J. J. RIGBY.

MACHINE FOR CORRUGATING SHEET METAL.

APPLICATION FILED APR. 14, 1909.

948,551.

Patented Feb. 8, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

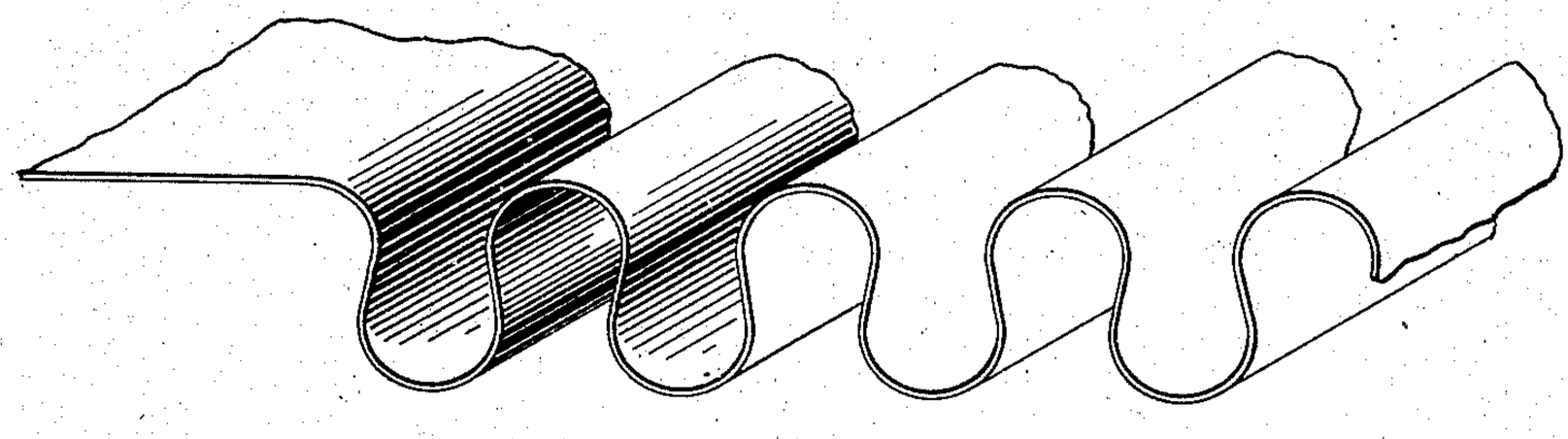
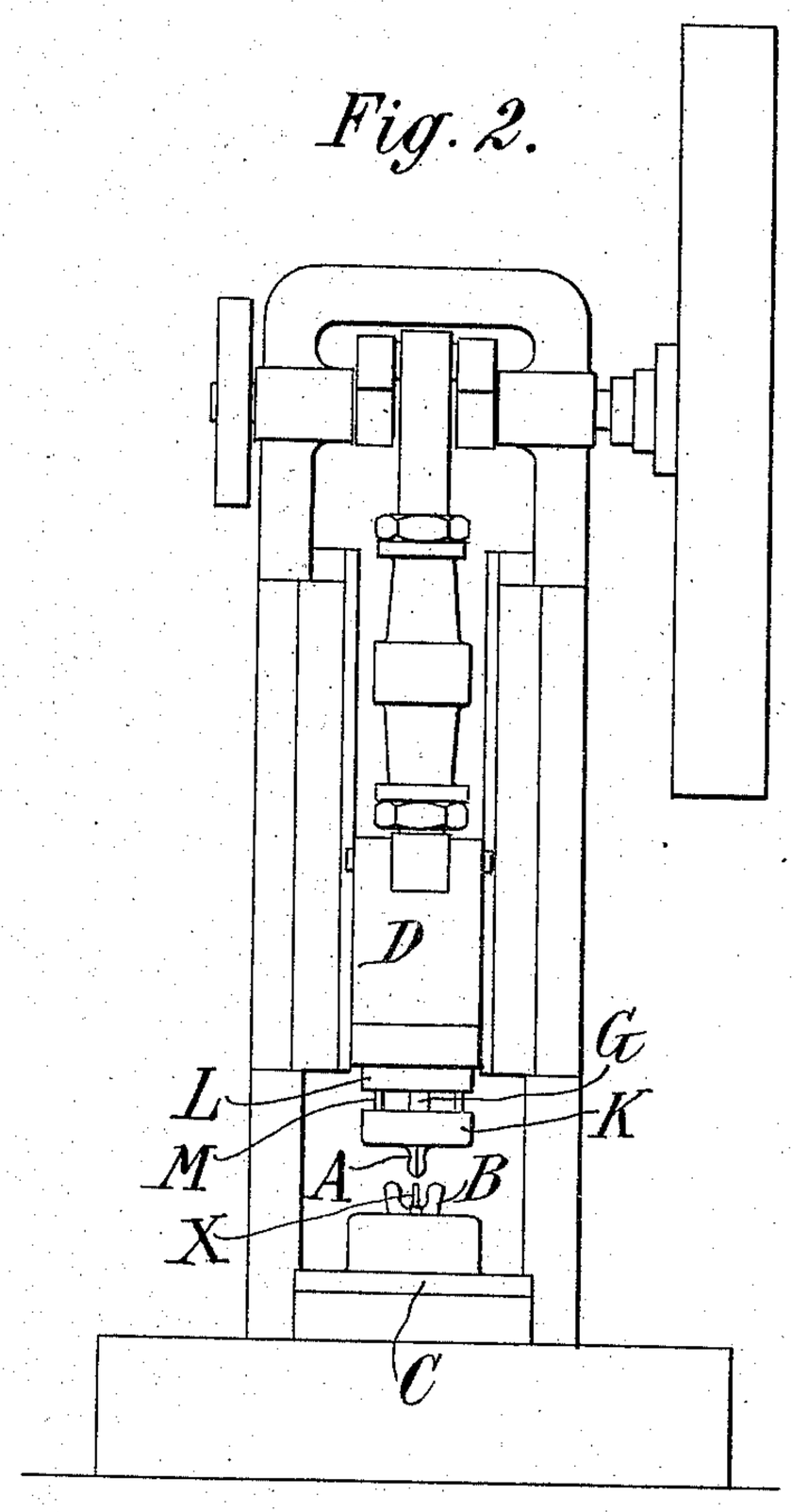


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

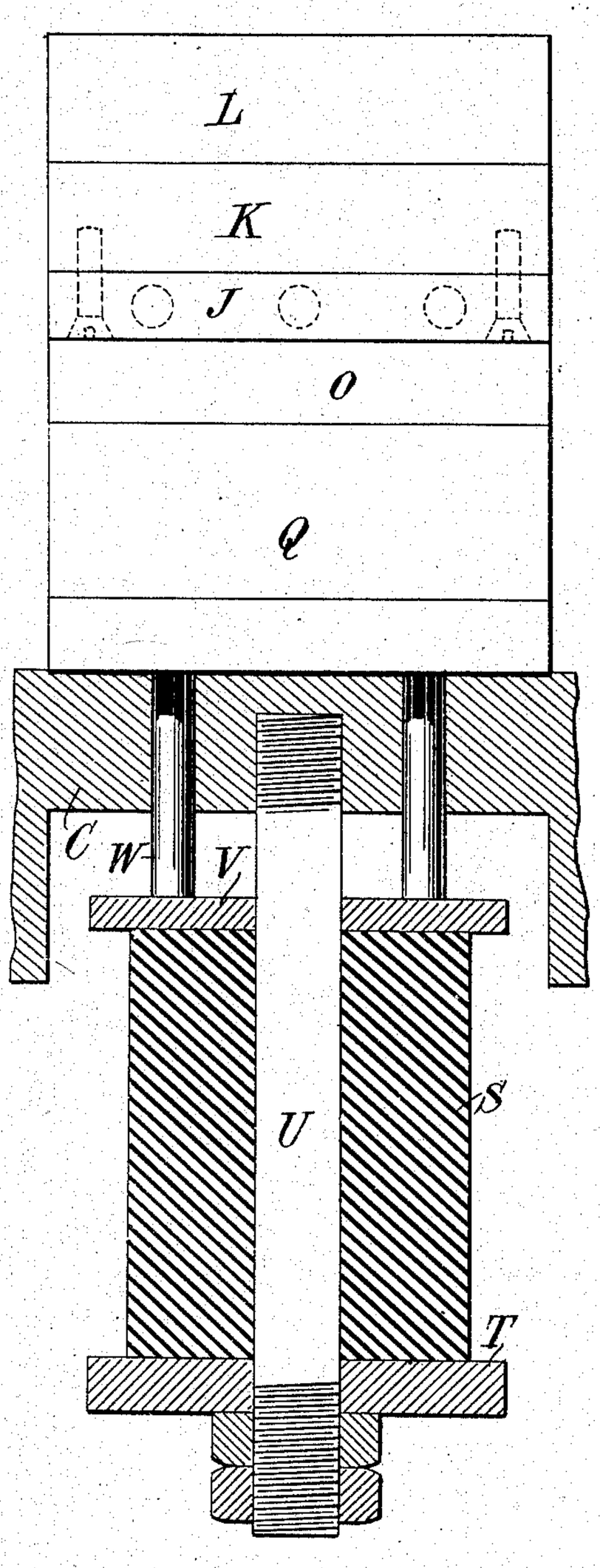


Fig. 4.

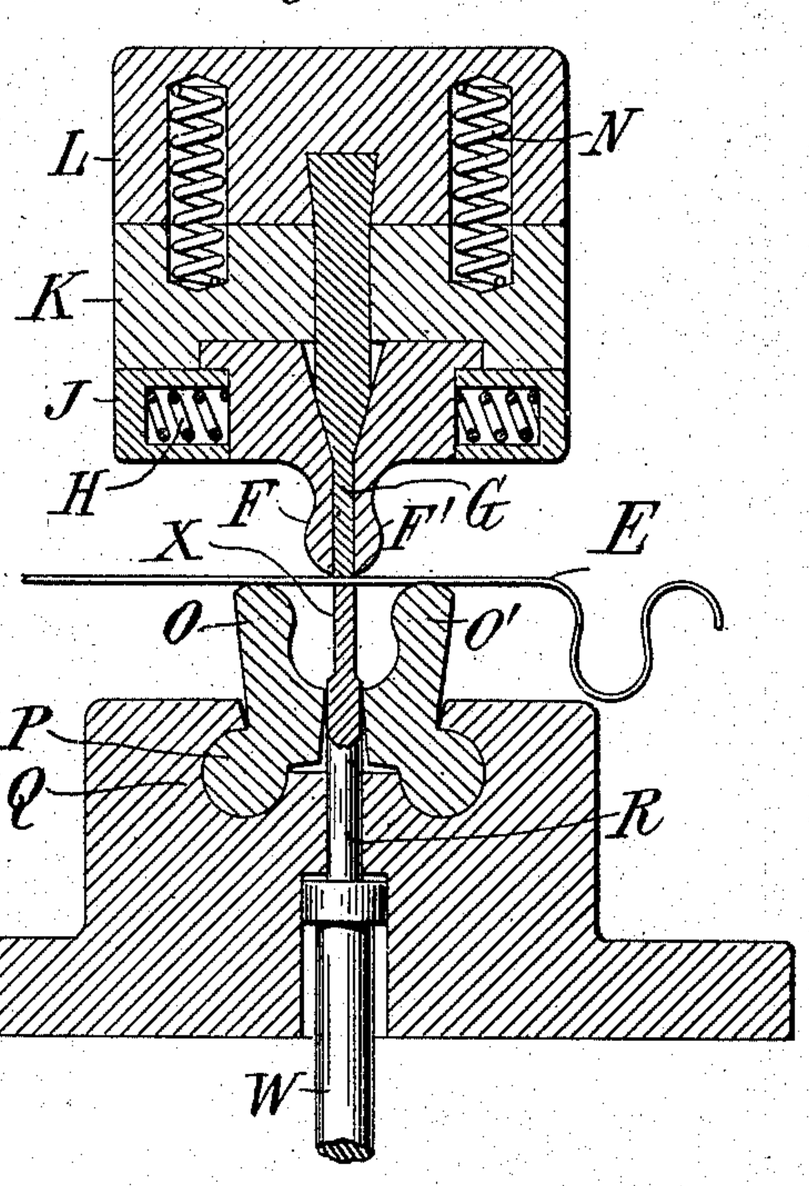
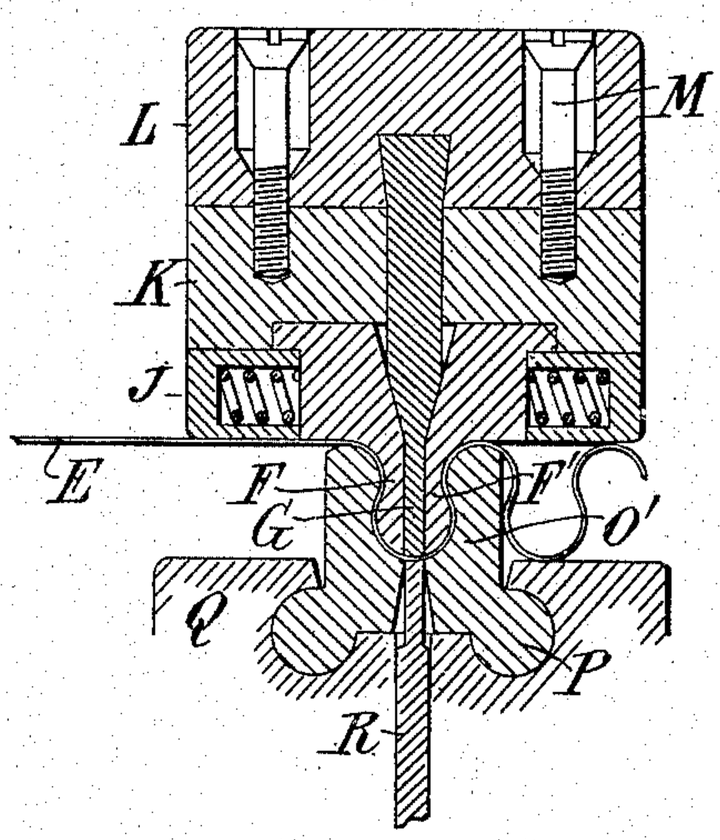


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 6.

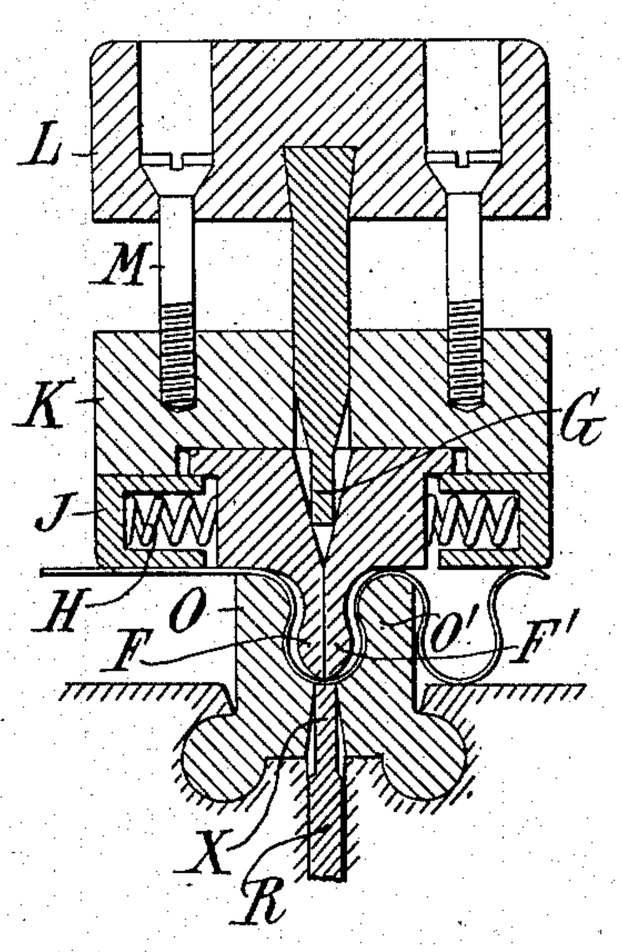
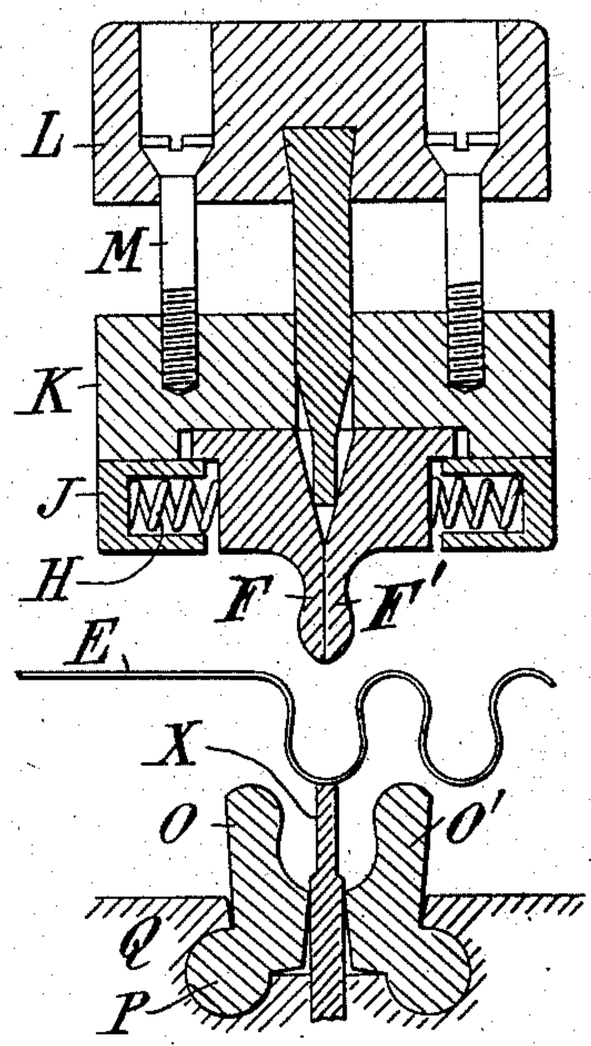


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN J. RIGBY, OF NEW YORK, N. Y., ASSIGNOR TO E. W. BLISS COMPANY, OF BROOKLYN, NEW YORK, A CORPORATION OF WEST VIRGINIA.

MACHINE FOR CORRUGATING SHEET METAL.

948,551. Specification of Letters Patent. Patented Feb. 8, 1910.

Application filed April 14, 1909. Serial No. 489,864.

To all whom it may concern:

Be it known that I, JOHN J. RIGBY, a citizen of the United States, residing in the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Machines for Corrugating Sheet Metal, of which the following is a specification.

This invention aims to provide a new machine for making corrugated sheet metal, and especially such metal with dovetailed corrugations. Metal of this sort is especially useful for the manufacture of lathing where the dovetailed shape of the corrugations serves to retain the plaster most effectively. It is adapted also for various other uses.

The accompanying drawings illustrate an embodiment of the invention.

Figure 1 is a perspective view of part of a sheet of the finished work; Fig. 2 is a front elevation of the dies used in making it, mounted on a simple press; Fig. 3 is a side elevation of the dies with the bed of the press in section to show the spring of the lower die; Figs. 4, 5, 6 and 7 are sections parallel to Fig. 2 showing successive positions of the mechanism.

Referring to the particular mechanism illustrated, A and B are respectively an upper and a lower die, which may be carried the lower one upon the bed C and the upper one upon the slide D of a press. The press shown is a simple one-revolution press; that is to say at each operation of a pedal the crank shaft makes one rotation and then stops until the pedal is again operated. The feed is by hand, and springs are depended upon for certain movements as hereinafter described in detail; but the invention may be applied to automatic presses which run continuously with automatic feed of the work and with positive movements in place of the spring movements referred to. The metal is fed to the machine in long strips of a width depending on the width of the bed of the machine from front to back (say 6 inches to 10 feet for example). At each operation of the machine a new corrugation is made, the metal being fed forward each step a sufficient distance beyond the die (see Fig. 4) to allow enough metal at the point E to be drawn back to form the far side of the bend or corrugation.

The metal is gripped between the dies A and B, each of which is composed of two parts so as to be expansible and contractible. In the initial position (Fig. 2) the upper die is contracted and the lower die expanded. The upper die is then brought down upon the work and expanded to the position shown in Fig. 4 before any substantial bending takes place. It saves power, and saves stretching the work, to expand this die before it is engaged in the bend rather than after. The lower die continues in the expanded position until the upper die presses the metal into the bottom of the former, whereupon the lower die is contracted (Fig. 5) to press the upper part of the corrugation inward against the hollow sides of the upper die, thus producing the overhanging or dovetailed shape desired. Thereafter the upper die is contracted so as to permit its removal through the narrow space within the corrugation (Fig. 6), and the lower die is expanded to permit the removal of the corrugated metal from the inturned upper portions of said die (Fig. 7). These several adjustments and movements may be effected by a variety of mechanisms. In the example of the upper die shown, the die is divided into two halves F and F′ along a line parallel with the corrugations, and these two halves are arranged to be forced apart by a wedge or key G. The half dies are pressed inward toward each other by means of springs H in blocks J of the die carrier K. The wedge carrier L is a block similar to the die carrier K and connected thereto by means of screws M, Fig. 5, (this figure being taken in a plane of section different from that of Fig. 4 for the purpose of showing these screws) which are fastened to the die carrier K and extend upward into recesses in the wedge carrier L forming guides and allowing a substantial vertical movement of the die carrier relatively to the wedge carrier. Springs N are also arranged between the two carriers K and L tending to press them always apart and located in vertical sockets in the carriers. In the position of Fig. 1 the die carrier K is pressed downward as far as possible below the wedge carrier, so that the wedge is withdrawn from between the two halves of the die, and these two halves are pressed toward each other to contract the die by means of the springs H. When

the two carriers K and L are pressed toward each other as in Fig. 4, the wedge G expands the die.

In the lower die B illustrated, the die is composed of two halves O and O′, also divided parallel with the corrugations, and each half is provided with a cylindrical rib P on its outer lower corner which is arranged in a corresponding socket in the die carrier Q, so as to permit each half of the die to pivot about said corner, and thus to cause the expanding and contracting of the die, and especially of its upper portion, since the latter is farthest away from the pivot points. The lateral positions of the pivots causes the contracting of the die without the necessity of any special mechanism for the purpose whenever the upper die moves downward and presses against the bottom of the lower die.

The two halves O and O′ of the lower die are held apart until the time when they are to be contracted by means of a wedge or key R, located on the line between them and pressed upward by any suitable means, such as the rubber spring S shown in Fig. 3, and which is supported upon a plate T carried by a rod U fastened under the bed C of the press. The rubber spring S bears upward against a plate V carrying pins W which engage the under side of the key R. Projecting upward from the edge of the key R are one or more projections X, approximately equal in height to the depth of the die, so that their upper ends lie on a level with the upper edges of the die.

These devices serve several purposes. When the upper die comes down to the point shown in Fig. 4, it is supported there by the projections X until the wedge G has been forced in between the two halves of the die to expand it. The wedge G and the upper die being then moved down positively, carry the projections X, and with them the keys downward to such a point that the key no longer interferes with the contraction of the lower die; and the continued movement of the upper die causes the lower die to contract in the manner previously explained. On the return movement the projections X serve as an ejector to lift the work out of the lower die in the manner indicated in Fig. 7.

After the work is removed from the machine it shows a tendency to gradually reduce the overhang of the corrugations. This tendency may be allowed for by making the overhang greater in the dies A and B than is to be finally desired.

Where it is desired to do the work automatically and rapidly, positive means may be substituted for the springs N and S. In such machine also the lower dies or the rear one of them may be lowered after each operation so as to permit the feed to continue without lifting the stock.

What I claim is:—

1. A machine for forming dovetailed corrugated sheet metal comprising expansible and contractible inner and outer dies, a stop for retarding the advancement of the inner die, means acting by a movement toward the outer die for expanding the inner die while held by said stop, and means for advancing the inner die.

2. A machine for forming dovetailed corrugated sheet metal comprising an expansible lower die, a key for holding the same expanded, said key being removed from its operative position upon the pressing of the metal into said die so as to permit the contraction thereof.

3. A machine for forming dovetailed corrugated sheet metal comprising an inner die, an outer die, the latter comprising two halves O and O′ pivoted at their lower outer corners, a key R for holding the parts O and O′ separated, and a projection X upon the key R adapted to be engaged and moved downward by the downward movement of the inner die, so that such movement withdraws the key R and the pressure of the inner die upon the bottom of the outer die brings the parts O and O′ of the latter together.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN J. RIGBY.

Witnesses:
D. ANTHONY USINA,
FRED WHITE.