(No Model.) 4 Sheets—Sheet 1.

C. T. REMUS.

MACHINE FOR MAKING JOINT FASTENINGS.

No. 400,792. Patented Apr. 2, 1889.

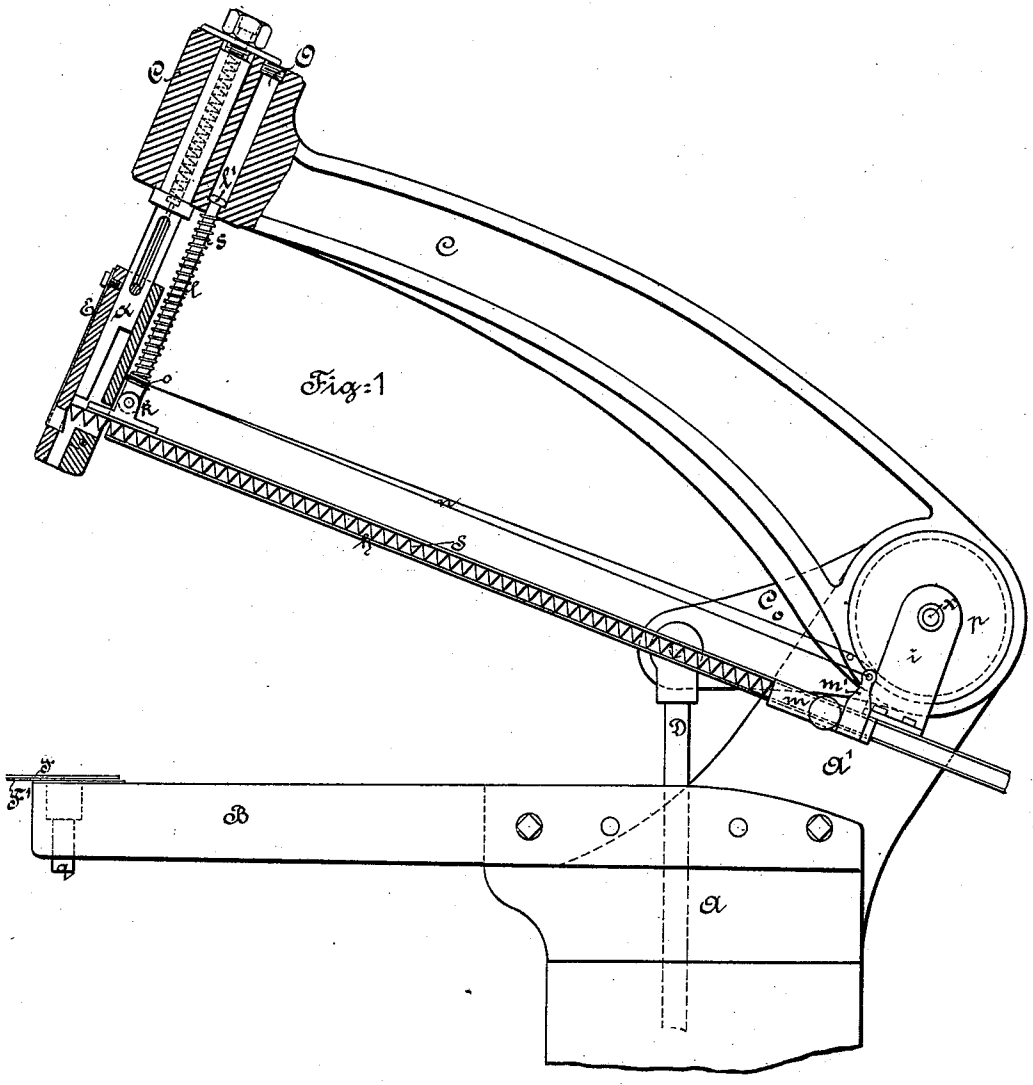

Fig. 1

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Fig. 2

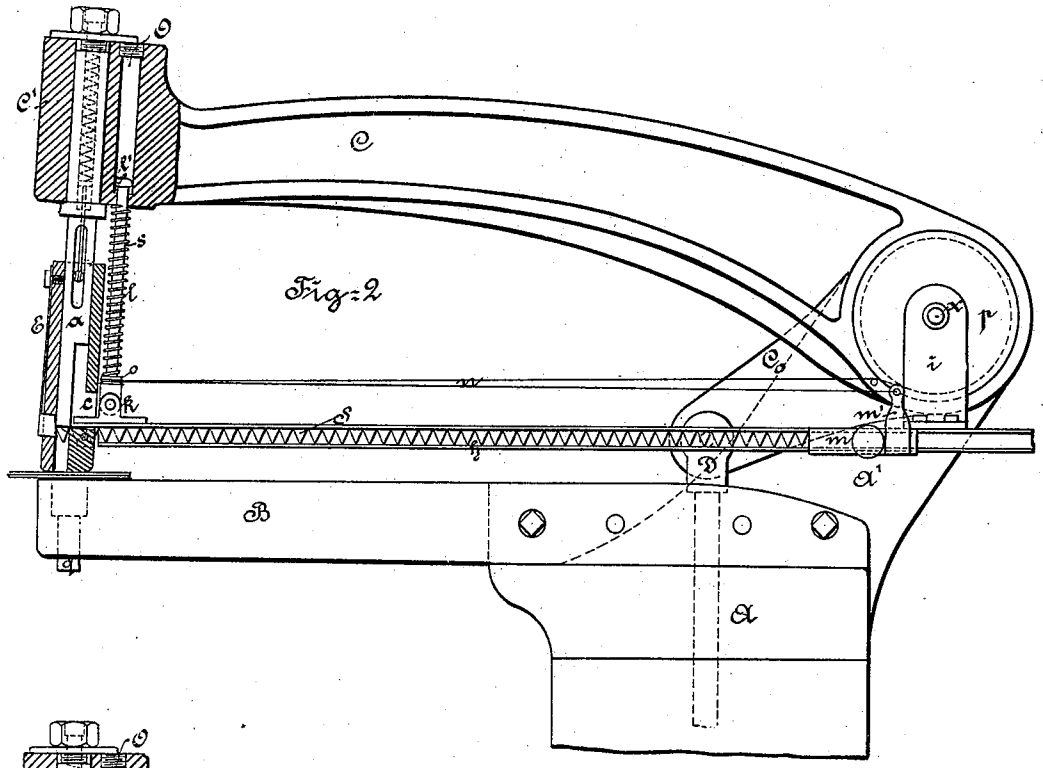
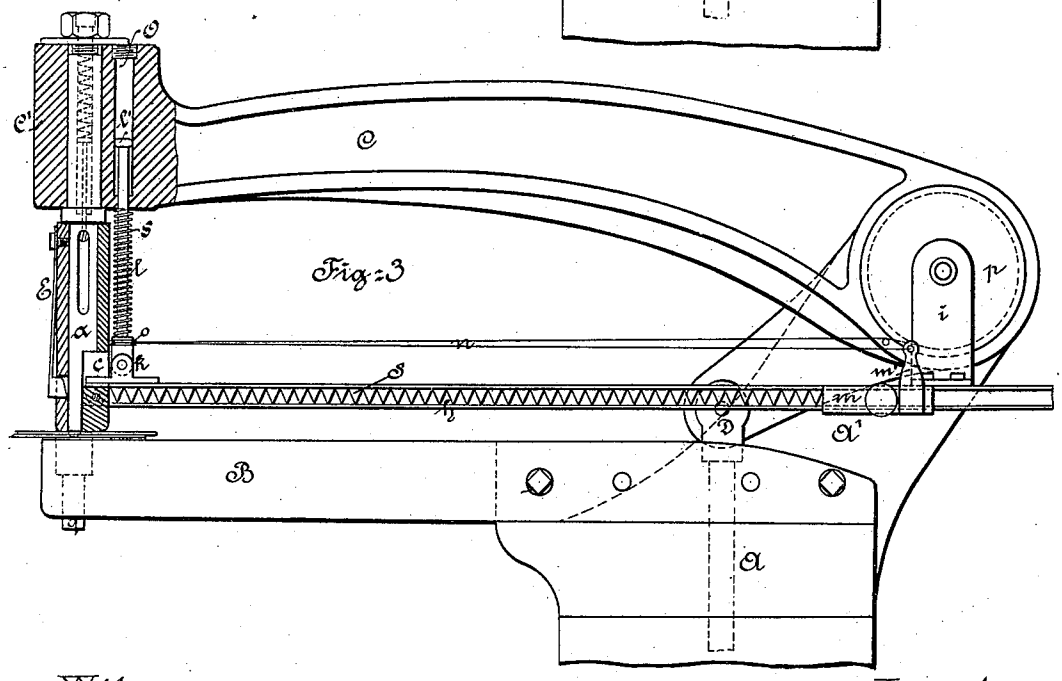


Fig. 3



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(No Model.) 4 Sheets—Sheet 3.

C. T. REMUS.

MACHINE FOR MAKING JOINT FASTENINGS.

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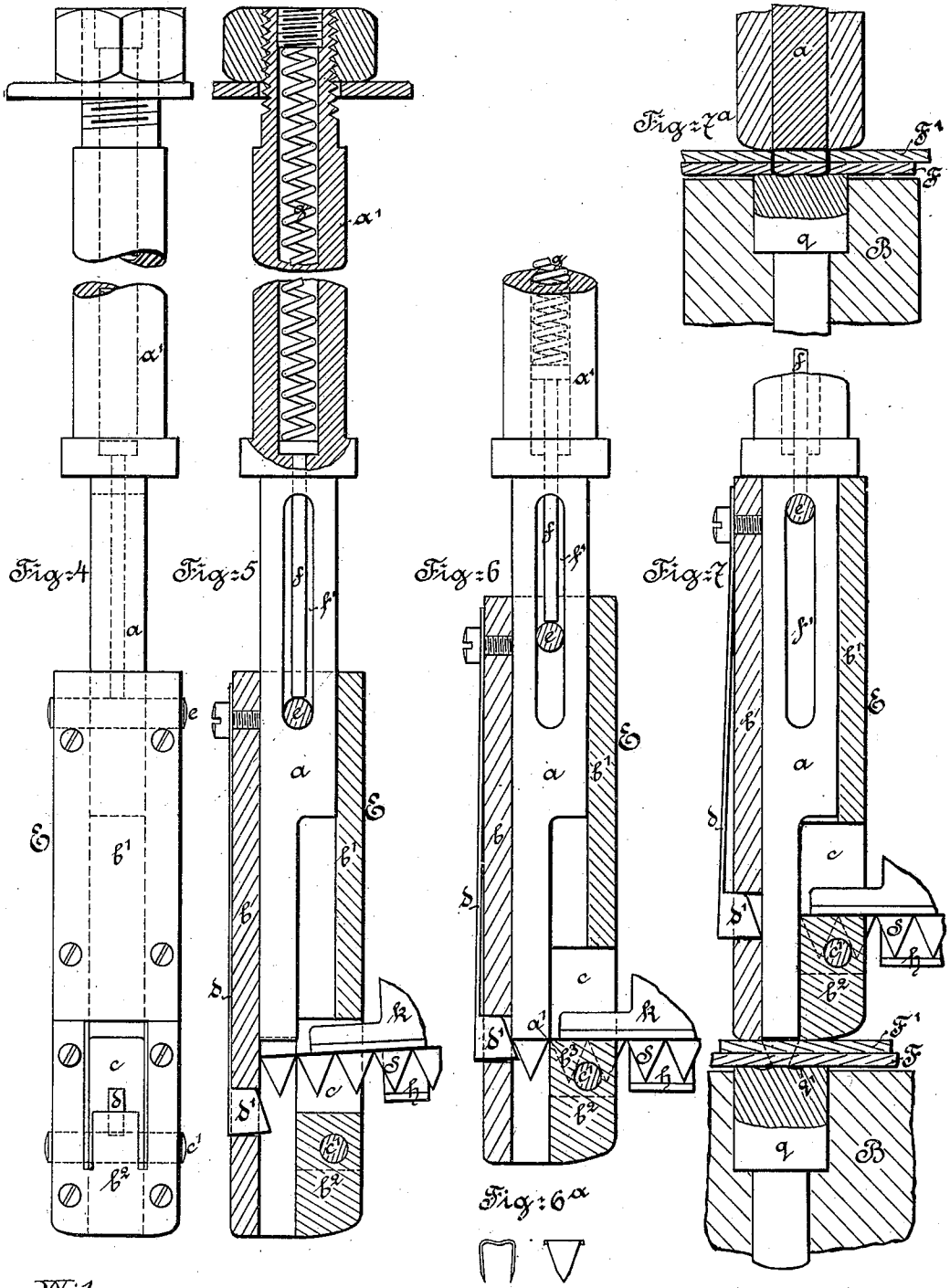

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(No Model.) 4 Sheets—Sheet 4.

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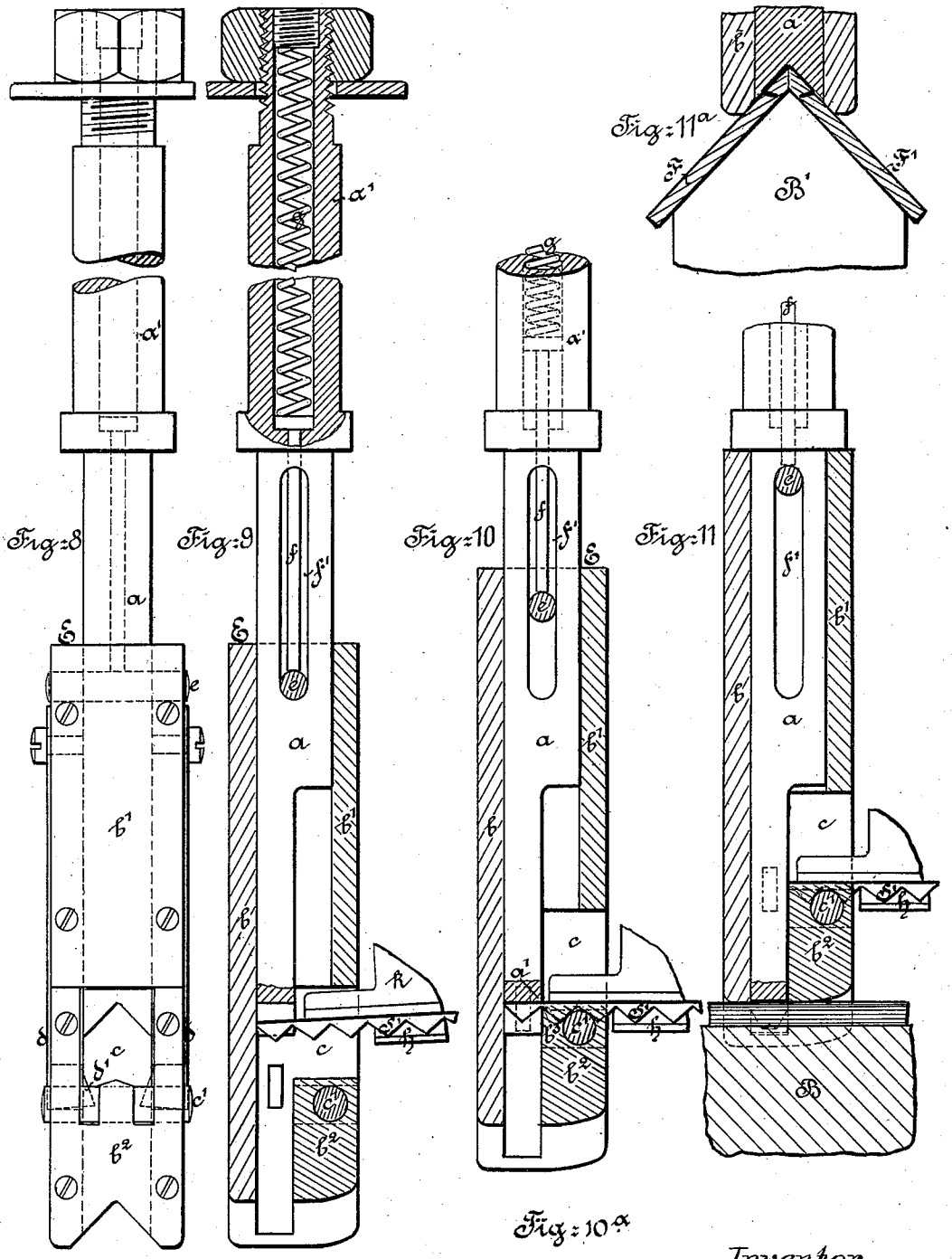
MACHINE FOR MAKING JOINT FASTENINGS.

No. 400,792. Patented Apr. 2, 1889.



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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 JOINT-FASTENINGS.

SPECIFICATION forming part of Letters Patent No. 400,792, dated April 2, 1889.

Application filed October 30, 1888. Serial No. 289,531. (No model.) Patented in Germany April 30, 1887, No. 41,313, and 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, residing at Dresden, in the Kingdom of Saxony, German Empire, have invented an Improved Machine for Making Metal Joint-Fastenings for Boxes, (patented in Germany, No. 41,313, April 30, 1887, and No. 42,444, May 10, 1887; England, No. 7,807, May 28, 1887; Belgium, No. 78,203, July 14, 1887; 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.

The object of this invention is to cut off pieces of sheet metal, which are known as "sheet-metal cramps," and to hammer them onto sheets or plates of card-board, leather, thin wood, &c., in order to effect a connection between the latter. The sheet-metal strips are provided with teeth or projections on the edges and are stamped to correspond to the section of the required cramp. The sheets or boards may overlap one another, or they may be butted against one another at an angle. In the former case flat surface-connections are effected and in the latter case edge or corner connections—such, for instance, as are required in the manufacture of boxes.

Referring to the accompanying drawings, Figures 1, 2, and 3 are three views of the machine at different periods of its operation, and Figs. 4 to 11ª are details of the machine.

The machine consists, first, of parts for effecting the cutting off and hammering on of sheet-metal cramps to parts to be connected, and, secondly, of parts which serve to feed into the machine the serrated and stamped sheet-metal strip from which the cramps are to be cut. These arrangements or devices are as follows:

Arrangements for cutting off and hammering on the metal cramp.—Between the arms A′ on the base or stand A of the machine (partially shown in Fig. 1) is pivoted on the axis *x* a strong lever, C, which may be moved downward by any suitable means—for instance, by a counterweighted treadle acting upon the lever through a rod, D, attached to the arm C° of the lever C. In the bossed head C′ of this lever is fixed a die, *a*, Figs. 1, 4, and 5, on which slides a sleeve, E. The latter consists of a strong trough-shaped piece, *b*, and two plates, *b′* and b^2, which cover the open side of the piece *b*, (turned toward the axis or pivot of the lever,) and thus complete the sleeve. (See Figs. 4 and 5.) Transversely through the head of *b* runs a bolt, *e*, the center part of which (*i. e.*, the part situated between the walls of the sleeve) is situated in an elongated slot, *f′*, placed axially in the die *a*. Within this slot *f′* and on the bolt *e* rests a rod, *f*, on the head of which bears a spiral spring, *g*, placed in the bore or hole of the fixing-pin *a′*, the other end pressing, when the spring is being compressed, against the plug *a*. (See Figs. 4 and 5.) The movement of the piece *b*, during which the bolt *e* slides in the guiding-slide *f′*, is therefore effected against the reaction of the spiral spring *g*. In the plate b^2 is a recess, which allows the sheet-metal strip from which the cramp is to be cut to enter into the interior of the sleeve, the lower part of such recess being shaped according to the section of the strip. To the head of the piece *b* is fixed a flat spring, *d*, Fig. 5, which runs along the outer surface of the sleeve and ends in a small block, *d′*, which enters a recess in the wall of the sleeve so far that its hinder wedge-shaped side protrudes somewhat over the inner face of the sleeve. Instead of one spring, *d d′*, there may be two or three. If two, they are situated on the sides or wings of the piece *b;* if three, one is situated on the central part of *b* and the other two on the sides.

If the machine is to be used for effecting flat connections, there is fixed to the stand A a flat table, B, into which is fixed a cylindrical steel pin, *q*, which forms the matrix for the die *a*. Into the upper face of the same is turned a concentric groove, *q′*. (See Figs. 1 and 7.) The face of the die *a* and the lower face of the sleeve E are flat. On the other hand, if the machine is to be used for effecting corner connections, a beam, B′, is used, (instead of the flat table B,) the upper part of which is Λ-shaped. (See Fig. 11ª.) The face of the die *a* and the lower face of the sleeve

E are recessed to correspond to the angle of the beam B′. (See Figs. 8, 9, 10, and 11ª.)

Arrangements for feeding the sheet-metal strip.—The sheet-metal strip S, to be fed into the machine, Fig. 1, is taken up by a groove, *h*, one end of which is borne by the angle-piece *i*, situated on the pivot *x*, the other end—namely, that near the sleeve E—being carried by a rod, *l*, fitted with a spiral spring, *s*, and sliding in the bore or hole O of the lever-head C′. (See Fig. 1.) The rod *l* is hinged to the groove *h* by means of a hinge, *k*. In the groove *h* slides a feeder, *m*, through a hole in the arm *m′* of which is drawn a cord, which is led round a disk, *o*, on the before-mentioned rod *l*, and then back to a drum, *p*, situated on the axis *x* of the lever C. (See Fig. 1.) This drum contains a watch-spring, which tends to rotate it in the direction corresponding to the winding up of the cord. When the rotation takes place, it effects, by means of the cord *n*, a movement of the feeder *m* in the direction toward the die *a*, thus feeding the metal strip into the sleeve E. A bolt, *c′*, through the plate b^2 of the sleeve E (see Figs. 4 and 5) serves for adjusting the position of the sheet-metal strip S within the sleeve, and its action will be explained hereinafter.

Action of the machine.—When the machine is placed ready for operation, Fig. 1, the sleeve E is in its lowest position, Figs. 1, 4, and 5, while the sheet-metal strip protrudes so far into the sleeve that its front end touches the inner wall of *b*. When then the die is depressed by the lever C or other means, the sleeve E strikes the boards F F′, placed on the table for the purpose of being connected, and is thereby stopped in its travel, while the die *a*, rod *l*, and hinge *k*, with the front part of the feed-channel *h* and the front end of the sheet-metal strip S supported by it, continue their descent. In consequence the front end of the sheet-metal strip S descends within the recess *c* of the plate of the sleeve b^2 until it reaches the lower edge of the recess *c*, and is thus stopped simultaneously with the hinge *k*, the rod *l*, and the feed-channel *h*. Before this has taken place the bolt *c′* of the plate b^2 has entered two opposite serrations of the strip S and has adjusted the position of the latter so that there is in the hollow of the sleeve a piece of sheet-metal strip of exactly the same length as the width of one tooth of the strip, as shown in Fig. 6, (or, if cramps with two teeth on each side are to be cut off, the length of piece of sheet-metal strip will correspond exactly to the width of two teeth.) When the sheet-metal strip is stopped, the die *a* has advanced so far within the sleeve that its face touches the upper surface of the sheet-metal strip. (See Fig. 6.) When, now, the die *a* continues its travel, its edge *a′* and the edge b^3 of the recess *c* act jointly as shearing-edges and cut off from the sheet-metal strip a piece in form of a sheet-metal cramp, as shown in two elevations and plan in Fig. 6ª for flat connections, and in Fig. 10ª for corner connections. In order to prevent the cramp from getting out of its true position while being cut off, its front edge is supported by the wedge-shaped face of the small block *d′* of the flat spring *d*. When cramps for corner connections are being made, it may be advisable to use two flat springs, *d*, with blocks *d′* sidewise to give support to the sides of the cut-off cramp. (See Figs. 8 and 9.) When the lever C is nearing the end of its throw, the die *a*, pressing back the block *d′*, feeds the cramp before it and hammers the same at the end of its travel onto the boards F F′, placed on the table B over the matrix *q*, which are to be connected. The teeth of the cramps are thereby forced to penetrate the boards until their points protrude through the other side, where they meet the groove *q′* of the matrix *q* and are guided through the groove, so that when the connection has been effected the two points of the cramp-teeth are turned toward each other and have cut to some extent into the board F′, as shown in Fig. 7ª. When then the ascending motion commences, the sleeve E is at first retained in its present position by the spring *g*, which during the foregoing operation has been pressed together, while the die *a* ascends with the lever C, the bolt *e* of the sleeve sliding within the slot *f′* of the die *a*. At the same time the feed-channel *h* is kept in its position by the spiral spring *s*, surrounding the rod *l*, until the head *l′* of the latter strikes against the bottom of the hole O in the lever C. Then the rod *l*, and with it the hinge *k*, and the front part of the feed-channel *h*, with the sheet-metal strip S, commence to take part in the upward movement of the lever C, the sleeve E remaining still at rest, because the bolt *e* has not yet touched the end of the slot *f′*. Only when this has taken place does the sleeve E join in the ascent of the lever C. During the ascent of the end of the metal strip S, and while the sleeve E remains in its position, the former is drawn so far up in the recess *c* of the plate b^2 that the recess allows the sheet-metal strip to again enter the sleeve. Now the sheet-metal strip is fed forward by the feeder *m* until its front edge touches the inner wall of the piece *b*. The machine is then again in the position shown in Fig. 1, and the cutting off and hammering on can be proceeded with afresh.

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

1. In a machine for cutting off and hammering on sheet-metal cramps to effect connections between sheets of material, the combination of a die, movable upward and downward and having its face plain or recessed, with a sleeve, E, sliding on the die against the reaction of a spiral spring, and consisting of a trough-shaped piece, *b*, and the covering-plates *b′* and b^2, the latter having a recess, *c*, for the entrance of the sheet-metal strip into the sleeve E, and with a flat anvil, B, sup-

plied with a matrix, *q*, or with a beam-like anvil, B′, having the shape of an inverted **V**, all substantially as set forth.

2. In such a machine, the combination of the covering-plate b^2 with a guiding-bolt, *c′*, passed through it and adjusting the position of the sheet-metal strip, substantially as and for the purpose specified.

3. In such a machine, the combination of a bolt, *e*, passed through the piece *b* of the sleeve E and sliding in the slot *f′* of the die *a*, with a rod, *f*, on the head of which acts the spring *g*, situated in the hollow fixing-pin *a′* of the die *a*, and pushing forward the sleeve E, substantially as set forth.

4. In such a machine, the matrix *q*, with a concentric groove, *q′*, in its face, substantially as shown, and for the purpose specified.

5. In such a machine, the combination of the sleeve E with a feed-channel, *h*, guiding the sheet-metal strip, and attached to the lever-head C′, carrying the die *a*, by means of a rod, *l*, with a head, *l′*, held in a hole of the lever-head and surrounded by a spiral spring, *s*, and hinged by a hinge, *k*, to the groove *h*, substantially as set forth, and for the purpose described.

6. In such a machine, the combination of the feed-channel *h* with a feeder, *m m′*, communicating, by means of the cord *n*, led around the disk *o* on the rod *l*, with a drum, *p*, containing a watch-spring, and situated on the axis *x* of the lever C, carrying the die, substantially as and for the purpose set forth.

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 KLIPPHALM.