

G. K. SNOW.
Improvement in Machines for Cutting out Collars.
No. 132,544. Patented Oct. 29, 1872.

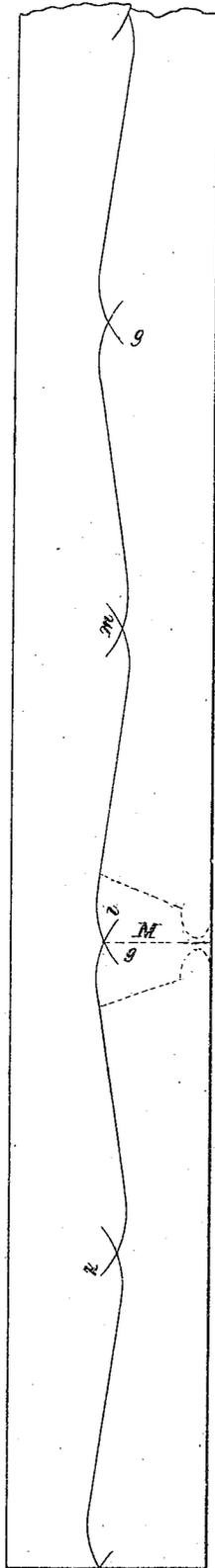


FIG. 1.

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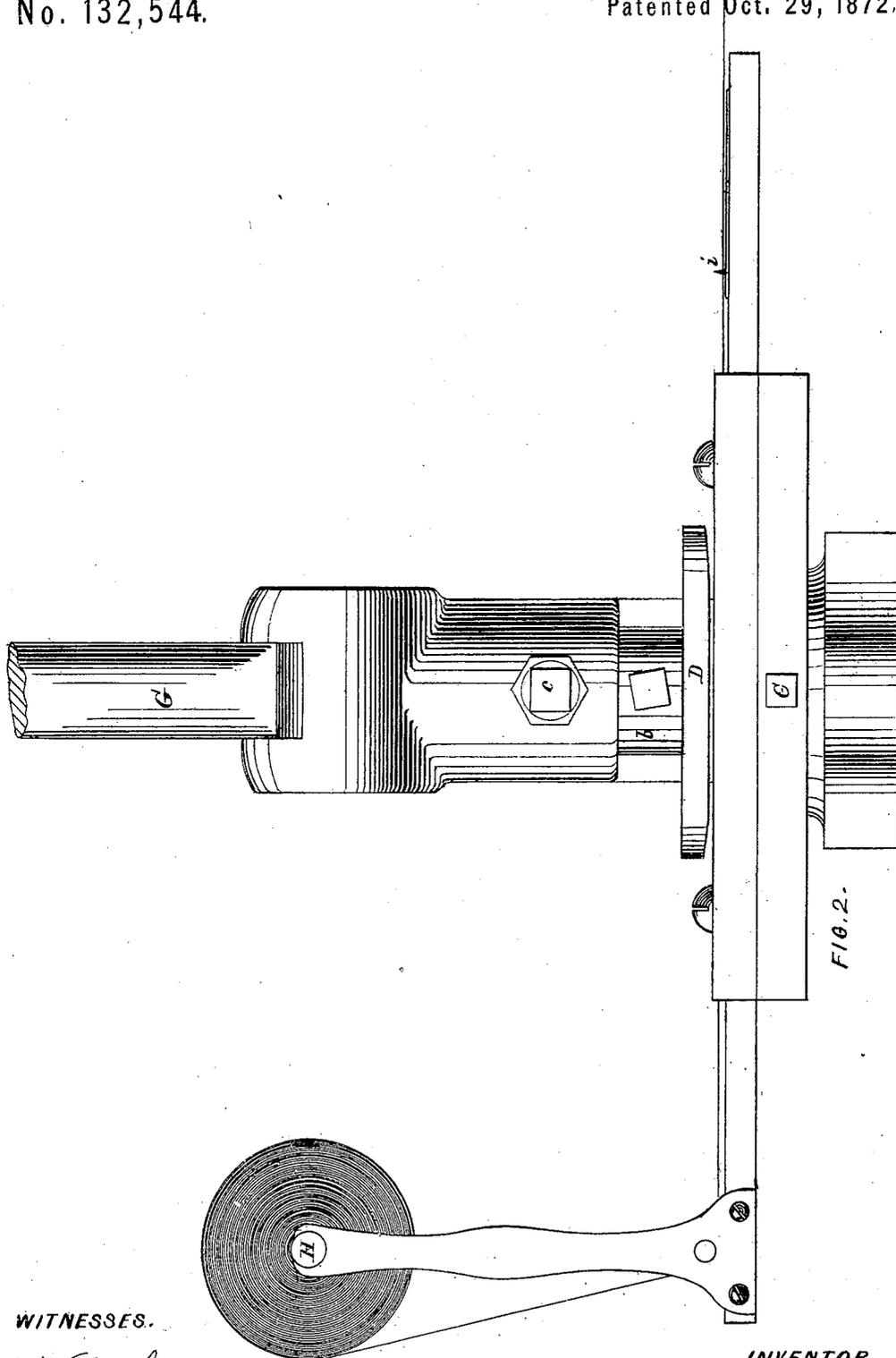


FIG. 2.

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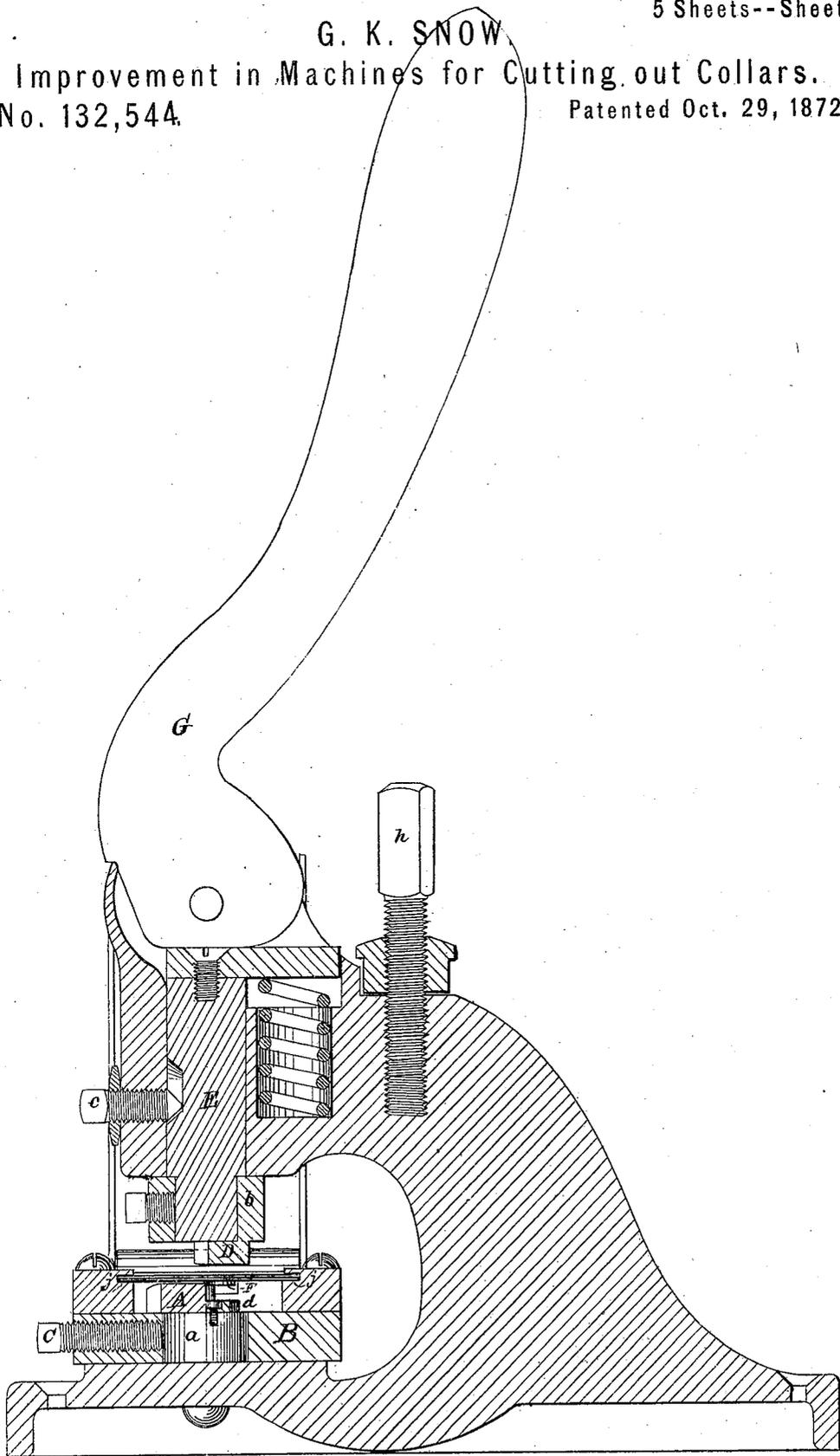
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FIG. 3.

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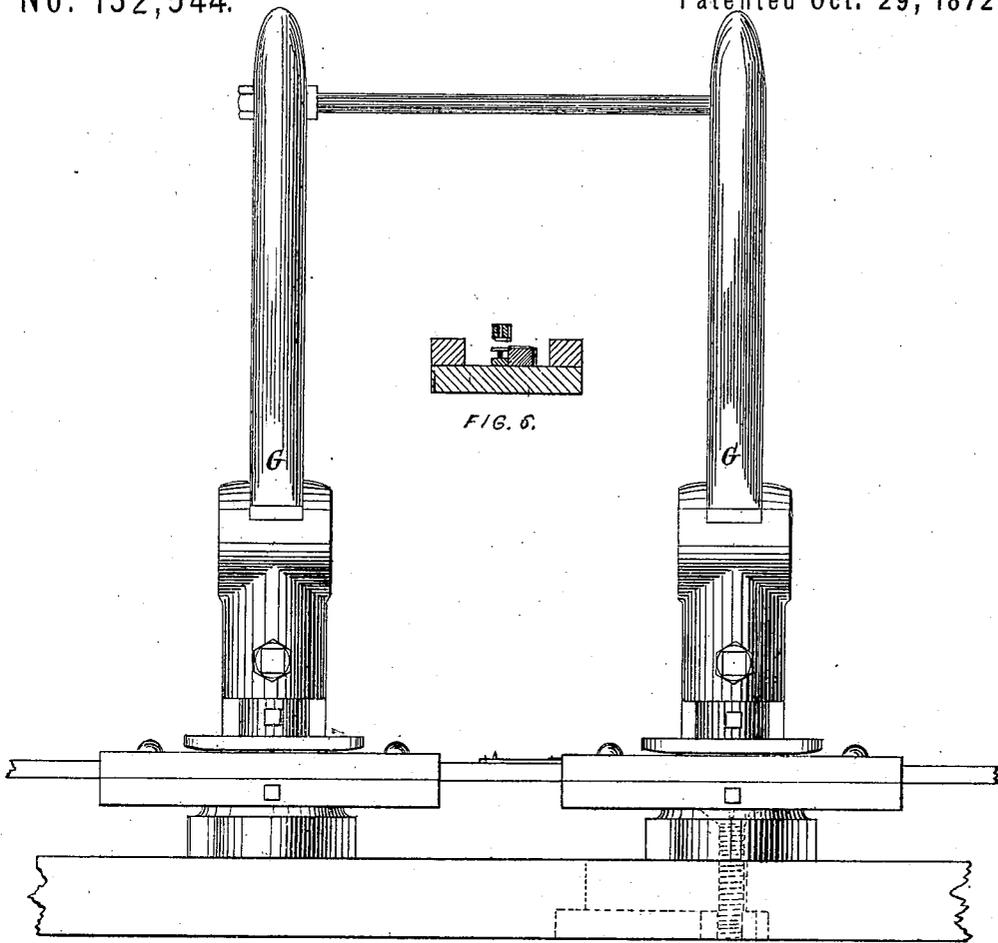


FIG. 6.

FIG. 4.

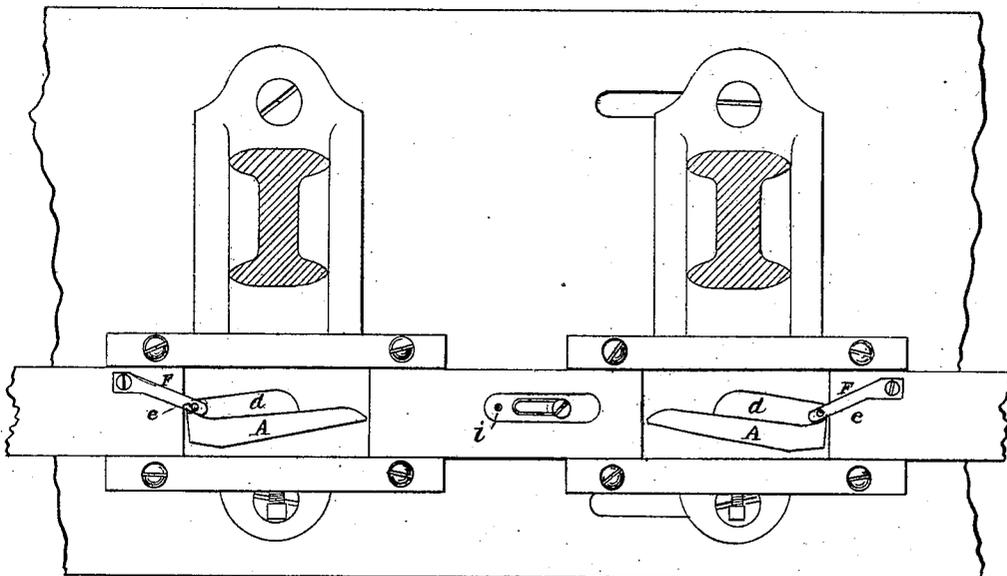


FIG. 5.

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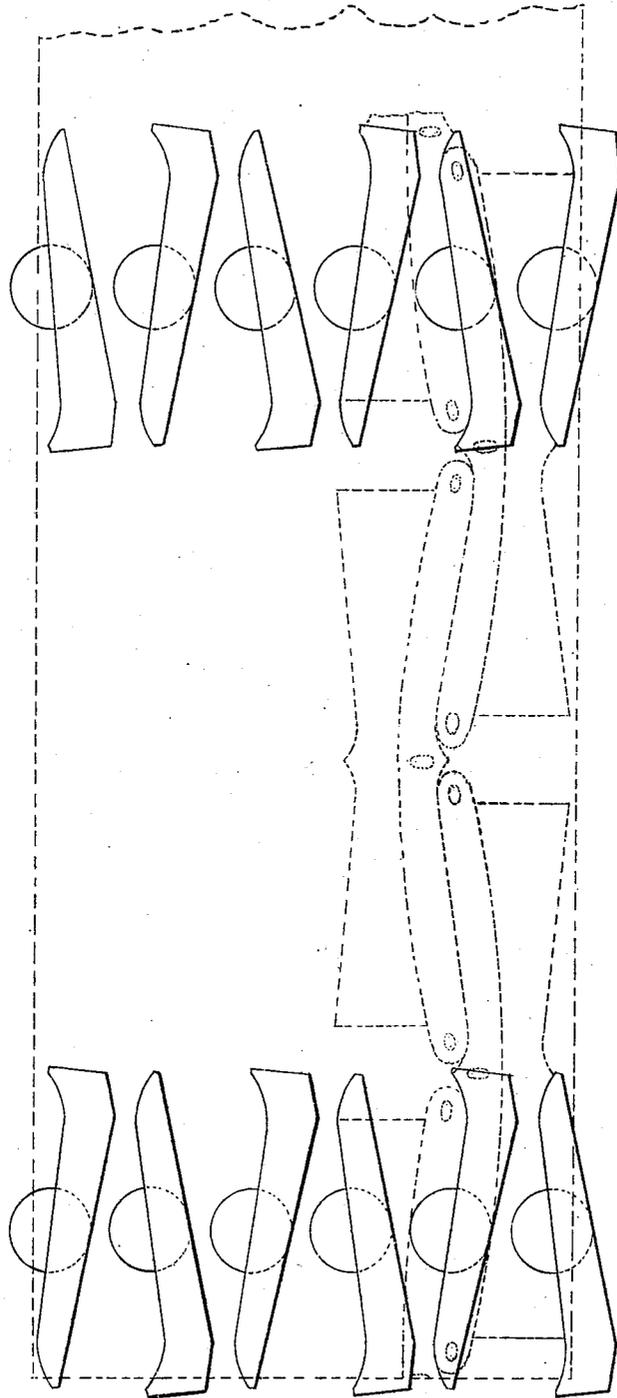


FIG. 7.

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UNITED STATES PATENT OFFICE.

GEORGE K. SNOW, OF WATERTOWN, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR CUTTING OUT COLLARS.

Specification forming part of Letters Patent No. 132,544, dated October 29, 1872.

To all whom it may concern:

Be it known that I, GEORGE K. SNOW, of Watertown, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Cutting Out Collars, of which the following is a specification:

My invention relates to the form and arrangement of dies by which a strip of material having two straight and parallel edges is divided into two or more strips by a line or lines of cut other than a straight line, in accordance with the conditions described in another application for a patent of even date with this, by which an important saving in material is effected; and it consists, first, in the use of a pair of dies or cutters, the cutting-edges of which are so formed and of such a length that when brought together with a piece of paper between them they will cut a slit therein of a suitable length and shape to form one-half of the top or bottom of a collar, said cuts being at such an angle to the edge of the strip as to give the desired width to the end and middle of a collar, and being repeated at intervals equal to the length of a collar, leaving a space between each two cuts of nearly equal length to the cut made, to be separated by another pair of cutters made of the reverse shape, or by the same cutters, by turning the paper over and passing it through the machine the second time. It also consists in making the under face of one of said cutters curved upward at either in combination with a means of limiting the downward movement of the movable cutter, so that the same dies may be used to cut for all lengths of collars. It further consists in so securing the dies in the machine that the angle of their cutting-edges may be readily and easily changed with relation to the edges of the strip of paper, so as to cut a variety of styles of collars with the same dies or cutters. It further consists in the use, in combination with dies or cutters for cutting collars, of a punch and die for making a register-hole for adjusting the paper properly to the cutters in the succeeding operations. It also consists in shaping the separating-dies so that the line of cut made thereby shall cross the line of the cuts next before and next after it at their points of junction, for the purpose of insuring the complete severing of the parts.

It also consists in the combination of two pairs of dies or cutters, arranged to cut curved slits the reverse counterparts of each other and parts of the same dividing-line, said dies being located a distance apart corresponding to the length of the collars, and arranged to work in unison with each other, and made adjustable to or from each other. It also consists in the arrangement of a single or double series of said cutters side by side, so that a web of material fed endwise thereto may be cut into strips from which collars may be formed, as will be described.

Figure 1 of the drawing represents a plan of a portion of a strip of paper of suitable width for two collars, and showing the line of cuts for dividing the same into two. Fig. 2 is a front elevation of a hand-machine illustrating my invention. Fig. 3 is a section on line $x x$ on Fig. 2. Fig. 4 is a front elevation of a modification, showing two pairs of cutters arranged to be operated in unison. Fig. 5 is a horizontal section on line $z z$ on Fig. 4; and Fig. 6 is a transverse section of the cutting-dies, showing the dies for punching the register-holes. Fig. 7 is a plan of a series of the severing-dies, arranged to cut a web of the material into strips of the proper width and shape to form collars by cutting out the stock between the contiguous ends of two collars.

A is the lower or bed-cutter, the cutting-edge of which is curved to the shape it is desired to give to the top or bottom of the collar, and of a length a little in excess of half the length of the longest collar, said die being secured to the bed B of the machine by means of a circular hub, a , projecting downward from the center thereof, and fitted to a suitable socket in the bed B, and secured therein by the set-screw C. D is the upper or movable cutter, shaped to fit the cutter A, and provided with a hub, b , by which it is attached to the plunger or cross-head E of the machine, where it is secured by the set-screw c . This mode of securing the cutters to the bed and cross-head is adopted to enable them to be adjusted to any desired angle to the line of feed for the purpose of varying the style of the collar to be produced. An arm, d , is secured to the hub a of the cutter A, and projecting therefrom in a horizontal position alongside of the cutting-edge of the die A carries at

its end and near the end of the die A, the punch *e*, which works in unison with the female die *f* formed in the cutter D, to punch the register-holes, as shown at *g*, Fig. 1. F is a spring, secured to the bed near the punch *e*, to lift the paper off from said punch after the register-hole is punched. An adjustable register-pin, *i*, is secured to the bed of the machine to determine the length of the paper to be fed at each movement of the cross-head. G is a cam-lever, by means of which the upper cutter is operated, and *h* is an adjustable stop to limit the movement of said lever, and, consequently, the depth to which the upper die can descend and the length of slit cut thereby, the lower face of the upper die D being curved upward at either end for that purpose, as shown in Fig. 2. H is a shaft, upon which is mounted the roll of paper to be divided, the paper being guided under the cutter by the grooves *j*, which effectually prevent the paper from being lifted by the upward movement of the upper cutter.

The paper or other material is fed to the die by hand, the hole formed by the punching-dies being placed over the register-pin *i* to determine the position, when the cam-lever G is thrown back so as to depress the upper cutter and cut a curved slit through the material, as shown from *k* to *l* in Fig. 1. The paper is then moved forward again a distance equal to the length of the collar to be cut, the distance between the punch *e* and the register-pin *i* being at all times adjusted to the length of the collar it is intended to produce. As the cutting-die is but a little longer than one-half of the longest collar, it is evident that if the material is moved a distance equal to the length of a collar that when the material has passed through the machine it will not be divided, but will have a series of curved slits cut through the same, a portion of the material between each pair of said slits nearly equal to half the length of the collar remaining uncut. To complete the division with a single pair of cutters the strip of material is turned the other side up, and passed through the machine a second time the cutters acting upon the uncut portions, the cuts thus formed being curved in the reverse direction to those previously made, and slightly crossing the same at the points of intersection, as shown at *k*, *l*, and *m*, Fig. 1.

A complete division of the strip may be accomplished by one passage through the machine by using two cutting-dies, arranged to cut curved lines the reverse of each other, the distance between said cutters from center to center being equal to one and a half times the length of a collar, said cutters being so arranged that they may both be operated by one movement, as shown in Figs. 4 and 5. When two pairs of cutters are used they must be arranged so that they may be adjusted with relation to each other in order to adapt them to cut different lengths of collars, as shown in Figs. 4 and 5.

After the material has been prepared, as described, in strips having one straight edge and one edge cut into a series of double reversed curves, as shown in Fig. 1, said strips of material are fed under another pair of dies, (not shown in the drawing,) by which the ends of the collars are shaped by cutting out a piece of waste, as shown by dotted lines at M in Fig. 1.

When it is desired to cut a shorter collar the stop-screw *h* is turned out so as to shorten the movement of the lever G, and, consequently, reduce the depth to which the upper cutter will descend by virtue of the curved under surface of said cutter, shorten the slit which will be cut thereby; and, if the two pairs of cutters are used, they must be adjusted in relation to each other. The register-pin *i* must also be adjusted in relation to the register-punch *e* to adapt the machine to different lengths of collars.

It is evident that the cross-head may be operated by power, and the strip of material may be fed to the dies automatically, and the stitching and line of fold may be embossed thereon and the button-holes cut therein at the same time that the cutting is performed, if desired.

A series of the cutters above described may be arranged on a single cross-head in such a manner that a number of strips may be cut at the same time from a web or roll of collar material, a pair of rotary cutters being used between each pair of shear-cutters so as to form the straight edge of the strips; or the rotary cutters may be dispensed with and a continuous series of curved cuts be formed, a sufficient number of the curved shear-dies being used to cut a web of collar material endwise to said dies into strips having two curved edges of suitable shape to form the top and bottom edges of a collar.

By virtue of the peculiar shape of the cut made at each movement of the dies, and the relation of the first to the second cut, the lines of the two cuts will cross each other at their intersection just enough to insure a complete separation of the material, the extent of said crossing being limited by the adjustment of the vertical movement of the die.

It will be seen by reference to Fig. 1, that the collar made will have a projecting point in the center of the top or bottom edge at *m*, which point, of necessity, varies with the variations in the length of the collar, it being somewhat larger in the longest collars, and almost entirely disappearing when the shortest collars are cut, owing to the fact that the curved edge of all the different sizes of collars are cut by the same cutters, the different lengths being obtained by varying the vertical movement of the movable die and the feed of the material, and, in case of the use of two sets of cutters, in adjusting said cutters toward or from each other. This projecting point or ear, in the center of the longer collars, is cut from what otherwise would be waste, and en-

ables me to make equally as serviceable a collar from less material than heretofore, for the reason that, when said point is on the bottom of the collar, it serves to strengthen the button-hole while the band on either side thereof may be made narrower than usual, so that two series of collars may be cut from a narrower strip of material than could be done if said projection were not used. When the bottom of the collar is made straight, and the top curved, the projecting point or ear will be in the center of the top or turn-over portion of the collar, and serves to cover the center button-hole, even though the sides of the turn-over portion be quite narrow.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The cutting-dies A and D arranged and applied to the bed and cross-head as herein set forth, so that the angle of the cut may be readily and easily adjusted to change the shape of the collar, substantially as described.

2. A pair of dies for separating paper or other material by a single line of cut, the cutting edge of one or both of which is so formed at its ends that the length of cut made thereby may be varied by varying the travel of the moveable die, substantially as described.

3. In combination with a pair of cutters, one or both of which has its cutting-face curved, so that the length of the cut made thereby may be varied by varying the travel of the movable die, I claim an adjustable stop to limit the movement of the movable die, substantially as described.

4. In combination with the cutters A and D, arranged as set forth, I claim the punch *c* and die *f*, constructed and operating substantially as described, for the purpose specified.

5. The combination of two pairs of cutting-dies arranged to cut curved slits which are the reverse counterparts of each other, and forming parts of a continuous line of separation, substantially as described.

6. I claim the adjustable register-pin *i* for determining the position of the paper for the successive cuts, substantially as described.

7. A pair of cutting-dies, arranged and operating as herein set forth, for the purpose of dividing a strip of paper or other material longitudinally into two equal and similar parts by a series of successive cuts, when said dies are so shaped that the line of each successive cut shall slightly cross the line of the cut immediately preceding it, substantially as described, for the purpose specified.

8. The arrangement of two series of cutting-dies working in unison, one of said series being located in advance of the other, and the reverse counterparts thereof in form, so that a web of material fed endwise thereto, and acted upon thereby, will be cut into a series of strips, one or both edges of which are curved, substantially as described.

Executed at Boston this 23d day of July, 1872.

GEO. K. SNOW.

Witnesses:

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