(No Model.) 2 Sheets—Sheet 1.

C. T. REMUS.

MACHINE FOR MAKING METAL CORNER FASTENINGS FOR BOXES.

No. 417,337. Patented Dec. 17, 1889.

Fig. 1

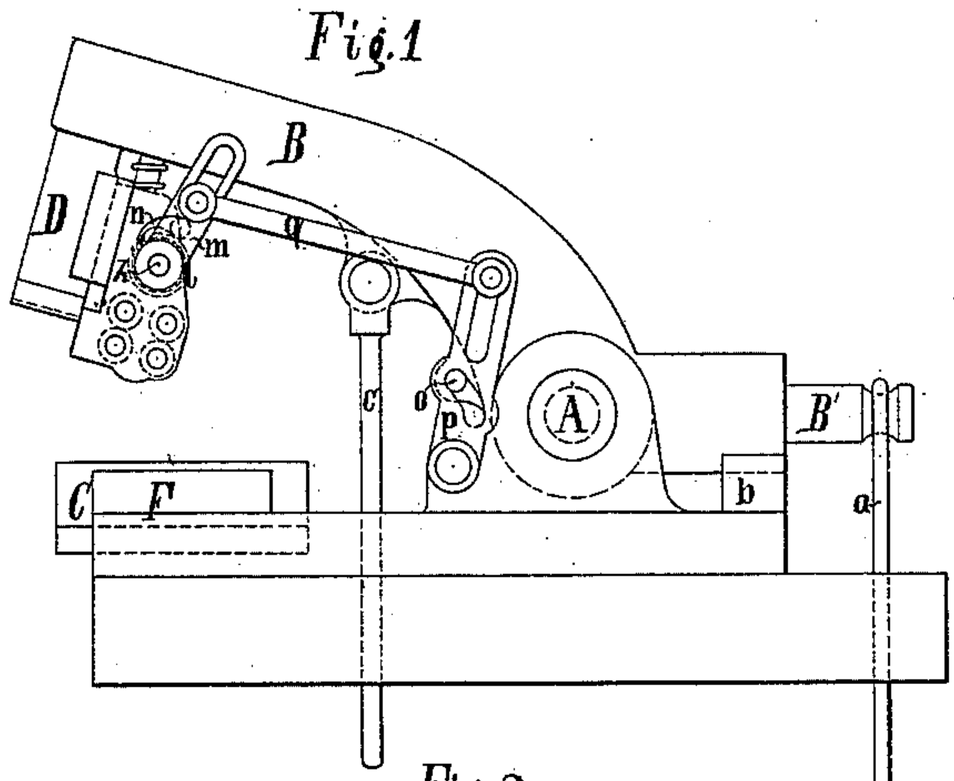


Fig. 5

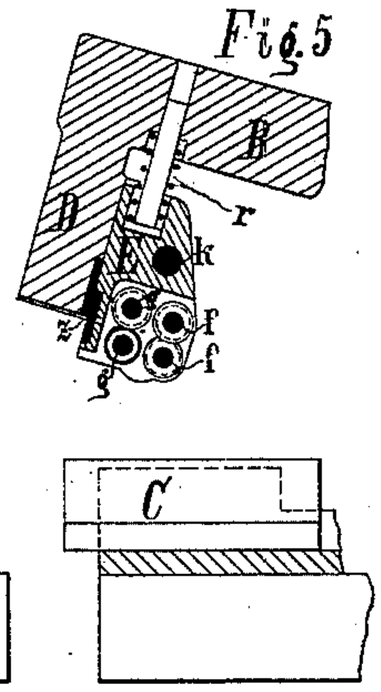


Fig. 9

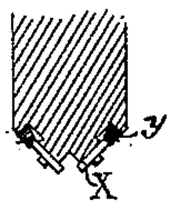


Fig. 2

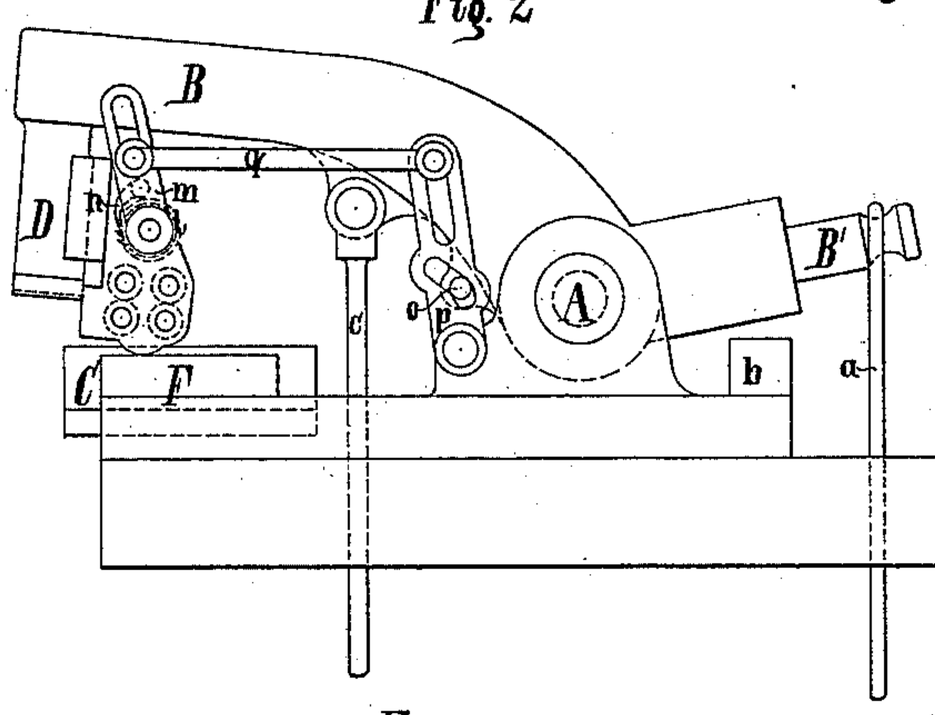


Fig. 6

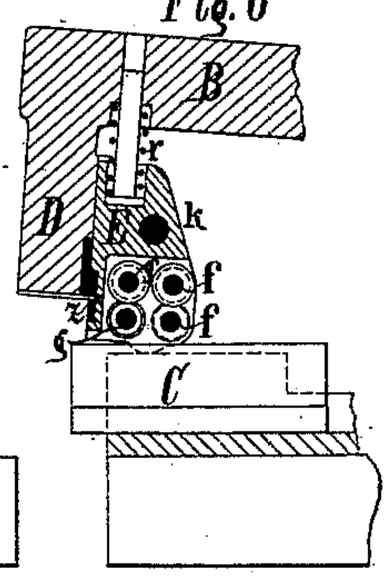


Fig. 8

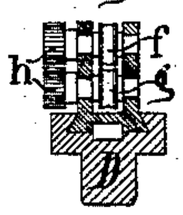


Fig. 4

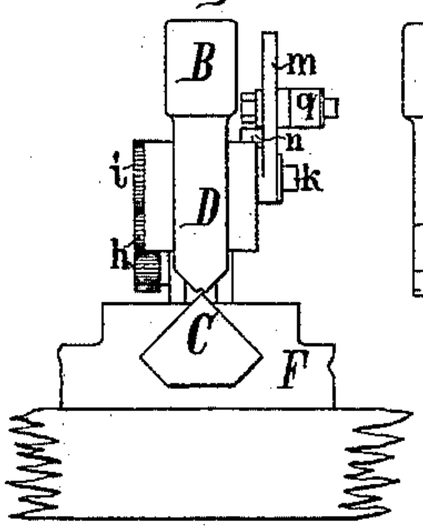


Fig. 3

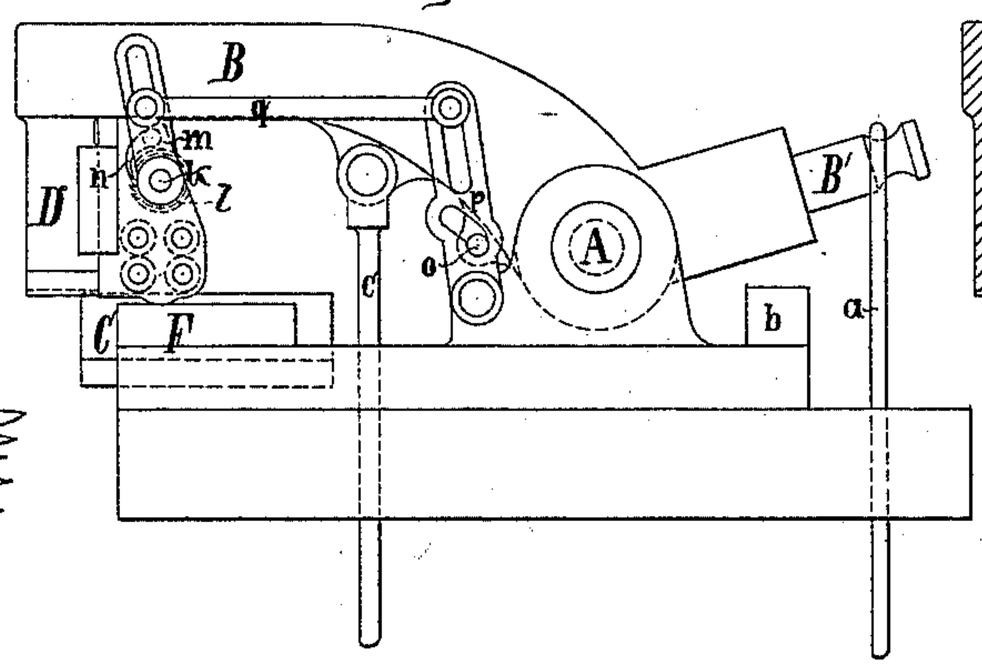
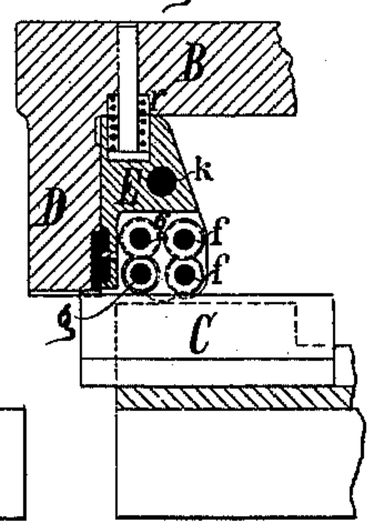


Fig. 7



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(No Model.) 2 Sheets—Sheet 2.

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MACHINE FOR MAKING METAL CORNER FASTENINGS FOR BOXES.

No. 417,337. Patented Dec. 17, 1889.

Fig. 10

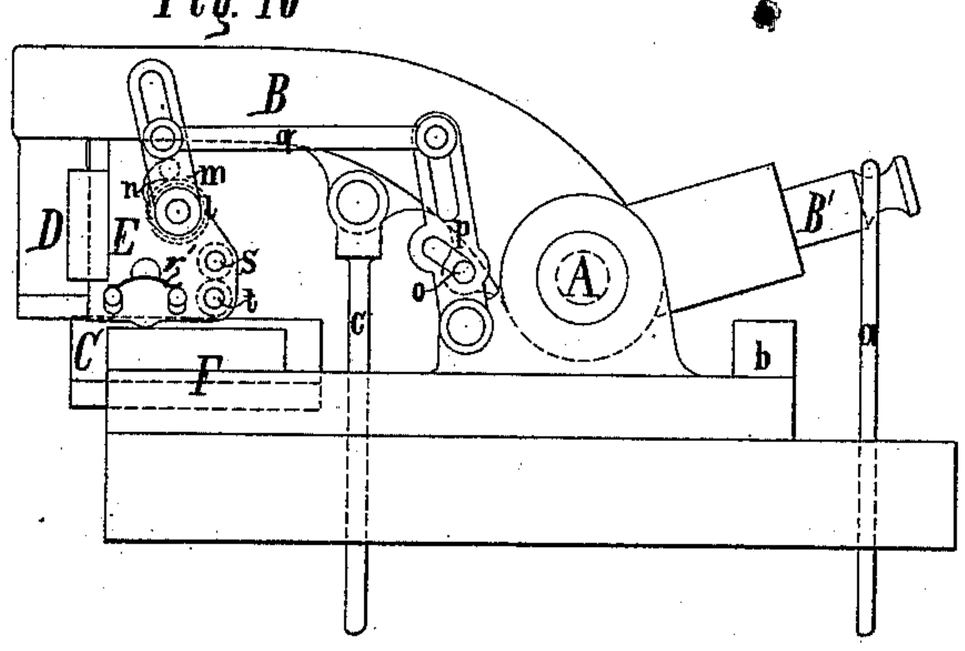

Fig. 11

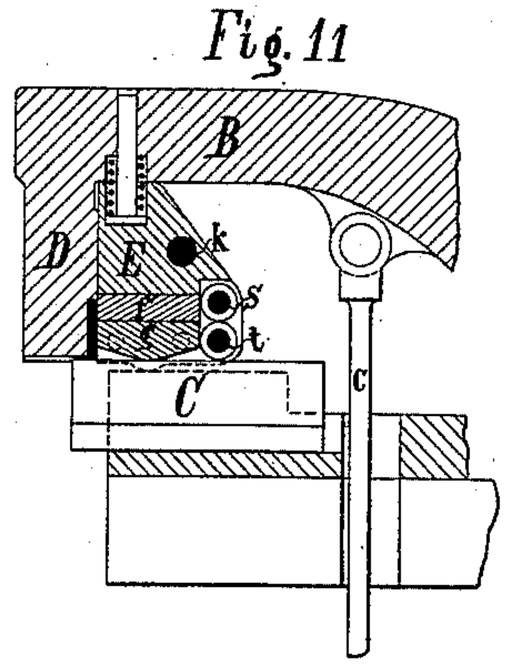

Fig. 12

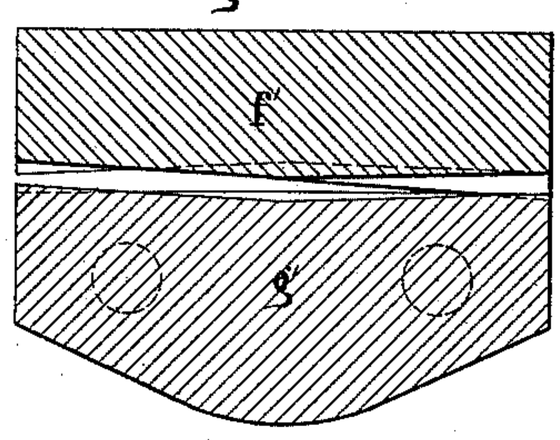

Fig. 13

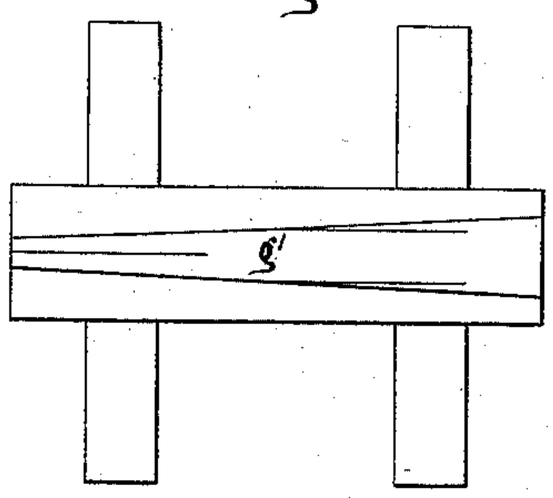

Fig. 14

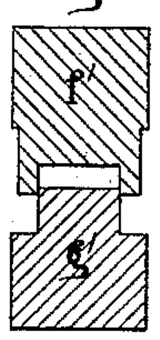

Fig. 15

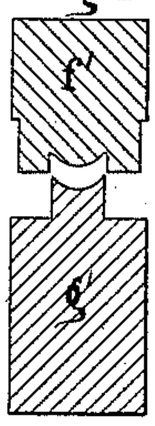

Fig. 16

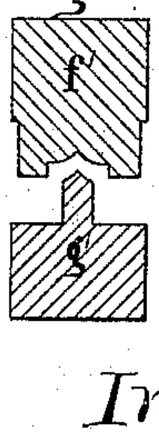

Fig. 17

Fig. 18

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UNITED STATES PATENT OFFICE.

CARL TEODOR REMUS, OF DRESDEN, SAXONY, GERMANY, ASSIGNOR TO JEAN SCHERBEL, OF SAME PLACE.

MACHINE FOR MAKING METAL CORNER-FASTENINGS FOR BOXES.

SPECIFICATION forming part of Letters Patent No. 417,337, dated December 17, 1889.

Application filed September 20, 1887. Serial No. 250,229. (No model.) Patented in Germany May 10, 1887, No. 42,444; in England May 28, 1887, No. 7,807; in Belgium July 14, 1887, No. 78,203; in France July 15, 1887, No. 184,818, and in Austria-Hungary December 7, 1887, No. 22,307 and No. 58,233.

To all whom it may concern:

Be it known that I, CARL TEODOR REMUS, a subject of the Emperor of Russia, and a resident of Dresden, in the Kingdom of Saxony, in the Empire of Germany, have invented certain new and useful Improvements in Machines for Making Metal Corner-Fastenings for Boxes of Paper, Pasteboard, Wood, or Similar Material, (patented in Germany, No. 42,444, May 10, 1887; in England, No. 7,807, May 28, 1887; in Belgium, No. 78,203, July 14, 1887; in France, No. 184,818, July 15, 1887, and in Austria-Hungary, Nos. 22,307 and 58,233, December 7, 1887,) of which the following is a specification.

My present invention consists of a machine for the manufacture of cramps and corner-pieces from sheet metal, particularly such as described in Patents Nos. 329,081 and 343,340. This machine is designed to shape serrated strips of sheet metal into cramps and corner-pieces, to cut them to the required length, and to effect the connection of the corners or sides of boxes, &c., by means of such cramps. In some cases the machine may also be used for producing the serrations of the strips of sheet metal. The machine is designed so that it can be used in manufacturing the said cramps on a large scale; but in a simpler form it may also be used with advantage by small makers.

In the accompanying drawings, Figures 1 to 4, Sheet I, represent four views of the machine. Figs. 5 to 9, Sheet I, represent details of same in section. Fig. 10, Sheet II, represents a modified form of the machine. Figs. 11 to 16, Sheet II, represent details of same in section. Figs. 17 and 18, Sheet II, represent sections of the metal strip.

The machine has essentially the form of an angle-hammer, as shown in Fig. 1.

D is the hammer-head, solid with the lever B or firmly fixed to it. The latter is pivoted on the pin A and continued beyond it as an arm B′, which, when the machine is at rest, bears on a saddle *b*, and is held in this position by means of a rod *a* and a spring or weight. Between the pivot and hammer-head a rod *c* is attached to the hammer lever or shaft connected to a treadle or crank, and by which the descent of the hammer is effected. Below the hammer-head and sliding between cheeks F is situated the anvil C, which is roof-shaped with suitable pitch when corner-connections are to be made and flat when flat surfaces are to be connected. On that side of the hammer-head which is nearest to the pivot A there is, sliding between cheeks, a slide E, Fig. 5, which receives in the recess at its lower part the tools for effecting the shaping of the strips of sheet metal. This slide E is maintained in position by a spiral spring *r*, surrounding a bolt or pin, guided partly in a cylindrical recess of the slide and partly in a recess of the hammer-head. The face of the hammer D has a recess, when edge-connections are to be made, corresponding to the angle of the edge. The front of the slide has a slot *z* in the direction in which the metal strip leaves the tools and corresponding to the section of the produced cramp. The contact-faces of the hammer are steel-clad. The before-mentioned slot passes through the steel plate of the slide. When the hammer descends by means of the before-mentioned rod *c*, the shaping of the metal strip and the passage of the finished part of the latter through the slot are effected as described hereinafter. When the lower edges of the sides of the slide E touch the anvil-cheeks F, Fig. 6, the movement of the slide is stopped. Then the slide E slides along the back surface of the hammer, so that the latter cuts off with its back edge the cramp protruding from the slot of the slide. Then the hammer strikes immediately on the anvil C, Fig. 7, which has been moved forward according to the length of the edge-connection to be produced, and hammers the cut-off cramp onto the part of the box which has been previously placed on the anvil. When this has been done, the hammer returns into its former position by means of the rod *a*, the slide E makes a movement opposite to that it made

before by the recoil of the spring *r*; and the machine is ready for a repetition of the described operation.

In order that the cramp cut off by means of the movement of the slide E shall be retained on the face of the hammer, the oblique surfaces of the latter are provided with small plates X, Fig. 9, which hold the cramp between their lower ends, protruding somewhat over the edges of the recessed hammer-face. When the hammer reaches the anvil, these plates X touch the latter first, and are pressed back on their bearing by the stroke. When the connection has been made and the hammer recedes, the plates X are pushed forward into their former position by means of the flat springs *y* behind them.

The tools for shaping the metal strips placed in the lower recess of the slide E may be either in the form of rollers, as shown on Sheet I, or they may be partly rollers and partly stamps, (dies,) as shown on Sheet II. In the former arrangement the recess of the slide E holds the pair of rollers *f f*, which prepare the metal strip, and the pair *g g*, which finish it.

The rollers are operated by the following mechanism: On the foundation of the angle-hammer is situated the lever *p* at the side of the pivot A, Figs. 1, 2, and 3, which, when the hammer descends, makes a throw by means of the pin *o*, situated on the hammer-shaft B, the pin gearing into a slot of the lever. This throw is transmitted, by means of a rod *q*, to a lever *m*, situated loose on its axis *k* above the pairs of rollers, Fig. 4. Behind the lever *m* is fixed on the axis *k* a ratchet-wheel *l*, and on the other side of the slide is situated a cogged wheel *i*, Fig. 4. The pawl *n*, gearing into the ratchet-wheel, is linked or pivoted to the lever *m*. The throw of this lever is transformed into a rotation of the cog-wheel *i*, which is transmitted to the pairs of rollers by means of wheels *h*, situated on their axes. In this manner every descent of the hammer effects the rotation of the pairs of rollers necessary for the shaping and passage of the metal strip introduced between the rollers *f f*.

To stop the rotation of the rollers as soon as the slide has reached the cheeks F of the anvil, the lower part of the slot in the lever *p*, which receives the pin *o*, is shaped so that the latter part of the movement of the hammer shall not affect this lever.

To allow of the regulation of the throw of the lever *m* according to the length of the passage of the metal strip, the points of attachments of the rod *q* are adjustable by means of slots which receive the side pins of the rod. Figs. 1, 2, and 3 show the position of the rod *q* corresponding to the maximum throw.

When the tools for shaping the metal strip are partly rollers and partly dies, dies *f′ g′* are situated behind the rollers *s t*, Figs. 10 and 11, Sheet II, of which the upper is fixed and the lower has a small vertical travel. The dies (shown in longitudinal section in Fig. 12, in plan in Fig. 13, and in cross-section in Figs. 14, 15, and 16, Sheet II) are formed so that the end where the metal strip enters is of the shape of the latter, the shape of the die gradually changing until it corresponds to that of the cramp to be produced.

Fig. 14 shows the section of the die where the metal strip enters, Fig. 15 the section in the middle, and Fig. 16 the section just before the exit of the strip, which leaves the dies in the shape represented by sectional view, Fig. 18. In this arrangement the pair of rollers *s t* is only for the purpose of guiding and feeding the metal strip. The dies reach to the front of the slide, the upper edge of the lower die-plate *g′* serving also as the edge of a shearing-cheek to cut off, as before, in combination with the back edge of the hammer-head, the produced cramp when the hammer has descended so far that the slide E rests on the cheeks of the anvil. When this has been effected, the lower die-plate *g′* moves upward under the pressure of the anvil, whereby the metal strip is pressed or clamped between the cheeks during the cutting off. A flat spring *r′*, Fig. 10, attached to the outer surface of the slide and acting upon pins on the plate *g′*, Fig. 10, presses the latter away from the plate *f′* when the hammer has commenced its return travel and left the anvil.

The feeding-rollers *s t* are operated by the same arrangement as before.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. A machine for the manufacture of cramps from strip sheet metal and for effecting connections by the said cramps, consisting of an angle-hammer operated by a crank or treadle against spring reaction and carrying a shearing-piece sliding at the back of the hammer-head, an automatically-operated roller-feed and dies to form and feed the metal strip, and an anvil operating the shearing-piece and coacting with the hammer, substantially as hereinbefore specified.

2. The combination of the angle-hammer B B′ D and a shearing-piece E, sliding on the hammer-head, with the rollers *s t* and dies *f′ g′*, and the anvil C, adjustable between cheeks F, substantially as hereinbefore specified.

3. The combination, with the face of the hammer, of small plates X, which grip the cut-off cramp, and springs *y*, which bring the plates X into their former position after the cramp has been hammered on the parts to be united, substantially as specified.

4. The angle-hammer B B′ D, carrying a slide E and a roller-feed, and the anvil C, in

combination with a pin *o* on the hammer-shaft B, a slotted lever *p*, a rod *q*, a slotted lever *m*, with pawl *n*, ratchet-wheel *l*, and wheel *i* on the pin *k* of the slide E, and the wheels on the axes of the rollers to effect the feed of the strip during each descent of the hammer, substantially as specified.

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

CARL TEODOR REMUS.

Witnesses:

PAUL DRUCKMÜLLER,

MAX KLIPPHAHN.