inner end by a link a^{30} and lever a^{31} to the valve and at its outer end to the operating-handle a^{32} . The valve a^{25} is similarly operated by a rock-shaft a^{33} , provided at its inner end with a lever a^{34} , joined by a pin-and-slot connection

a^{35} to the projecting valve-stem of the slide or throttle valve a^{25} , said rock-shaft having an operating-handle a^{36} at its outer end. The die a' is provided with a clamping-ring a^{37} , secured rigidly by any suitable means a^{38} to the die, so as to retain as immovably as possible the edges of the sheet metal a^{39} to be formed.

It has heretofore been customary to clamp the sheet metal by means of a clamp which was carried by the movable die; but where a quick sharp blow is given, as it is in the present machine, such a clamp is ineffective, and it becomes necessary to retain the sheet metal at its edges in the manner shown.

The stationary or female die has a clamping-ring mounted around its periphery in clamping contact with the edges of the sheet metal at all points around the opening of said female die, so that when the male die descends it strikes against the sheet metal, which is suspended or held taut over the central opening of the female die, and forces said metal with an instantaneous dead-blow sharply against the edges and forming contour of the two dies, and the two provisions of having the metal held unyieldingly at its edges and the blow being also an unyielding or dead blow cooperate to cause the metal to stretch and form throughout its area rather than to crimp and contract it, as would be the case if the edges were held by a clamp carried by the movable die; also, because of the dead-blow and great weight of the following parts I have found it necessary to provide a certain freedom of movement at the point of connection of the piston-rod with the die-carrier, the piston-rod being for this purpose reduced in size at a^{40} , and the head a^{41} thereof is slotted at a^{42} to receive loosely a transverse pin a^{43} , the bottom of the slot a^{44} , formed in the carrier to receive said head, being provided with a compressible substance a^{45} to relieve the shock of the slight rebound which is inevitable when the dies come together.

Having provided the machine, as above explained, its operation is as follows: Supposing that the top of the casket is to be struck up, the die in such case being of the pattern shown, the die a^{15} is accurately alined with the die a' by shifting the standards A' to such minute degrees as may be necessary, the guides a^{16} being brought together slightly at their lower ends, so as to make it absolutely certain that when the die and die-carrier are permitted to drop they will be brought by reason of the slightly-converging guides a^{16} into correct position with perfect precision, inasmuch as said precision is essential in connection with the other features of operation to the production of the sharp clear lines required. The sheet of metal a^{39} is held tightly clamped at its edges, as shown, and then the exhaust a^{25} is opened to the outside air, thereby releasing the compressed air which has been holding up the piston and at the same time permitting all the air contained in the cylinder beneath the piston to rush out rap-

idly and allow the die a^{15} and die-carrier to fall suddenly without hindrance, thereby insuring a sharp heavy dead blow without any retarding influence whatever. The result of this blow is that the metal is stretched not by a molding or working pressure, such as is given by a slow movement, which I have termed a "squeezing" movement, but is stretched suddenly and quickly, with the effect of hardening or perhaps crystallizing the metal into the resulting shape, there being no tendency in the metal to recover its original shape. I regard this discovery as a most important part of my invention, and it is with the purpose of attaining this object that I have invented the machine described, it being the object of this machine to form the large sheet of metal by instantaneous movement. The sudden terrific blow given by the following die and carrier sets the metal in sharp lines, and if there should be any indefiniteness whatever because of the configuration of the pattern or because of the extreme depth of the pattern a second similar blow will set and harden it in sharp lines as desired, the binding-ring serving to retain the upper edge of the metal and cause the latter to be pulled down or spread thinly over all the sharp corners and following the configurations of the die. The blow struck is extremely severe and would shatter the piston connections were it not for the slight yielding provision made at the connection of the rod with the carrier, this connection serving to take up the momentum of the piston and rod and the reaction of the die-carrier. By reason of the large area of inlet through the port a^{21} and the large area of outlet at the bottom of the cylinder the rapid blow of the die and carrier is free from any cushioning effect or retarding influence from above, and another important feature resides in what I call the "dead-blow." I mean by this term a blow which is without any influence for driving or retarding from steam or compressed air or other motive power.

I am aware that there have been a great many forms and kinds of presses; but so far as I am aware none of these have proceeded on the principle above explained, and none of them have been capable of producing the exact resemblance to wood carving and molding, which it is the primary object of my invention to secure by reason of the sharp accurately-defined lines and died surface.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A machine of the kind described, comprising a bed-plate for supporting a die, a movable carrier for supporting a complementary die, guides for said carrier, means located at and acting solely on the lower ends of said guides for bringing said dies into exact alinement at the point of their approach to each other, means at the upper ends of said guides for maintaining the said ends

thereof separated and uninfluenced by said alining means, a cylinder, a piston in said cylinder, a piston-rod extending from said piston and connected to said carrier, means for admitting compressed air or steam for lifting said piston and carrier, and means for permitting said carrier and movable die to fall and give a dead-blow on the metal held by said stationary die.

2. A machine of the kind described, comprising a bed-plate carrying a stationary die, side guide-pillars, a movable die and die-carrier guided by said pillars, and means mounted on the upper ends of said pillars for raising said die and die-carrier, said pillars at their lower ends being adjustable toward said stationary die, and at their upper ends being held rigidly apart and independent of the said adjustability of their lower ends.

3. A machine of the kind described, containing a base-plate for supporting a stationary die, side pillars, a die-carrier and movable die guided by said side pillars, a cross-beam connecting the upper ends of said pillars, a cylinder carried by said cross-beam, a piston contained in said cylinder, a piston-rod extending from said piston to said carrier and provided with a connection thereat permitting relative movement, means at the upper end of said piston permitting the unrestrained passage of air, and means at the lower end of said cylinder for permitting the entrance of compressed air or steam for raising the piston and for permitting the unrestrained escape of said air or steam to allow the carrier and die to fall and give a dead-blow on the sheet metal supported by said stationary die, the steam-outlet being larger than the steam-inlet.

4. In a machine of the kind described, containing a stationary die, a movable die and carrier therefor, a frame for said parts, said frame including a cross-beam having a vertical cylindrical opening therein, and a cylinder, said cylinder having adjacent to one end opposite flanges, one of said flanges having a diameter small enough to permit it to pass through the opening in said beam, and a sustaining-ring adapted to rest on the top end of said opening and engage beneath the adjacent flange of said cylinder for supporting the latter in mounted position on said beam, a piston and piston-rod operating in said cylinder and connected to said carrier, and means for operating the same.

5. A machine of the kind described, containing a stationary die, a movable die and a carrier therefor, a frame for guiding said movable die and carrier, and a cylinder mounted vertically in said frame about said die-carrier, said cylinder having a closed upper end and a series of radial openings adjacent said closed upper end for permitting the unrestrained passage of air in and out as required, and having its lower end closed and provided with a passage for the entrance of compressed air or steam, a valve controlling said entrance, and

a second passage of large area sufficient to permit the unrestrained outflow of said air or steam and enable the movable die to give a dead-blow uninfluenced by the outflowing steam, a valve controlling the same, a piston in said cylinder, and a rod connecting said piston and said carrier.

6. A machine of the kind described, comprising a base-plate and a stationary die mounted thereon, said die being provided on its upper side with a clamping-ring for retaining a sheet of metal clamped at its edges to said stationary die, and means cooperating with said ring and said die for clamping the ring in immovable holding engagement with said die, a frame, a movable die and carrier guided in said frame, a cylinder mounted vertically in said frame above said carrier, a piston and piston-rod operating in said cylinder and connected to said carrier, means for raising said piston and connected parts, and means permitting but not retarding the fall

of said piston, rod, carrier and movable die to give a dead-blow on the sheet of metal retained between said ring and stationary die. 25

7. In a machine of the kind described, a female die, a stationary support for said die, a clamping-ring having an opening of greater area than the area of the opening in said dies, and adapted to clamp the sheet metal outside the opening of said die and hold said metal in fixed position, a male die, a carrier therefor, guiding means for said carrier, means to lift said carrier and male die, and to enable said carrier and die to drop with a dead-blow, and meet the clamped sheet metal, and form it into the female die. 30 35

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES M. DRENNAN.

Witnesses:

AUGUSTA E. DEAN,
GEO. W. GREGORY.