(No Model.) 2 Sheets—Sheet 1.

J. S. PALMER.

MACHINE FOR DRAWING METALLIC SHELLS.

No. 342,840. Patented June 1, 1886.

Fig. 4.

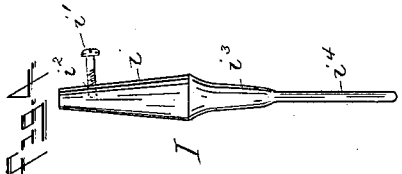


Fig. 5.

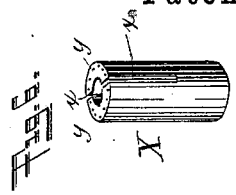


Fig. 6.

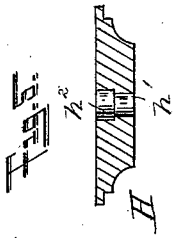


Fig. 3.

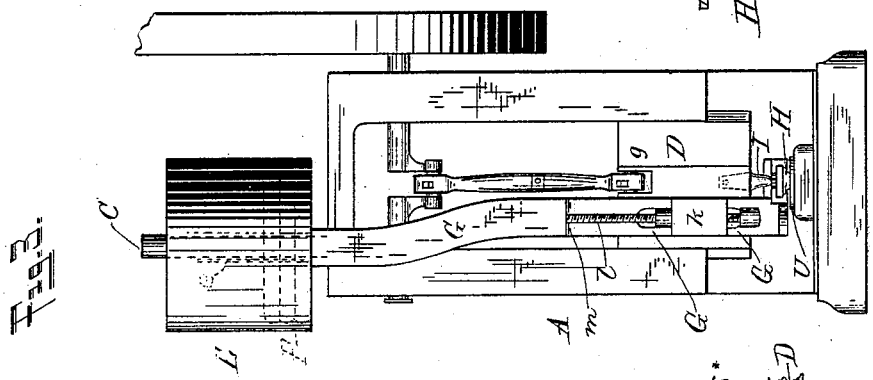


Fig. 2.

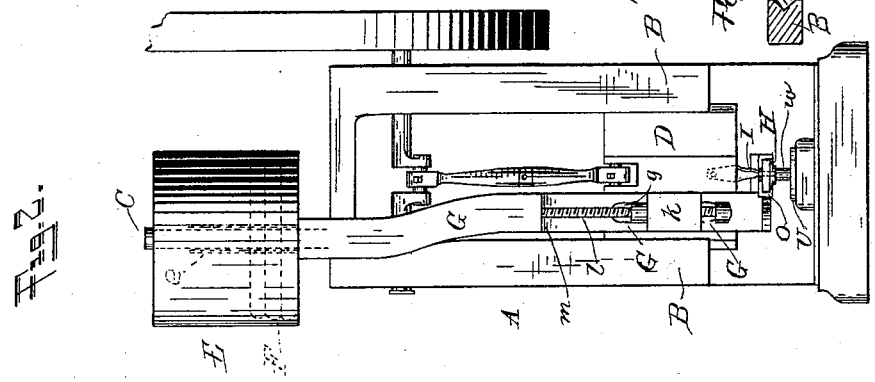
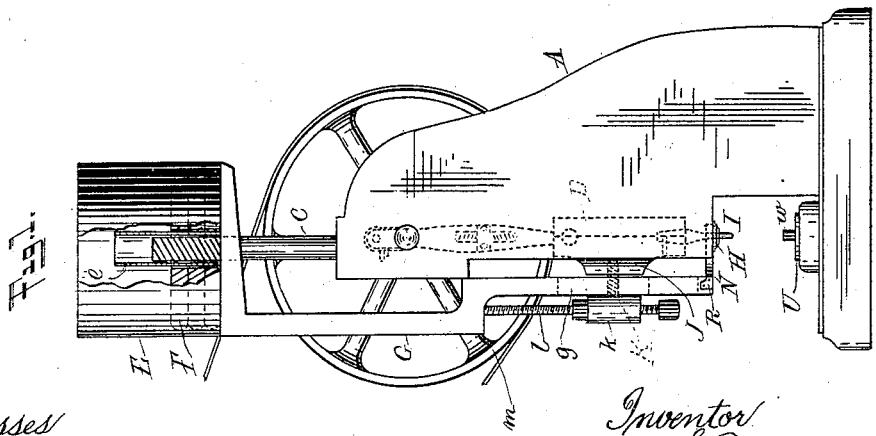


Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

J. S. PALMER.

MACHINE FOR DRAWING METALLIC SHELLS.

No. 342,840. Patented June 1, 1886.

Fig. 1.

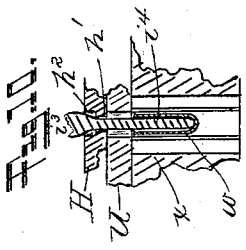


Fig. 2.

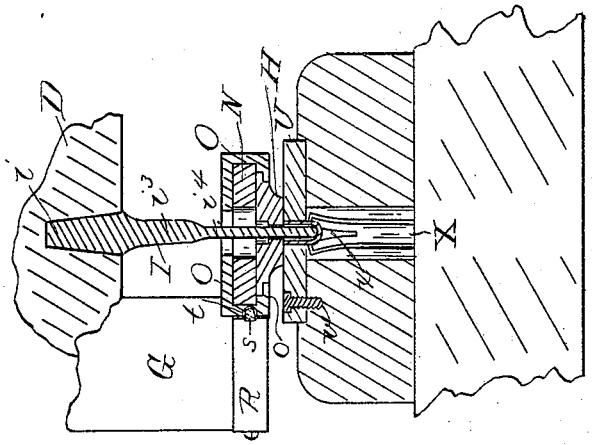


Fig. 3.

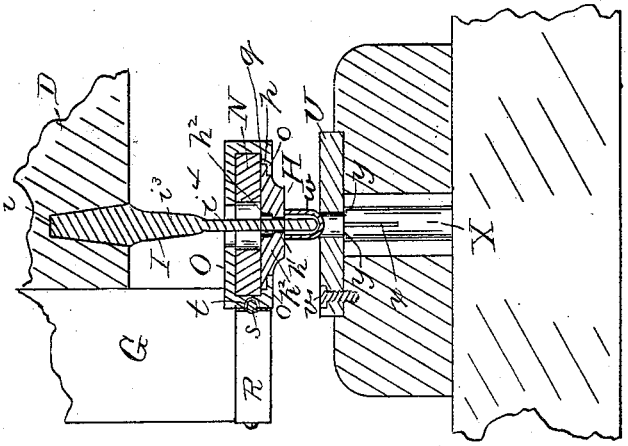
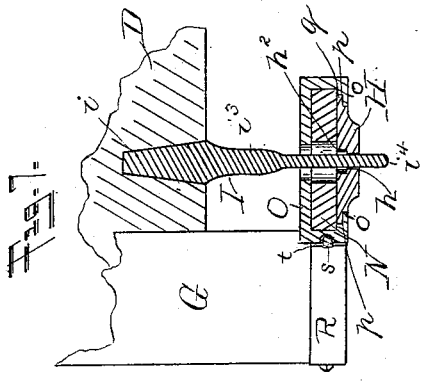
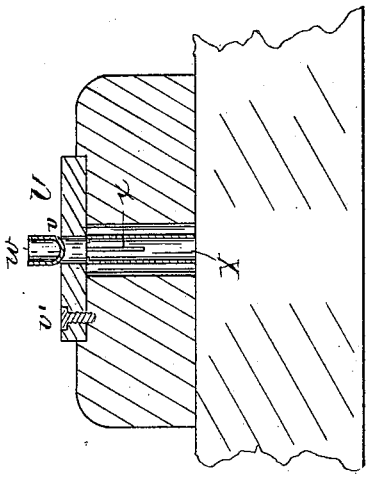


Fig. 4.





Witnesses.
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L. C. Wildman.

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UNITED STATES PATENT OFFICE.

JOHN S. PALMER, OF PROVIDENCE, RHODE ISLAND.

MACHINE FOR DRAWING METALLIC SHELLS.

SPECIFICATION forming part of Letters Patent No. 342,840, dated June 1, 1886.

Application filed November 25, 1885. Serial No. 183,961. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. PALMER, of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Machines for Drawing Plated-Metal Shells; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My present invention consists of still further improvements on those shown and described in my Patents No. 211,342, dated January 14, 1879, and No. 215,536, dated May 20, 1879, and its principal object is to relieve the closed end of the thimble of too great a strain from the action of the punch.

My improvements may be said in a general way to consist in combining with the ordinary drawing-punch a disk or plate with a central hole through which the punch passes, and which is adapted to come in contact and press down against the open end of the thimble before the punch comes into operation and during the earlier stages of the action of the punch, so as to relieve the closed end of the thimble from the strain of the punch; and my improvements also consist in other details, as more particularly hereinafter described.

In the accompanying drawings, Figure 1 illustrates a side elevation of the machine, showing the positions of the parts before the disk and punch have come into operation. Fig. 2 illustrates a front elevation of the machine when the disk is in contact with the open end of the thimble. Fig. 3 illustrates a front elevation of the machine when the disk and punch have operated together and at the point when the disk finishes its operation and the punch continues to draw the metal. Figs. 4, 5, and 6 are details of the punch, disk, and discharging-spring, respectively. Fig. 6* is a detail section of one end of the slide and the adjacent vertical side of the machine-frame. Figs. 7, 8, and 9 are enlarged views of details in the positions shown in Figs. 1, 2, and 3, respectively; and Fig. 10 is an enlarged detail view showing the lower parts of the machine when the drawing of the shell is completed.

Although my machine may be used in drawing metal shells of any kind, it is more particularly adapted for drawing shells of plated metal to be used in the manufacture of finger-rings and other jewelry. It overcomes the difficulty heretofore experienced of turning up or drawing out the metal too abruptly, so as to strain or "grain" the exterior precious metal, which in such case is unable to be worked smooth afterward, and is necessarily spoiled.

Similar letters indicate like parts in all the figures.

A is the frame or support of the machine. B B′ are the two vertical sides of the same, and C is a vertical rod extending upward from the top of the machine. In the inner sides of the two vertical supports B B′ are vertical guideways or grooves *c c′*, in which works the slide or cross-head D. This slide may be operated in any suitable manner—as, for example, by an eccentric or crank attached to the upper end of the same, and as shown in Figs. 1, 2, and 3, which may be operated by an engine or otherwise.

E is a cylinder or box in which is secured a vertical tube or sleeve, *e*, and F are the weights through which the sleeve *e* passes. The rod C, passing up through the sleeve *e*, forms a guide for the vertical movement of the weight-box E.

G is a vertically-movable device attached at its upper end to the weight-box E, and attached to the lower end of said device is the disk H, in the center of which is a hole, *h′*.

I is the punch or drawing-tool, which may be secured in the bottom of the slide or cross-head in any suitable manner—as, for instance, by means of said punch having an enlarged conical end, *i*, which fits into a corresponding hole in the slide D, and which is held firmly in said slide by means of a set-screw, *i′*, passing through the slide into a slot or recess, i^2, in the punch. The central part, i^3, of the punch is of a diameter and length just sufficient to pass through the hole in the drawing-plate. This is to afford a convenient and ready means for setting the drawing-plate so that its hole will be directly under the punch. The circumference of the lower part, i^4, of the punch is still smaller than the part i^3, it being just as much smaller as the thickness of the metal after the

shell has been drawn through the plate. The circumference of the part i^3 will be the same as that of the hole in the drawing-plate and the exterior of the drawn shell, while the circumference of the part i^4 will be the same as the interior of the drawn shell. The part i^4 must also be of a length equal to or greater than that of the drawn shell.

J is a projection on the front of the slide D, in which the screw-bolt K is secured. This bolt passes through a vertical slot, *g*, in the device G, and has attached to its outer end a large vertical nut or square head, *k*, and passing through this nut or bolt head is an adjusting-screw, *l*.

m is a shoulder on the device G, which is adapted to rest on the upper end of the screw *l*. By means of the adjusting-screw *l* and shoulder *m* the play of the bolt K in the slot *g* and of the slot upon the bolt is limited and adjusted.

N is a lateral projection or ear extending from the lower end of the device G for holding the disk. This may be attached to the ear N in any suitable manner, so that the part i^4 of the punch can pass through the hole in said disk; but a very convenient way for attaching the disk to the ear N is the following: The ear N is embraced by a yoke, O, closed at its top and open at its bottom, and which is adapted to slide over said ear. The flanges or lips *o o* of the yoke have rabbets *p p*, in which the annular flange *q* of the disk H rests. The ear N has a hole through it large enough to allow the part *i* of the punch to pass through, and the closed top of the yoke O has a part cut away large enough to allow of the passage of said part *i*, and also to allow the yoke to slide back on the ear N away from the punch. The hole in the disk H is of a size just sufficient to allow the passage of the smallest part i^4 of the punch; but when the disk H is to be used with a small punch in which the part i^4 is of quite small diameter in proportion to its length, thus making said part weak and liable to break, the upper part of the hole in the disk is reamed out or countersunk (see h^2, Fig. 5) of a diameter equal to that of the part i^3, so as to allow said part to enter the hole a little way, and thus overcome so much liability of breaking the punch.

R is a spring, one end of which is attached to the device G, its free end having a pin or stud, *s*, which is adapted to fit into a corresponding hole, *t*, in the side of the yoke, to hold said yoke in place, and to provide a convenient means for removing and replacing the yoke, as well as removing the disk and punch and substituting others in their places.

U is the drawing-plate, which is placed upon the base of the machine so that its hole *v*, through which the metal is to be drawn, is directly under the punch.

v' is a set-screw for adjusting and securing the plate on the bed or base of the machine, as shown in Figs. 7, 8, and 9, and *w* is the thimble, with its closed end resting in the hole *v*. A convenient means for removing the thimble from the punch after the thimble has been drawn out is a spring, X. This spring is made from a piece of metal tubing, with vertical slots *x x* extending from its top some distance down its length, and has riveted to its upper edge and at right angles to its length two ears, *y y*, somewhat in the shape of crescents. This spring is attached to the base of the machine in any appropriate manner, with its upper end, upon which are the ears *y y*, directly under the hole in the drawing-plate.

I find the best results to follow in drawing out the shell to so adjust the screw *l* that when the device G and the slide D descend the disk H will strike the open end of the thimble a very little in advance of the punch I reaching the closed end of the same.

To operate the machine and draw the shell successfully, the slide is raised as far as it will go. The punch I is passed up through the yoke O and ear N and into the slide D, and then secured in place by the screw i'. The drawing-plate U is placed as near as possible, so that its hole will be under the punch I, and the slide D is lowered slowly by hand as far as the crank-bar will permit, so that the part i^4 of the punch will enter and pass through the hole in the drawing-plate. The jointed crank-bar will then be lengthened by means of its adjusting-screw until the part i^3 of the punch has entered the hole in the drawing-plate, which is now set in its true position, and may be secured in place by its set-screw. The jointed crank-bar is then shortened by means of its adjusting-screw raising the part i^3 of the punch out of the hole in the drawing-plate. The slide D is now raised by hand as far as it will go, the yoke O is slid back away from the punch, the disk H is slipped over the lower end of the punch and lifted until it comes against the under side of the ear N, when the yoke is slid forward to its original position, and its flanges or lips will then support the disk H, and the spring R will keep the yoke and disk in place. The thimble *w*, which has already been drawn from a disk to its present shape, is then placed vertically with its closed end in the hole in the drawing-plate. The device G is then adjusted, as above stated, with the shoulder *m* resting on the top of the screw *l*. The parts will then be in the positions shown in Figs. 1 and 7. The slide D is then made to descend, and by means of the screw-bolt K, which is attached to the same, and the adjusting-screw *l* the device G will also descend with the slide, by reason of the shoulder *m* of the device G resting against the top of the screw *l*, until the disk H rests against the edge or open end of the thimble *w*. The parts will now be in the positions shown in Figs. 2 and 8, with the bottom of the punch a short distance from the closed end of the thimble. The device G and the slide D continuing to descend, the pressure on the thimble will come upon its open end first, and by

reason of the weights F bearing upon the top of the device G the open end of the thimble *w* (which is now one size larger than the punch upon which it is being drawn) is somewhat spread out until the slide has descended so that the lower end of the punch has come in contact with the closed end of the thimble. The slide D and the device G will continue to descend, the disk H assisting the punch in proportion as it may be weighted in forcing the shell through the drawing-plate until said disk H rests upon the drawing-plate, when it can go no farther. (See Figs. 3 and 9.) The slide D and the punch I will continue to descend and draw the shell completely through the plate and between the ears *y y* of the spring X and past said ears, when the latter will close on the punch above the thimble, (see Fig. 10,) and the screw *l* will have receded from the shoulder *m*. The slide or cross-head D will then be raised, carrying with it the punch I. The upper edge of the thimble will be caught under the lower edges of the ears *y y*, the screw *l* will strike under the shoulder *m*, when the device G will also be raised. The punch I will have now completely passed out of the drawn shell, allowing it to drop through the tube, when another shell may then be inserted in the drawing-plate, and the preceding operation repeated. The last action of the punch, after the disk rests upon the drawing-plate, draws out the thimble without strain to its closed end, consequent upon so much surface of metal upon the punch making so much friction in addition to the power applied to the end.

I am enabled by my improved machine to accomplish with only five "strains" that which heretofore required seven.

My improvements may be used with any ordinary eccentric drawing-press, and I find the best results to follow their use with the conical roughened end punches and the vertically-sliding sleeve, as shown and described in my Patents Nos. 211,342 and 215,536, named above.

It is evident that any equivalent for the weight or weights may be used to force down the device G—as, for example, an air-chamber with an escape adjustment—to a given pressure.

In my Patent No. 215,536 the sleeve, which merely levels and does not force the shell into the drawing-plate, surrounds the punch, and is hung by a pin in a slot in the punch, whereas in my present invention the weight which serves to force the shell into the drawing-plate is upheld by a bar which is in no wise attached to the punch.

What I claim as new, and desire to secure by Letters Patent, is—

1. In combination with the drawing-punch, the positively weighted mechanism, substantially as described, adapted to force the shell or thimble into the drawing-plate by pressure upon the open end of the shell, said mechanism being unattached to the punch, and operating as set forth.

2. In combination with the drawing-punch, the weighted mechanism, substantially as described, for supplementing the action of the punch in the drawing of the shell by pressure upon the open end of the same, and the mechanism, substantially as described, for regulating the period of such pressure relatively to the action of the punch on the closed end of the shell or thimble, all as set forth.

3. In combination with the drawing-punch, a vertically movable and adjustable disk adapted to give the requisite pressure upon the open end of the shell or thimble by means substantially as described.

4. In combination, the drawing-punch, the vertically movable and adjustable device G, operated by means substantially as described, and the disk supported in the lower end of said device, all as set forth.

5. In combination with the drawing-punch and the slide which operates it, the nut-headed bolt K *k*, the adjustable screw *l*, the vertically-movable device G, and the disk H, all operating substantially as shown, and for the purposes set forth.

6. In combination with the drawing-punch, a vertically movable and adjustable disk adapted to give pressure on the open end of the shell or thimble by means substantially as described, and the drawing-punch, and discharging-spring X, all as set forth.

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