

No. 685,962.

Patented Nov. 5, 1901.

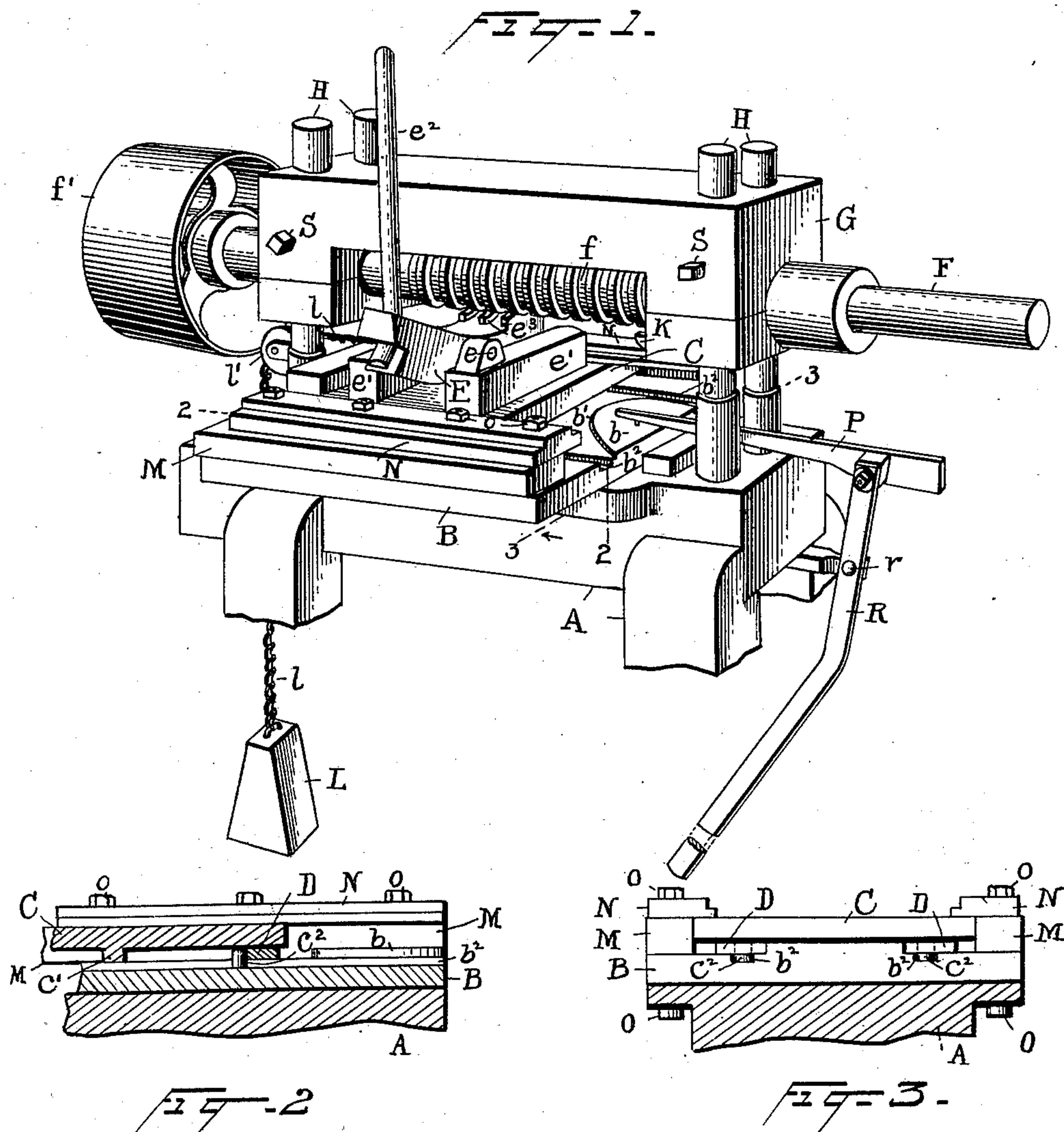
E. D. WOODS.

APPARATUS FOR MAKING SICKLES OR SIMILAR ARTICLES.

(Application filed May 26, 1898.)

(No Model.)

3 Sheets—Sheet 1.



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ATTYS

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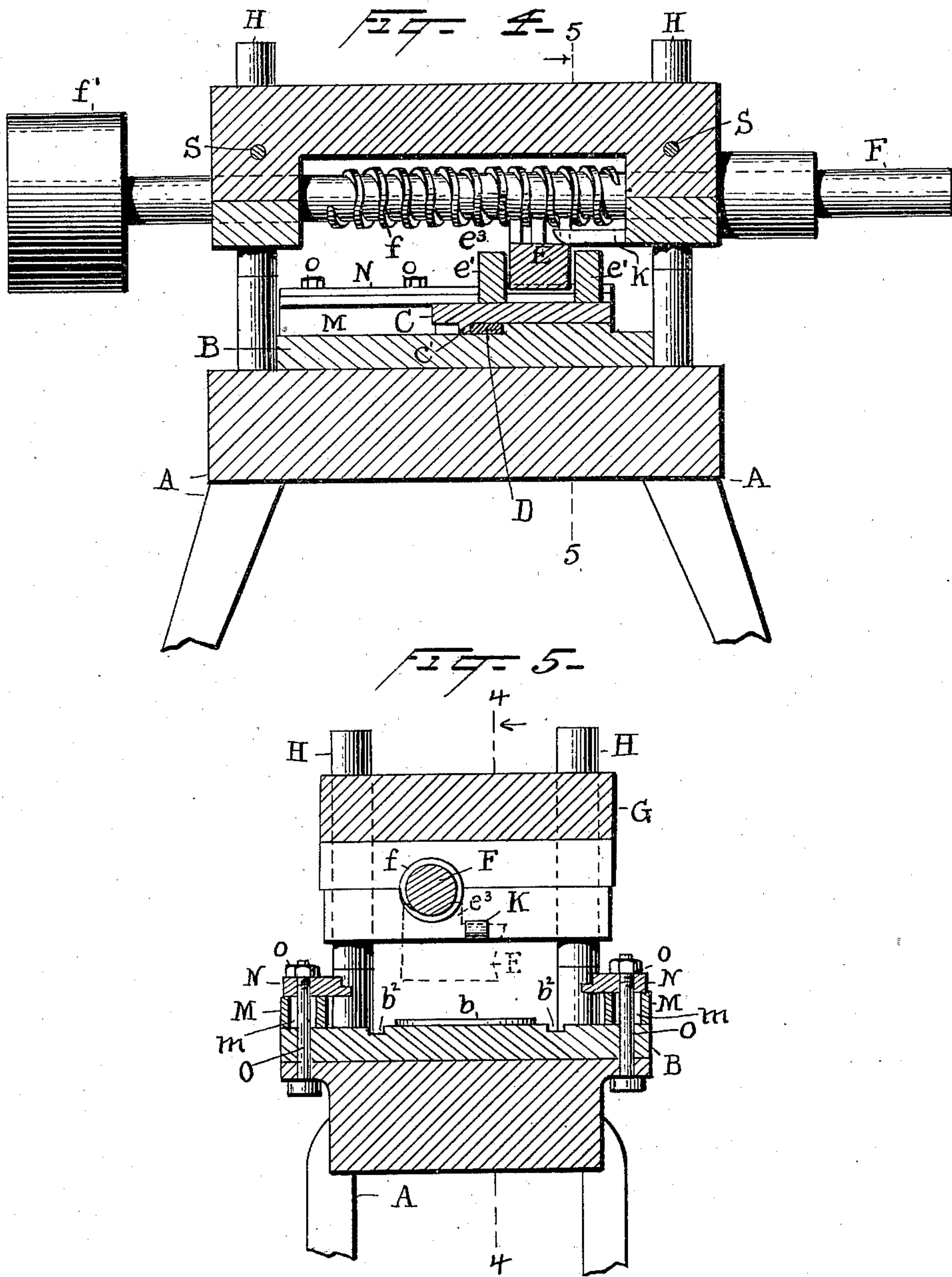
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3 Sheets—Sheet 2.



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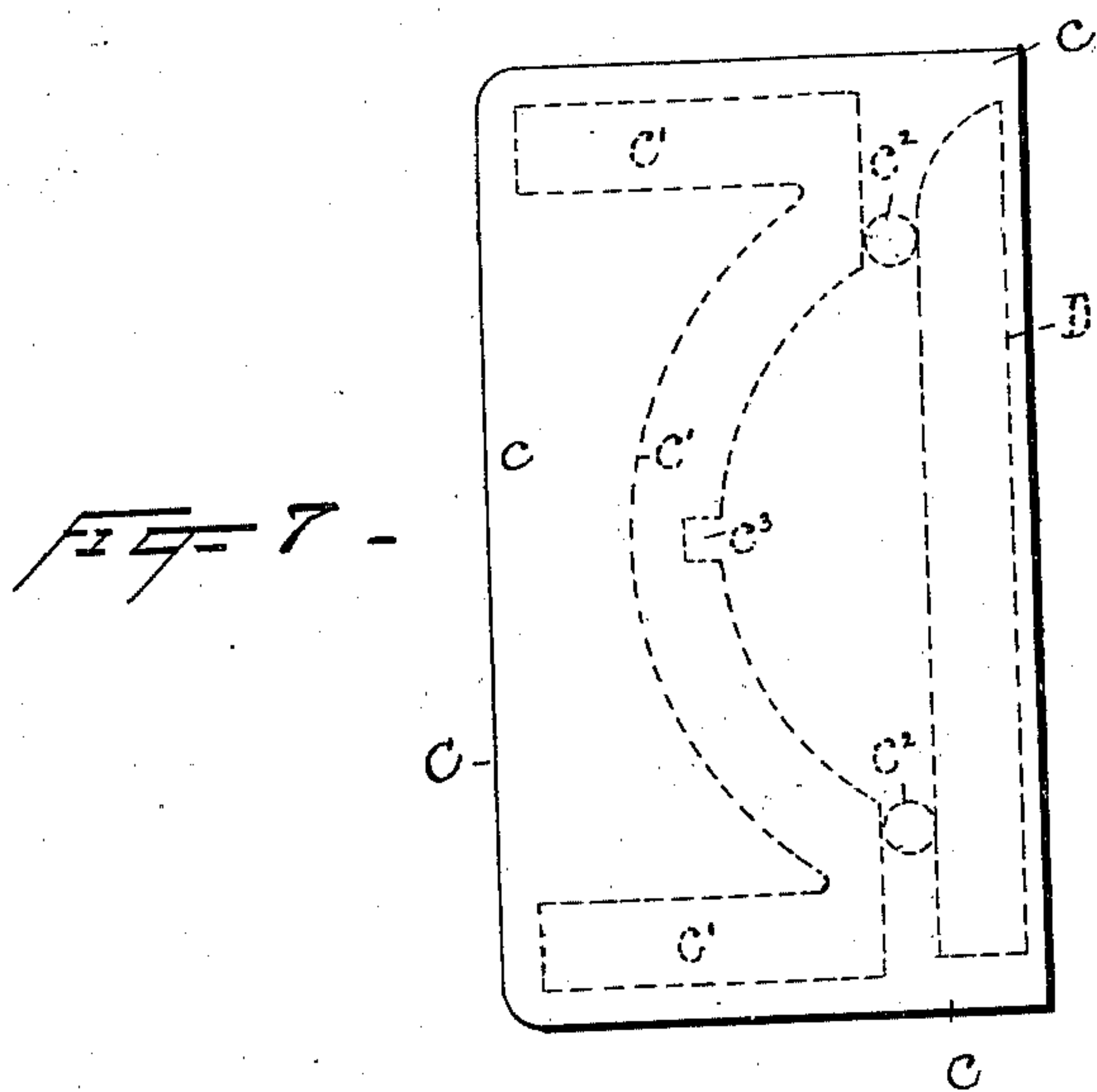
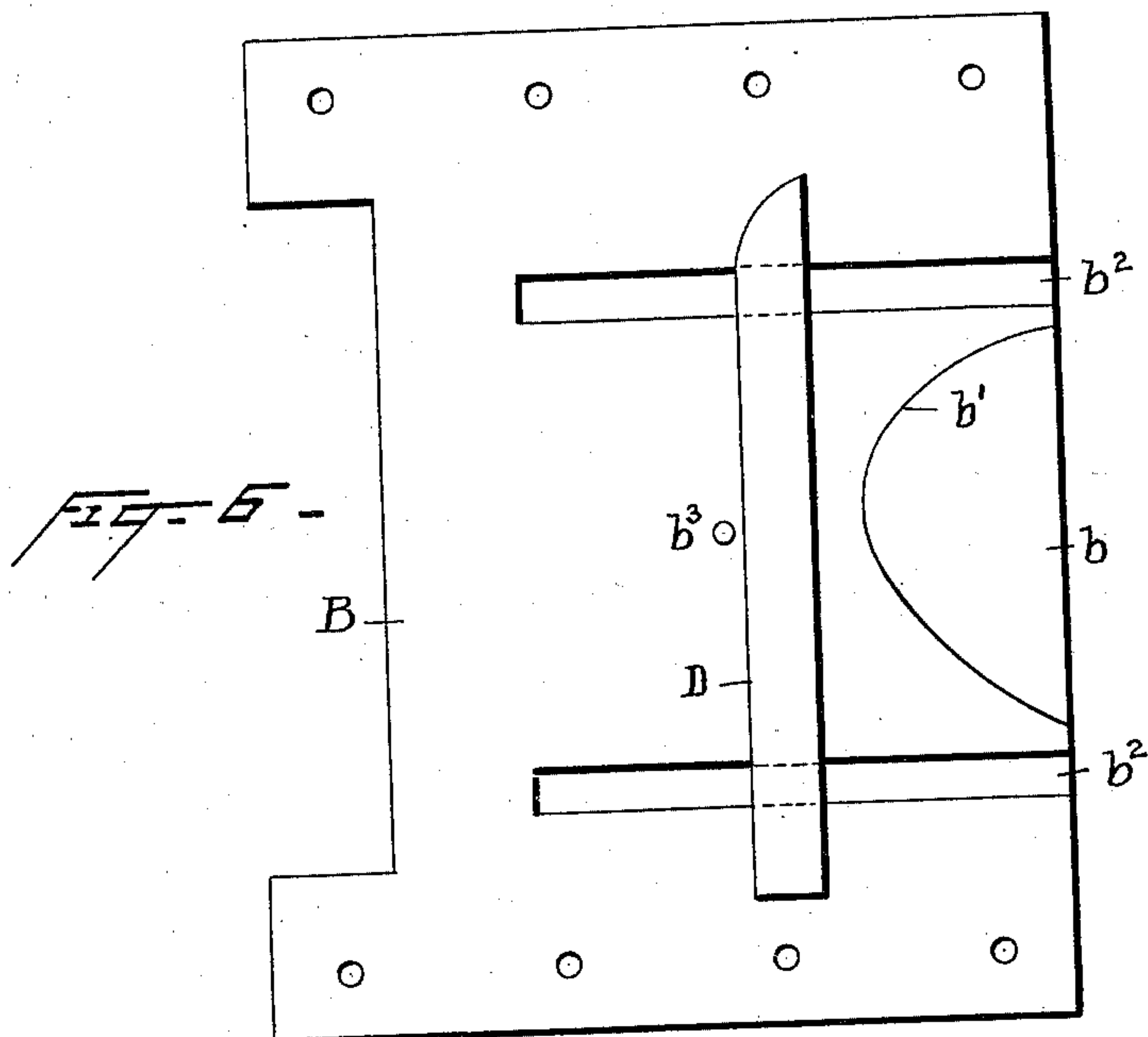
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APPARATUS FOR MAKING SICKLES OR SIMILAR ARTICLES.

(Application filed May 26, 1898.)

3 Sheets—Sheet 3.

(No Model.)



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR MAKING SICKLES OR SIMILAR ARTICLES.

SPECIFICATION forming part of Letters Patent No. 685,962, dated November 5, 1901.

Application filed May 26, 1898. Serial No. 681,777. (No model.)

To all whom it may concern:

Be it known that I, EDWARD D. WOODS, a citizen of the United States, and a resident of Granville, Washington county, State of New York, have invented a new and useful Improvement in Apparatus for Making Sickles or Similar Articles, of which the following is a specification.

My invention relates to apparatus for making sickles and similar articles, and particularly for bending such articles from a blank of metal. Its object is to simplify, cheapen, and make more easy the manufacture of sickles or similar articles and to improve the quality and character of the finished product.

It consists of the apparatus herein shown and described.

Heretofore it has been customary in making sickles and similar articles to draw and forge them out of a block of steel or iron or to stamp them out of a sheet of such metal. Such a process is not only long, expensive, and troublesome, but is also wasteful of material. It has heretofore, so far as I am aware, been impossible to bend a straight thin blank of steel or iron into the curved form of a sickle without producing wrinkles, flaws, or imperfections in the curved blade, which unfit it for use. I have discovered that a straight blank of steel or iron can be bent into curved sickles without any such wrinkles, flaws, or imperfections by bending the blank while heated around a die having the curved shape of the sickle to be made and compressing the sides of the blank during the bending operation.

By my improved apparatus sickles can be made much more quickly, readily, and cheaply than by any of the known apparatus, and the resulting product is strong and durable and capable of taking and keeping a good cutting edge, and is in every way an effective and superior article.

In the drawings accompanying this specification and forming part hereof, and in which similar reference characters in the different figures represent corresponding parts, I have illustrated and will now describe the preferred form of my improved apparatus.

Figure 1 is a perspective view of my improved machine. Fig. 2 is a vertical longi-

tudinal section through the lower and upper plates, with certain parts omitted, taken on the lines 2 2 of Fig. 1, viewed as shown by the arrow. Fig. 3 is a vertical cross-section through the same parts, taken on the line 3 3 of Fig. 1, viewed as shown by the arrow. Fig. 4 is a vertical longitudinal section of my improved machine, taken on the lines 4 4 of Fig. 5, viewed as shown by the arrow. Fig. 5 is a vertical cross-section through the same, taken on the lines 5 5 of Fig. 4, viewed as shown by the arrow, omitting the top plate, but showing the clutch e^3 and a part of the lever E in dotted lines. Fig. 6 is a top view of the lower plate, showing a blank in position preparatory to bending. Fig. 7 is a top view of the upper plate with the clutch arrangement omitted.

A is the framework of my improved machine.

B is the lower plate, having on its upper surface a die b , having a curved vertical face b' of the shape of the sickle to be formed. This lower plate has also slots b^2 and a stop-pin b^3 for purposes presently to be described. C is the upper plate. Its upper part c is raised above the upper surface of the lower plate B by means of downwardly-projecting ribs c' and downwardly-projecting pins c^2 , which rest upon the lower plate, the ribs c' resting upon the upper surface of the lower plate and the pins c^2 resting in the slots b^2 of the lower plate. The upper plate is adapted to move forward and backward upon the lower plate, the pins c^2 moving in the slots b^2 . The cross-ribs c' have a notch c^3 cut into them, into which the stop-pin b^3 of the lower plate enters when the upper plate is at the limit of its forward movement.

D represents the blank, of steel, which is preferably a straight blank, out of which the sickle is to be formed. In the operation of the machine this blank is laid upon the lower plate in the position shown in Fig. 6, directly in front of the die b , the lower plate supporting the blank during the entire operation, the blank being heated to the proper degree of heat, which is approximately a red heat. The degree of heat may be varied somewhat; but I find that a red heat gives good results. The upper plate then moves forward by means

presently to be described, the pins c^2 moving in the slots b^2 and bearing against and forcing the blank forward into contact with the die and bending it around the curved surface b' of that die until it assumes the curved shape of a sickle. As the upper plate C begins its forward movement its upper part c rides over the blank D until it is in the position shown in Fig. 7. Just enough room is left between the lower plate and the under surface of c of the upper plate to permit this to be done and to bring the under surface of c into close contact with the upper surface of the blank D when the parts are in the position shown in Fig. 7. As the upper plate advances farther and as the blank is forced against and bent around the die the upper part c of the upper plate lies over the blank, and it and the lower plate B compress the blank between them as it is being bent and effectually prevent the formation of any wrinkles, flaws, or imperfections in the thin blank as it is bending.

Movement is imparted to the upper plate by the following-described mechanism.

Above the upper surface of the upper plate is a lever E, fulcrumed at e in supports e' , carried by the upper plate. The lever E has a handle e^2 at one end and a screw-threaded clutch e^3 at the other.

F is a shaft screw-threaded at f , having the pulley f' at one end. This shaft is mounted in bearings in the support G. The support G is mounted on four posts H, secured to the framework A of the machine. The shaft F is driven through pulley f' from any suitable source of power. The screw-threads of clutch e^3 are so arranged as to take into the screw-threads f when the handle e^2 is pulled downward. When it is desired to move the upper plate forward to bend a blank, handle e^2 is pulled downward, throwing the clutch e^3 into contact with the screw-threaded portion f of the rapidly-revolving shaft F. The motion of the shaft carries the clutch and the upper plate forward, the friction engendered being sufficient to hold the clutch in contact with the screw-threaded portion f . In order to disengage the clutch from the screw-threaded shaft, I have arranged a cut-off K at the forward end of the machine, having a curved surface which strikes against a part of the clutch when it has reached its forward limit and forces it downward out of contact with the screw-threaded shaft. The weight L, secured by chain l to the back part of upper plate C, pulls the upper plate backward into its original position. The chain l runs over the pulley l' .

Guides are provided at each side of the machine to guide the upper plate in its forward and backward movement. These guides consist of two kinds—the lower guides M and the upper guides N. The lower guides M act as lateral guides to the plate C, the sides of the plate abutting against the sides of the guides. The upper guides N project over the upper plate C, as shown, and act as vertical guides

to hold the upper plate down upon the blank. The two parts M and N of the guides are secured to the framework by bolts O and nuts o , as shown in Fig. 5. By means of these nuts and bolts the guides are held to the framework of the machine. By means of them the vertical guides N can be adjusted vertically at any height, so as to permit different thicknesses of blanks to be used in the machine. The openings in the lateral guides M, through which the bolts O pass, are made in the form of elliptical slots, the longer axes of which lie in a direction transverse to the length of the machine, or, in other words, lie in the same direction as the lines 3 3 of Fig. 1. These slots are lettered m in the drawings, as shown in Fig. 5. By reason of the construction above described the guides M are capable of a slight lateral play or adjustment. This is for the purpose of permitting the guide to give way on one side in case the blank D should not be placed exactly in the proper position, but should be placed or be forced for any reason toward one side. Without such lateral flexibility in the guides the machine might bind.

P is an arm pivoted upon lever R, the latter being fulcrumed at r to the framework of the machine. The end of arm P normally projects slightly over the upper part of lower plate B. The object of arm P and lever R is to enable the workman by pressing his foot on the lower part of lever R to force back upper plate C—as, for example, in case that it should for any reason bind in the machine—so that weight L cannot draw it into its original position at the back of the machine.

In order to adapt the machine for use upon blanks of varying thickness, I preferably arrange the support G so as to be vertically adjustable upon the posts H. The support can thus be moved up or down these posts and can be secured at any determinate height thereon by means of the screws S, which bear upon the posts H. By these means I prevent binding of the parts, while still keeping the shaft F within suitable working distance of clutch e^3 .

The pins c^2 and slots b^2 act as guides for the upper plate in its forward and backward movements. The object of having stop-pin b^3 on the lower plate is to prevent the blank from being drawn backward by the upper plate beyond that point in case the blank should adhere to the upper plate in its backward movement.

The operation of my improved machine is as follows: The parts are normally in the position shown in Fig. 1. A blank heated to any suitable degree of heat, preferably a red heat, is placed upon the lower plate B immediately in front of the die b , as shown in Fig. 6. The operator then pulls the handle e^2 downward, throwing clutch e^3 into contact with the revolving screw-threaded shaft F. This shaft in its revolution through clutch e^3 and its connections with the upper plate

pulls that plate forward, pins c^2 bearing against and forcing the blank against the die and bending it around that die into the desired shape. In the first part of the forward movement of the upper plate the forward part of the upper part C of that plate rides over the blank and lies snugly over and upon it during the entire bending operation, the blank being thus snugly held or compressed by the under and upper plates during the bending operation. When this operation has been completed, cut-off K strikes a portion of clutch e^3 , forcing it out of contact with the screw-threaded shaft F, whereupon weight L pulls the upper plate backward to its original position. In case the upper plate should for any reason bind, so that the weight cannot pull it backward, the operator can force it backward by pressing his foot against lever R. The blank is then withdrawn from the machine and the latter is ready for another operation. When in the operation of my machine the handle e^2 of lever E is pulled downward, that pulling and the contact of clutch e^3 with shaft F tend to hold upper plate C firmly down upon the blank, thus aiding the compression of the blank during the bending operation. This downward pressure is of course not exerted as the upper plate moves backward. During the operation of bending the blank the latter is positively compressed between the upper and lower plates. This is accomplished partly by the weight of the upper plate itself as it is moved forward and rises upon and rides over the blank and partly by the downward pressure exerted upon the upper plate through the engagement of lever E with screw f of shaft F. This pressure can be varied by adjusting guides N and support G.

By my improved apparatus sickles and similar articles can be much more cheaply, readily, and rapidly made and with less labor than by the apparatus now in use and the resulting article is of a superior character. The finished sickle or other article can be readily removed from the machine without any prying or forcing.

Many modifications may be made in the apparatus herein shown and described without departing from my invention. Thus the degree of heat may be varied to suit the circumstances of each case, any suitable means for bringing the blank and die into contact with each other may be used, and where a movable upper plate is used for that purpose the means for giving it forward and backward movement and for guiding it may be varied. The location and character of the die may be altered, and the means for compressing the blank during the bending operation may also be varied. Other modifications may also be made, if desired.

My improved apparatus is especially adapted for the manufacture of sickles; but it is evident that it may be applied to the manu-

facture of any article which has a thin curved portion of iron or steel.

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

1. In a machine for making sickles or similar articles from a blank, a lower plate for supporting the blank, a curved die upon the lower plate and of the shape of the sickle or other article to be made, an upper plate adapted to move to force the blank against the die and having a part adapted to lie over and to compress the blank while the latter is being bent, and means for moving the upper plate whereby the blank, when heated, will be compressed upon its sides and will be bent into the desired form.

2. In a machine for making sickles or similar articles from a blank, a lower plate for supporting the blank, having slots in its surface, a curved die upon the lower plate and of the shape of the sickle or other article to be made, an upper plate adapted to move and having a part adapted to lie over and to compress the blank while the latter is being bent, pins projecting downward from the upper plate into the said slots and adapted to bear against the blank and to force it against the die when the upper plate moves forward, and means for moving the upper plate, whereby the blank, when heated, will be bent into the desired form.

3. In a machine for making sickles or similar articles from a blank, a lower plate for supporting the blank, a curved die upon the lower plate and of the shape of the sickle or other article to be made, an upper plate adapted to move to force the blank against the die and having a part adapted to lie over and to compress the blank while the latter is being bent, and means for moving the upper plate, whereby the blank, when heated, will be bent into the desired form, and a stop-pin in the lower plate to prevent the blank from being drawn back by the upper plate when it moves backward.

4. In a machine for making sickles or similar articles from a blank, a lower plate for supporting the blank, a curved die upon the lower plate and of the shape of the sickle or other article to be made, an upper plate adapted to move to force the blank against the die and having a part adapted to lie over and to compress the blank while the latter is being bent, means for moving the upper plate to cause it to force the blank against the die and means for returning the upper plate to its original position, whereby the blank, when heated, will be bent into the desired form.

5. In a machine for making sickles or similar articles from a blank, a lower plate for supporting the blank, a curved die, of the shape of the sickle or other article to be made, an upper plate adapted to move to force the blank and the die together and having a part adapted to lie over and to compress the blank while the latter is being bent, a screw-threaded shaft

and means for driving it, a screw-threaded clutch mounted upon the upper plate and adapted to be thrown into contact with the screw-threaded shaft to cause the upper plate to move forward and to compress the blank, and means for throwing the clutch into contact with the screw-threaded shaft, whereby the blank, when heated, will be bent into the desired form.

6. In a machine for making sickles or similar articles from a blank, a lower plate for supporting the blank, a curved die, of the shape of the sickle or other article to be made, an upper plate adapted to move to force the blank and the die together and having a part adapted to lie over and to compress the blank while the latter is being bent, a screw-threaded shaft and means for driving it, a screw-threaded clutch mounted upon the upper plate and adapted to be thrown into contact with the screw-threaded shaft to cause the upper plate to move forward and to compress the blank, and means for throwing the clutch into and out of contact with the screw-threaded shaft, whereby the blank, when heated, will be bent into the desired form.

7. In a machine for making sickles or similar articles from a straight blank, a lower plate for supporting the blank, a curved male die upon the lower plate and of the shape of the sickle or other article to be made, an upper plate adapted to move to force the blank against the die and having a part adapted to lie over and to compress the blank while the latter is being bent, a screw-threaded shaft and means for driving it, a screw-threaded clutch mounted upon a lever upon the upper plate and adapted to be thrown into contact with the screw-threaded shaft to cause the upper plate to move forward and to compress the blank, a handle upon the lever to throw the clutch into contact with the screw-threaded shaft, a cut-off adapted to strike the clutch, when the upper plate has reached the limit of its forward movement, to force the clutch out of contact with the screw-threaded shaft, whereby the blank, when heated, will be bent into the desired form.

8. In a machine for making sickles or similar articles from a straight blank, a lower plate for supporting the blank, a curved male die upon the lower plate and of the shape of the sickle or other article to be made, an upper plate adapted to move to force the blank against the die and having a part adapted to lie over and to compress the blank while the latter is being bent, a screw-threaded shaft and means for driving it, a screw-threaded clutch mounted upon a lever upon the upper plate and adapted to be thrown into contact with the screw-threaded shaft to cause the upper plate to move forward and to compress the blank, a handle upon the lever to throw the clutch into contact with the screw-threaded shaft, a cut-off adapted to strike the clutch, when the upper plate has reached the limit of its forward movement, to force the clutch out

of contact with the screw-threaded shaft, whereby the blank, when heated, will be bent into the desired form, and a weight for returning the upper plate to its original position.

9. In a machine for making sickles or similar articles from a blank, a lower plate for supporting the blank, a curved die of the shape of the sickle or other article to be made, an upper plate adapted to move to force the blank and the die together and having a part adapted to lie over and to compress the blank while the latter is being bent, a screw-threaded shaft, a support therefor mounted upon posts and adjustable vertically thereon, means for securing said support at any determinate height on said posts to admit of the use in the machine of blanks of different thicknesses, means for driving said shaft, a screw-threaded clutch mounted upon the upper plate and adapted to be thrown into contact with the screw-threaded shaft to cause the upper plate to move forward and to compress the blank, and means for throwing the clutch into contact with the screw-threaded shaft, whereby the blank, when heated, will be bent into the desired form.

10. In a machine for making sickles or similar articles from a blank, a lower plate for supporting the blank, a curved die of the shape of the sickle or other article to be made, an upper plate adapted to move to force the blank and the die together and having a part adapted to lie over and to compress the blank while the latter is being bent, means for moving the upper plate, and lateral guides for controlling the upper plate in its movement having a slight lateral play to prevent binding, whereby the blank, when heated, will be bent into the desired form.

11. In a machine for making sickles or similar articles from a blank, a lower plate for supporting the blank, a curved die of the shape of the sickle or other article to be made, an upper plate adapted to move to force the blank and the die together and having a part adapted to lie over and to compress the blank while the latter is being bent, means for moving the upper plate, vertical guides for holding the upper plate down upon the blank and means for adjusting such guides to any determinate height, whereby the blank, when heated, will be bent into the desired form.

12. In a machine for making sickles or similar articles from a straight blank, a lower plate for supporting the blank, a curved male die upon the lower plate and of the shape of the sickle or other article to be made, an upper plate adapted to move to force the blank against the die and having a part adapted to lie over and to compress the blank while the latter is being bent, means for moving the upper plate, lateral guides for controlling the upper plate in its movement having a slight lateral play to prevent binding, vertical guides for holding the upper plate down upon the blank and means for adjusting such guides to any determinate height, whereby the blank,

when heated, will be bent into the desired form.

13. In a machine for making sickles or similar articles from a straight blank, a lower plate for supporting the blank, a curved male die upon the lower plate and of the shape of the sickle or other article to be made, an upper plate adapted to move to force the blank against the die and having a part adapted to lie over and to compress the blank while the latter is being bent, and means for moving the upper plate, lateral guides for controlling the upper plate in its movement having a slight lateral play to prevent binding, vertical guides for holding the upper plate down upon the blank, bolts and nuts for securing the guides to the lower plate, holes in the vertical guides and lower plate for the bolts, slots in the lateral guides for the bolts having the longer axes of the slots running in a direction transverse to the length of the machine to permit of a slight lateral play to the guides and upper plate, whereby the blank, when heated, will be bent into the desired form.

14. In a machine for making sickles or similar articles from a blank, a lower plate for supporting the blank, a curved die of the shape of the sickle or other article to be made, an upper plate adapted to move to force the blank and the die together and having a part adapted to lie over and to compress the blank

while the latter is being bent, and means for moving the upper plate, and a lever and arm adapted to be pressed against the upper plate when moved into its forward position, to force the plate into its backward position, whereby the blank, when heated, will be bent into the desired form.

15. In a machine for making sickles or similar articles from a straight blank, a lower plate for supporting the blank, a curved male die upon the lower plate and of the shape of the sickle or other article to be made, an upper plate adapted to move to force the blank against the die and having a part adapted to lie over and to compress the blank while the latter is being bent, means for moving the upper plate to cause it to force the blank against the die and means for returning the upper plate to its original position, and a lever and arm adapted to be pressed against the upper plate when moved into its forward position, to force the plate into its backward position, whereby the blank, when heated, will be bent into the desired form.

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

EDWARD D. WOODS.

Witnesses:

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JOHN P. GEMPLER.