

(No Model.)

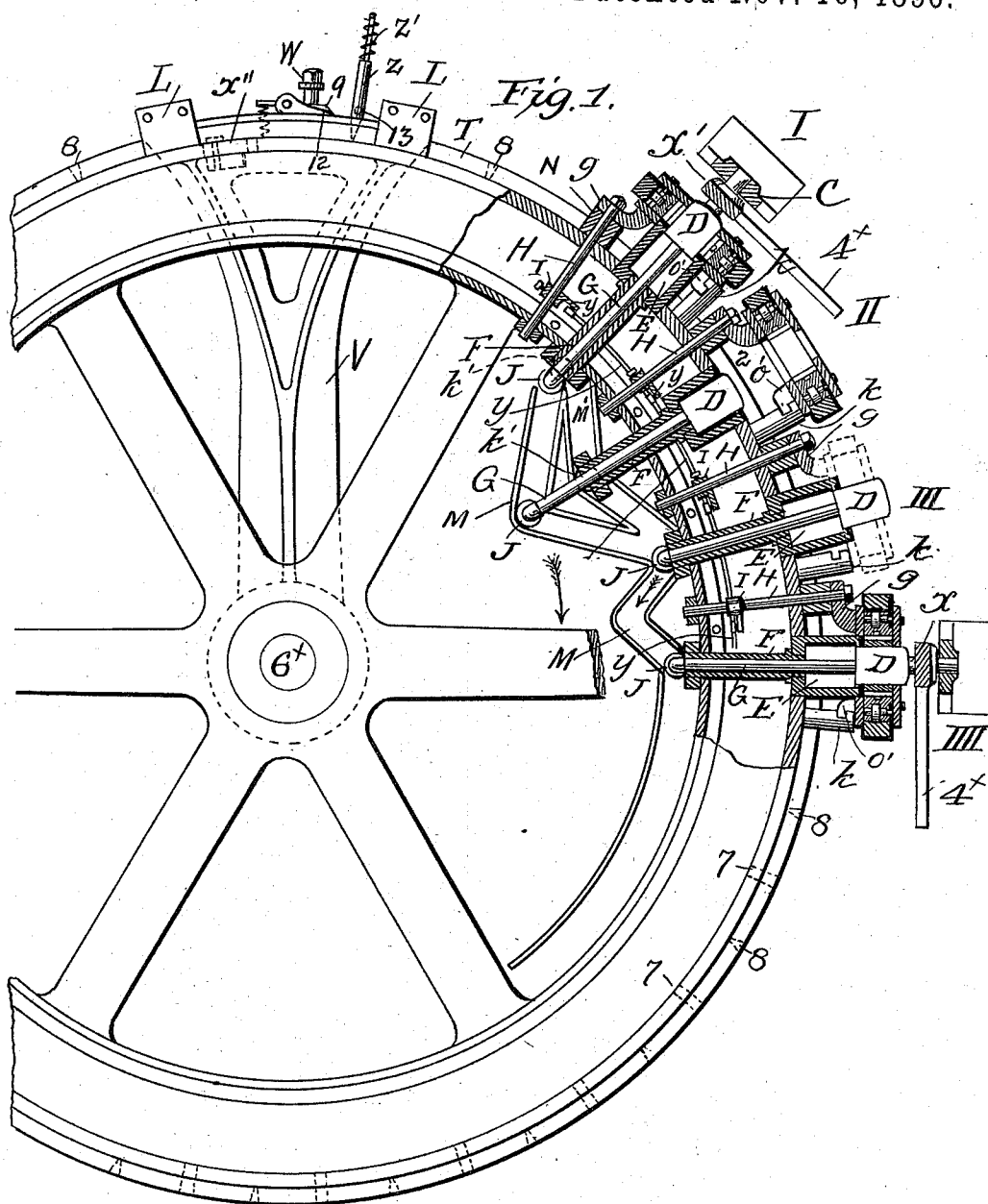
3 Sheets—Sheet 1.

A. L. SWEET.

MACHINE FOR FORMING AND PRESSING LOOPS.

No. 571,290.

Patented Nov. 10, 1896.



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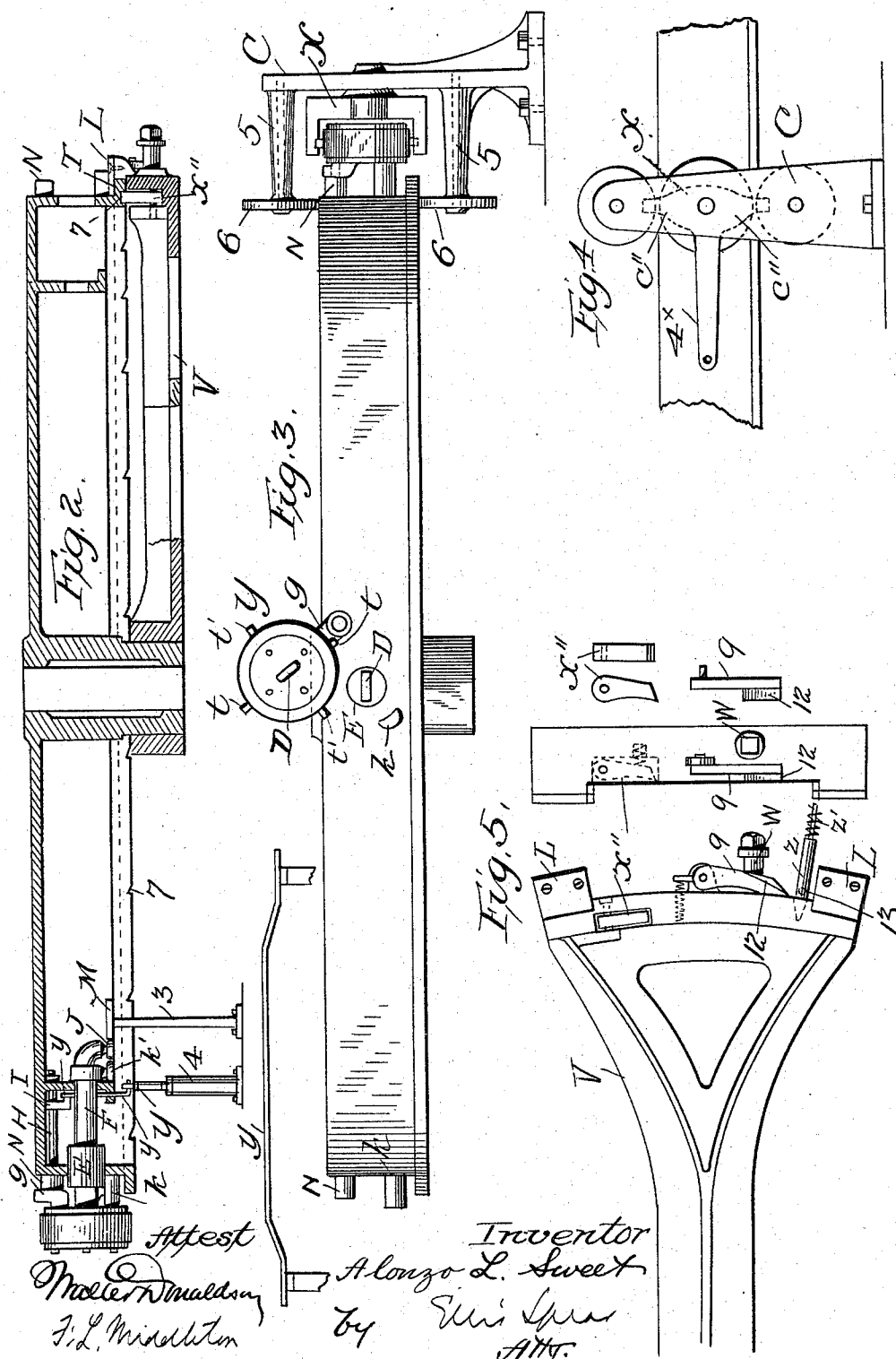
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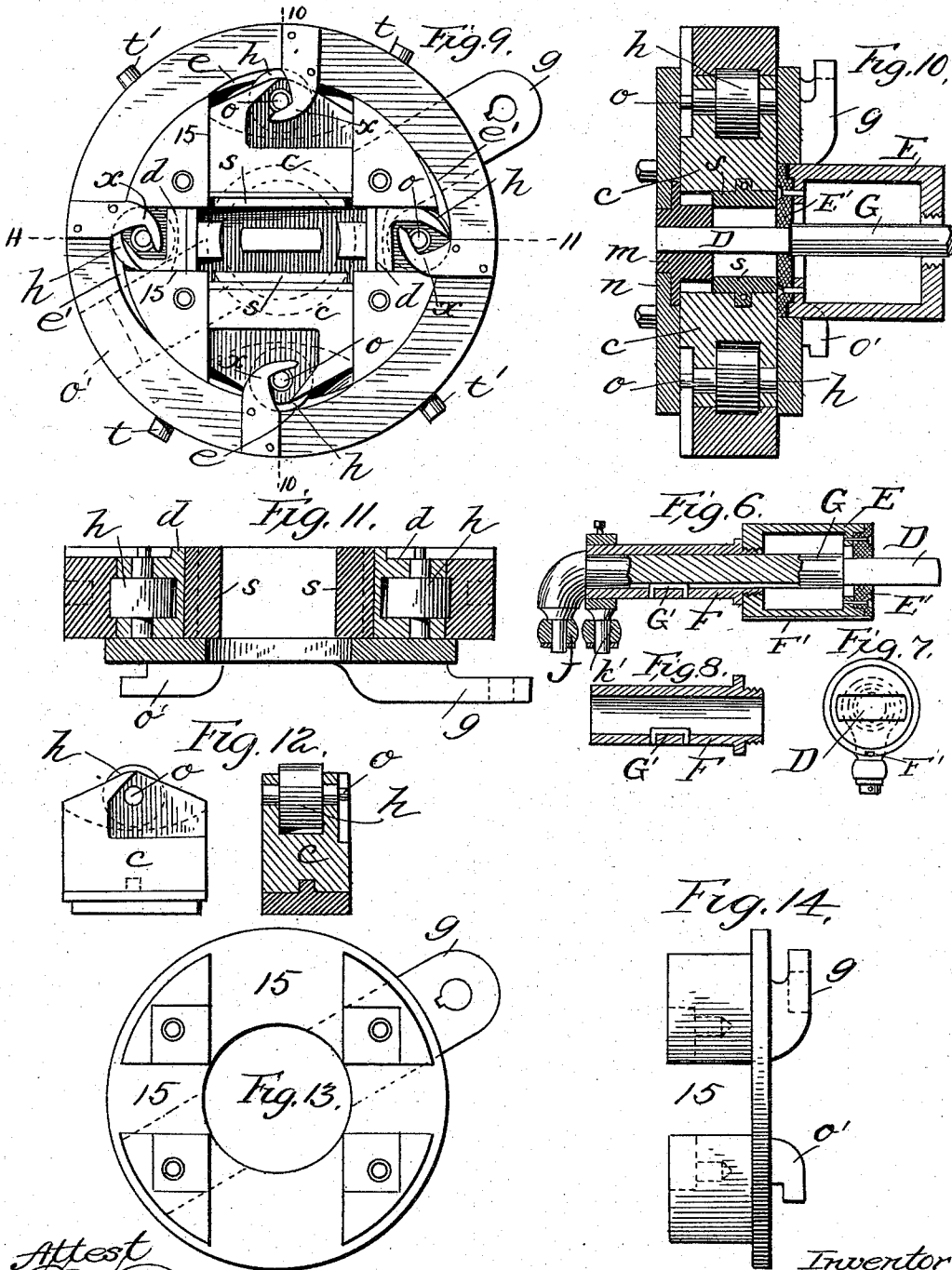


A. L. SWEET.

MACHINE FOR FORMING AND PRESSING LOOPS.

No. 571,290.

Patented Nov. 10, 1896.



Attest
J. L. Middleton

Inventor
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ATTY.

UNITED STATES PATENT OFFICE.

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MACHINE FOR FORMING AND PRESSING LOOPS.

SPECIFICATION forming part of Letters Patent No. 571,290, dated November 10, 1896.

Application filed May 2, 1895. Serial No. 547,894. (No model.)

To all whom it may concern:

Be it known that I, ALONZO L. SWEET, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Forming and Pressing Loops, of which the following is a specification, reference being had therein to the accompanying drawings.

It is the object of my invention to provide a simple and efficient machine for forming and pressing loops, such, for instance, as shown in Reissued Letters Patent of the United States, No. 11,488, dated April 16, 1895.

My invention comprises a special form of die combined with a carrier and having a clamping or pressing ring which is turned as the carrier, with the die, reaches a certain station, and thus operates the pressing parts of the die inwardly to press and form the loop about a loop-stick which has been thrust, with the loop-blank thereon, into the die. The die members are released by a backward movement of the clamping-ring, and my invention also includes the special manner of operation of the loop-stick and die in relation to each other and in various novel features herein-after pointed out.

In the accompanying drawings, Figure 1 is a plan view of the carrier with a number of the dies thereon, some of which are shown in section and part of the carrier being broken away. Fig. 2 is a vertical section of the carrier-wheel and the vibrator for moving the same. Fig. 3 is a side view of the carrier-wheel and die-operating mechanism, a number of the dies being omitted. Fig. 4 is a detail view of the same. Fig. 5 shows details of the vibrator; Fig. 6, a detail sectional view of the loop-stick and its support. Figs. 7 and 8 are details. Fig. 9 is a face view; Fig. 10, a sectional view on line 10 10 of Fig. 9; Fig. 11, a further sectional view on line 11 11 of Fig. 9; and Fig. 12, a detail view of the die. Figs. 13 and 14 show the die-frame and the ways therein for the dies.

The dies consist of top and bottom die members *c* and end die members *d*, sliding in ways 15 of the die-frame and operated by the cam-surfaces *e e'* on the clamping-ring en-

gaging the rollers *h* on the die members, so that when the ring is turned one way the die members will be forced inward to press the blank on the loop-stick to the required form, that is, in the shape of a rectangular loop. When the clamping-ring is moved in the opposite direction, the dies are retracted by the inclined fingers *x*, secured to the ring, which engage the stud *o* on the axles of the rollers of the dies. The die-blocks are cut away in order to allow the inclined fingers to work. The cam-surfaces *e e'* for the top and bottom dies are shorter than those for the side dies, and thus the top and bottom dies will act first upon the blank and then the side dies will press the same. The die-blocks have faces *s*, which act directly upon the leather. These are of brass and may be renewed.

On the front of the die-frames the plate *n* is fixed over the die-opening, and in the opening in this plate a bushing *m* is fixed, having an elongated opening to receive the loop-stick, which in cross-section is of the size and shape of the interior of the loop.

The frames are pivotally supported upon a rotary carrier by radial shafts *H*, extending through depending flanges of the wheel and connected to the arms *g* of the die-frames, and when in normal position the die-frames are supported at points radially opposite the arms *g* by the studs *o'*, which hook into the projections *k* of the carrier. The arms *g* rest upon the studs *N* on the outer flange of the wheel. When the dies are in normal position, as shown at station I, Fig. 1, with the studs *k* engaging the projections *O'*, the opening in the die will be in direct line with the loop-stick *D* (shown in detail in Fig. 6) and consisting of the rectangular head portion and the shank *G* with the laterally-bent foot portion having the roller *J* thereon. The loop-stick is arranged to slide into and out of a casing *E*, which has a head-plate *E'*, through which the loop-stick head is accurately guided. The case has a hollow shank *F* surrounding the loop-stick shank, the two shanks having a splined connection *G'* between them and the loop-stick case having a splined connection with the carrier-wheel, the splineway being shown in Figs. 6 and 7 at *F'*. These connections keep the loop-stick accurately in

its proper position relative to the die-opening. The hollow shank F has a collar at its rear end with a lateral projection and a roller k' thereon. The loop-stick case is also adapted to slide radially in the inner and outer flanges of the rotary carrier-wheel.

In Fig. 1 both the loop-stick and the loop-stick case are shown in their extreme outward position at station III, and at this station the die-frame, with the dies, has been thrown upwardly, as shown at Y in Fig. 3, leaving the loop-stick exposed and protruding from its case, it being understood that the die-frame is first moved aside and then the loop-stick and its case are advanced to the position shown at station III. The loop-blank is now placed on the loop-stick, and then both the loop-stick and its case recede toward the center of the carrier, the rollers on the shanks of the said parts running for this purpose in the stationary grooved cam M, arranged within the carrier. The die-frame is now swung back into normal position in line with the loop-stick, and the loop-stick, with the loop-blank thereon, advancing places the same within the die-frame and in position to be pressed by the dies. The loop-stick case also advances with the loop-stick, and its head-plate E' closes the inner or rear opening of the die-cavity, Figs. 1 and 3. The front opening is closed by the bushing m , heretofore mentioned, and the loop-stick enters and is guided and held by the opening therein. The die-opening is now entirely inclosed, with the loop-blank on the loop-stick and directly in front of the dies. The swinging of the die-frame to and from position in line with the loop-stick is effected by the cam-track Y, a roller on the rod y , Figs. 1 and 2, and an arm I on the die-shaft H, the dies being raised by the cam and falling by gravity. The rod y works through a flange of the carrier-wheel. The loop-blank having been placed in the die-frame, as described, the continued movement of the carrier has brought the die-frame between the arms of a presser-yoke X, pivoted to the standard C. This yoke has its arm c'' in the path of the pins t , projecting from the clamping-ring, and when the die arrives opposite the presser-station IIII and comes to rest the presser is turned on its pivot, so that the arms thereof will engage with the pins and turn the clamping-ring and thus operate the dies, as heretofore set forth. The swinging of the die-frame to normal position takes place just before the die reaches station IIII, and the introduction of the loop-stick, with the loop-blank thereon, takes place just as the carrier comes to rest at station IIII. The presser-yoke is then turned back and removes its arms from the path of the pins, and the die will be carried from the presser-station at the next movement forward of the machine, which takes place step by step, as herein-after described. The ring and dies remain in clamped position until the carrier makes

nearly a complete revolution and arrives at the station I, the loop being under pressure during all of this time, the loop-stick remaining in its outward position, and the rollers on the shanks of the loop-stick and the loop-stick case being free from the cam M. When the die arrives at the station I and comes to rest, a second yoke, X', which is located at this station and which is similar in all respects to the yoke X, is operated in a direction opposite to that of the presser-yoke with the effect of engaging the pins t' on the clamping-ring, unlocking the ring, and retracting the dies through the inclined fingers. This action takes place while the carrier is at rest, and simultaneously the loop-blank is being placed at station III and the clamping of the new blank at the station IIII. When the die reaches the station I, as before described, and the dies are retracted, the rollers J k' reach the cam-tracks M M', respectively. The next movement of the carrier will cause the retraction of the loop-stick and the loop-stick case, and from Fig. 1 it will be seen that the loop-stick will retract more rapidly and to a greater extent than the loop-stick case, as the cam-track M is steeper than the cam-track M'. The loop-stick case retracting flush with the edge of the carrier and the loop-stick moving back within the case will effect the discharge of the completed loop from the loop-stick and the loop will fall through the space 2, Fig. 1, from the machine. The next step of the carrier will cause the stationary cam Y to swing the die-frame aside, through the rotation of the shaft H, and also the advance of the loop-stick and case will take place, by means of the cams M M', to the position shown at station III, where the stick is again exposed for receiving a new loop-blank. The loop-stick case at this point performs another important office in determining how far the new loop-blank is to be thrust onto the loop-stick. From this station to the next the loop-stick and case are retracted and advanced together, their relative position remaining unchanged.

The cam-tracks M M' are supported by posts 3, as shown in Fig. 2, and the cam-track Y is also supported upon a post 4. The clamping and unlocking yokes are operated through any suitable means connected to the arm 4^x of the yoke. The standards C, to which the yokes are pivoted, have laterally-extending arms 5 with antifriction wheels or rollers 6, supported thereby, which bear on the upper and lower edges of the carrier and steadies and guides the same. The carrier is mounted on the shaft 6^x and is in the form of a wheel. The outer flange of the carrier has teeth 7 in its lower edge to be engaged by the pawl x'' , pivoted to the vibrator V, which is pivoted axially of the carrier, extends radially thereof, and is guided and supported at the outer edge of the carrier by clips L, secured to the vibrator and overlapping the rim T on the

outer flange. The vibrator may be moved back and forth by any suitable means connecting with pin W, and in this movement it moves the carrier step by step. The carrier
 5 is held in moved position by the stop-pin z, supported independently of the carrier and pressed by the spring z' to engage the holes 8 in the side of the carrier. As the vibrator moves forward a spring-releasing pawl 9, piv-
 10 oted on the vibrator and having a lateral rib 12, strikes the lug 13 on the side of the stop-pin z and moves it back to release the carrier, the push-pawl then engages the teeth 7 and moves the carrier, and the stop-pin being
 15 now free from the releasing-pawl engages the next hole and retains the carrier in moved position. As the vibrator moves back the lateral rib on the releasing-pawl will simply ride over the stud on the stop-pin and then
 20 drop into normal position with the front end of the rib in line with the lug of the stop-pin ready to release the stop-pin, when the vibrator again moves forward.

The head-plate E', as before stated, closes
 25 the rear of the die-opening, and from Fig. 10 it will be seen that the loop-stick case, with this head, is of sufficient diameter to suit the largest size of loop it is desired to make, and when the loop has been pressed and the stick
 30 retracted this case will discharge the completed loop. The vibrator in practice works under the cams M M', but it is shown slightly out of position in Fig. 1 for convenience of illustration, as is also the cam Y.

35 There may be any number of dies used about the periphery of the carrier-wheel, as may be desired.

The bushing m is held by the plate n, and by removing this the bushing may be re-
 40 placed by another of different length to suit different lengths of loops.

I claim—

1. In combination, a die comprising die members and clamping means, a movable
 45 carrier for the die and its clamping means to move the same from station to station and means for operating the clamping means automatically as the die with its clamp reaches the proper station, substantially as described.

50 2. The die comprising the frame, the die members, the clamping-ring having the cam-surfaces and the inclined fingers for returning the dies to normal position.

3. The die comprising the die members, the
 55 rollers having extended axles, the clamping-ring having cam-surfaces acting on the roller and the inclined fingers to engage the roller-axles, substantially as described.

4. In combination the die comprising the
 60 die members with means for moving them toward and from each other said members co-operating to form a die-cavity between them and the loop-stick with means for moving the same into and out of the die-cavity, said dies
 65 when in their inward position pressing the blank simultaneously about the sides of the

loop-stick located between them, substantially as described.

5. In combination, a movable carrier, a die mounted thereon to move therewith and com-
 70 prising a series of die members movable toward and from each other and coöperating to form a die-cavity between them, means also movable with the carrier to clamp said
 75 dies and a loop-stick also mounted on the carrier to move therewith and means for reciprocating the loop-stick into and out of the die-cavity, substantially as described.

6. In combination, the die comprising the frame, and the die members forming a die-
 80 cavity between them, the reciprocating loop-stick with operating means for moving the loop-stick into and out of said cavity and means for moving the die into and out of line with the loop-stick, substantially as de-
 85 scribed.

7. In combination, the movable carrier, the die and loop-stick carried thereby, means for moving the die into and out of line with the
 90 loop-stick and means for advancing and retracting the loop-stick, substantially as described.

8. In combination the movable carrier, the swinging die thereon having a die-cavity, the
 95 reciprocating loop-stick with means for moving the same into and out of the die-cavity and means for operating said parts, substantially as described.

9. In combination, the reciprocating loop-
 100 stick, the die movable into and out of line with the same, the support for the die and loop-stick and means for advancing and retracting the loop-stick to and from the die and also for advancing and retracting the
 105 loop-stick when the die is moved aside, substantially as described.

10. In combination, the die comprising the die members, the reciprocating loop-stick ar-
 110 ranged to enter the cavity and means reciprocating with the loop-stick for closing said cavity, substantially as described.

11. In combination, the die comprising the die members forming a die-cavity between
 115 them, the loop-stick movable into and out of the die-cavity, with operating means therefor and means adjacent to the loop-stick arranged to receive the same when retracting and to discharge the loop therefrom, substan-
 120 tially as described.

12. In combination, the die comprising the
 120 die members forming a die-cavity between them, the reciprocating loop-stick movable into and out of the die-cavity and means reciprocating therewith arranged to receive the
 125 loop-stick when retracting to discharge the loop therefrom, substantially as described.

13. In combination, the die comprising the frame, with the die members, the reciprocating loop-stick movable into and out of the die,
 130 means reciprocating with the loop-stick to close the opening, said means being movable independently of the loop-stick and act-

ing to discharge the loop from the loop-stick, substantially as described.

14. In combination, the die comprising the frame, with the die members, the reciprocating loop-stick movable into and out of the die, and the loop-stick case reciprocating with the loop-stick and arranged to close the opening and means for operating the said case and loop-stick whereby the said stick will retract within the case to discharge the loop, substantially as described.

15. In combination in a die-frame, the radially-movable die members, the loop-stick, the front plate *n* and the removable bushing *m*, substantially as described.

16. In combination, in a die, the frame, the radially-movable die members, the loop-stick with means for reciprocating the same, means for moving the die aside, and the bushing *m* on the die arranged to receive the loop-stick when advanced, substantially as described.

17. In combination, the movable carrier, the loop-sticks and cases movable on the same, the dies movable into and out of line with the loop-sticks and cases and means for retracting the loop-stick and case from the die and for retracting the loop-stick within the case; for advancing the loop-stick and case and protruding the stick to receive a new blank, and for retracting and advancing the said stick and case in the same relative position to the die, and means for operating the die to and from position, substantially as described.

18. In combination, the die comprising the die members, the reciprocating loop-stick, the reciprocating case, the supports for said parts, means for moving the die into and out of line with the loop-stick, means for advancing the loop-stick case and protruding the loop-stick therefrom to receive the new loop and for retracting and advancing the loop-stick and case in the same relative position to place the loop in the die, substantially as described.

19. In combination, the carrier, the dies, the reciprocating loop-stick having shanks, the loop-stick cases with hollow shanks, the rollers on the shanks, the cams *M*, *M'* for operating the said parts and means for moving the dies into and out of line with the loop-stick, substantially as described.

20. In combination, the carrier, the dies, the reciprocating loop-stick and case, the cam-tracks *M*, *M'* for operating said parts, the said tracks meeting at one point and a single track to operate both the loop-stick and case simultaneously, substantially as described.

21. In combination, the carrier, the dies pivoted thereto, the shafts *II* connected to the

dies, the cam *Y* for operating the shafts and dies and the reciprocating loop-sticks on the carrier with means for operating the same.

22. In combination, the carrier, the dies comprising the die members and the clamping-ring and means for operating the said ring comprising the upper and lower arms to engage parts of the ring, said arms being pivotally supported.

23. In combination, the carrier, the dies with the rotary clamping-rings and the pivoted yoke arranged at one station to engage and turn the ring when the die arrives at the said station.

24. In combination, the carrier, the dies with clamping-rings, the pivoted yoke arranged at one station for operating the ring and the guide-rollers for steadying the carrier, substantially as described.

25. In combination the moving carrier, the dies with the clamping-rings supported on the carrier to move therewith and means for turning the rings arranged adjacent to the path of the die for operating the ring when the die arrives at that station, substantially as described.

26. In combination, the carrier, the reciprocating loop-sticks, the dies pivoted to the carriers and arranged to be swung upwardly and the catch-studs adapted to support the dies in proper position, substantially as described.

27. In combination, the carriers comprising the inner and outer flanges, the loop-sticks reciprocating therein, the pivoted die-frames and the shafts *II* therefor journaled in said flanges, substantially as described.

28. In combination, the carrier, the dies and loop-sticks, the vibrator, the push-pawl carried thereby, the stop-pin and the releasing-pawl also carried by the vibrator, substantially as described.

29. In combination, the carrier, the dies with the clamping-rings and the locking and unlocking means arranged adjacent to the path of the carrier to operate the said rings, substantially as described.

30. In combination, a loop-stick, a die, means for moving one of said parts into and out of line with the other and means for moving one of said parts in a direction axially of the loop-stick and die-cavity whereby the loop-stick will enter the die-cavity, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ALONZO L. SWEET.

Witnesses:

IRVING S. BERNHEIMER,
HARRY D. KOHN.