

W. J. BEATTIE.
FOLDING MACHINE.
APPLICATION FILED AUG. 15, 1908.

972,495.

Patented Oct. 11, 1910.

5 SHEETS-SHEET 1.

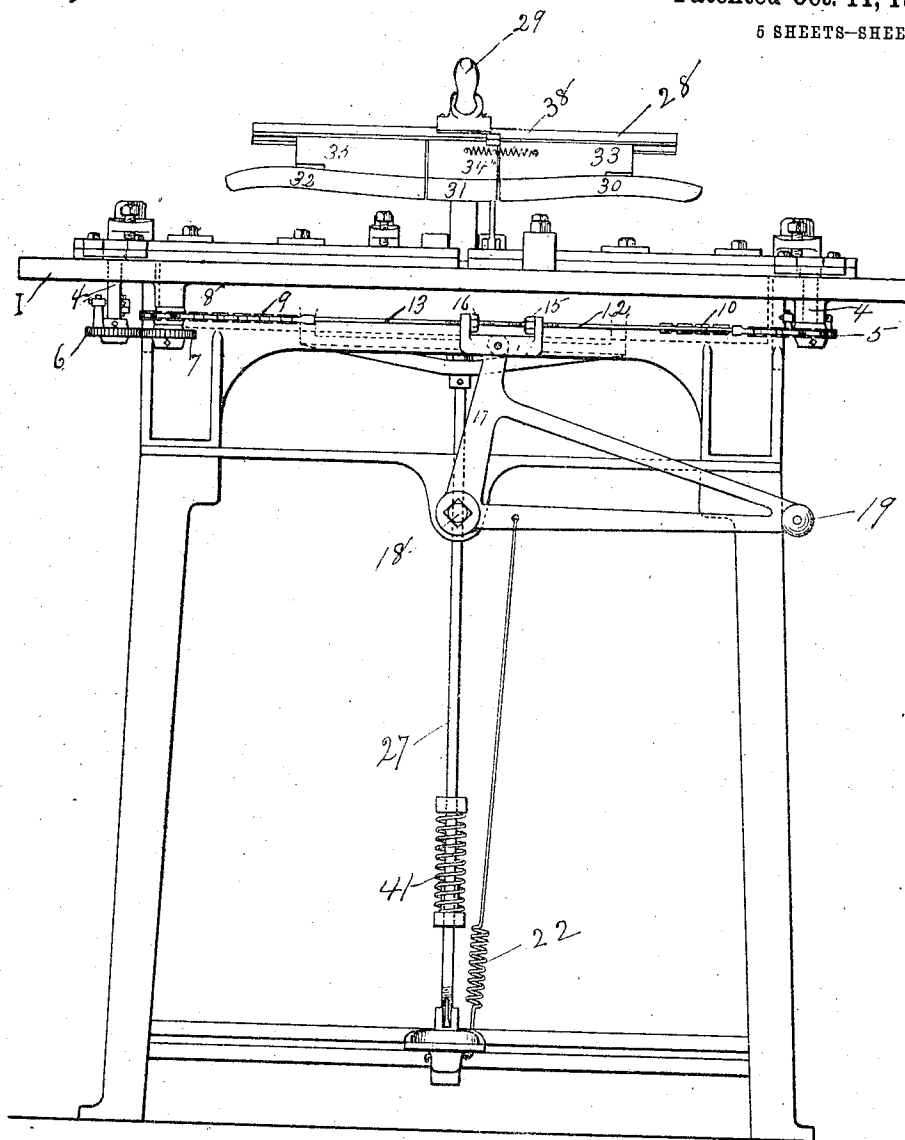


Fig. 1.

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5 SHEETS-SHEET 3.

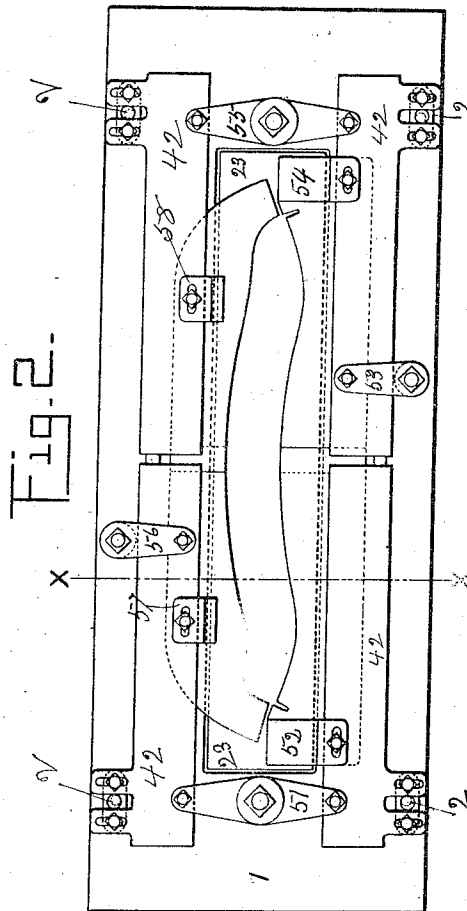


Fig. 2.

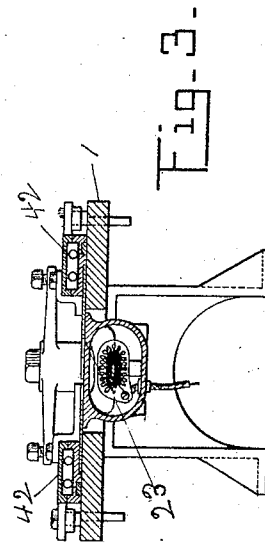


Fig. 3.

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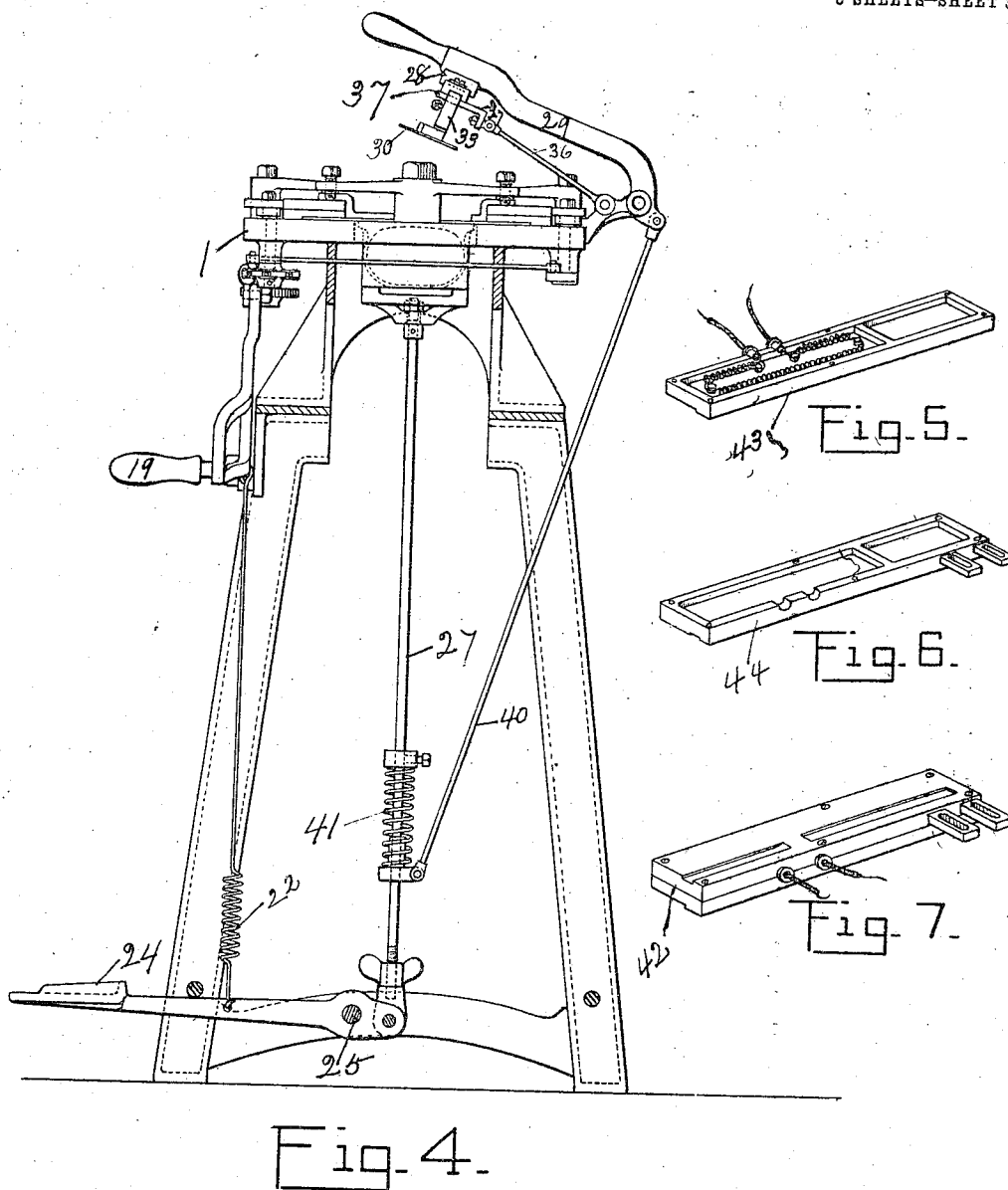
Attorney

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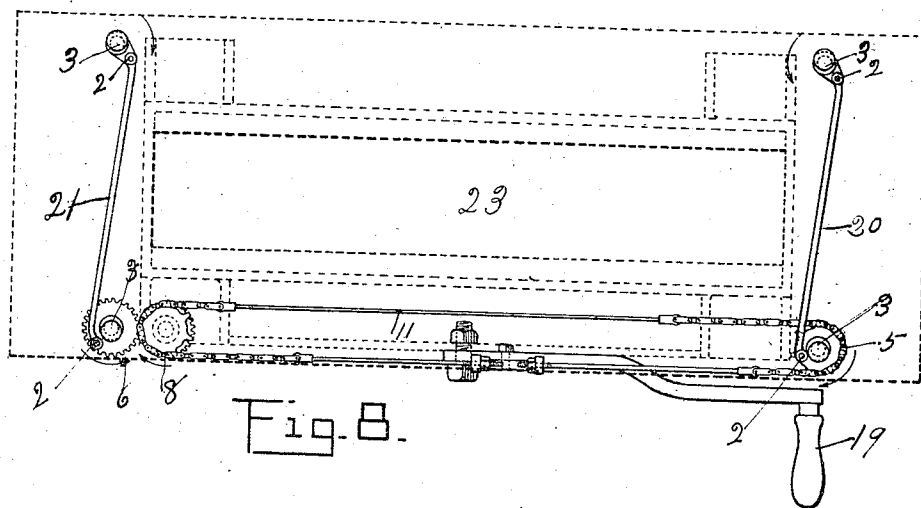


Fig. 8.

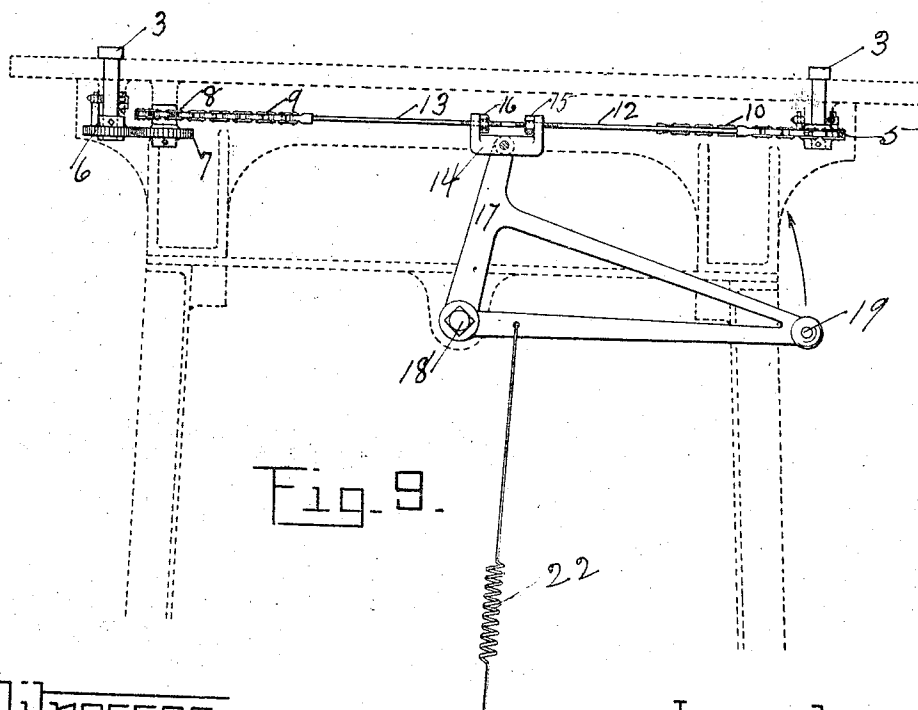


Fig. 9.

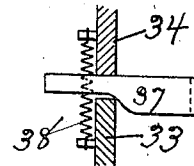
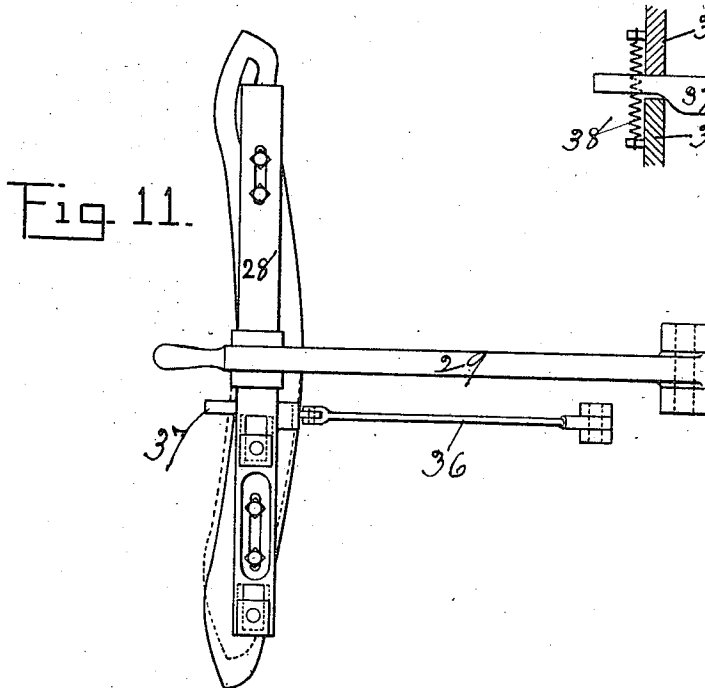
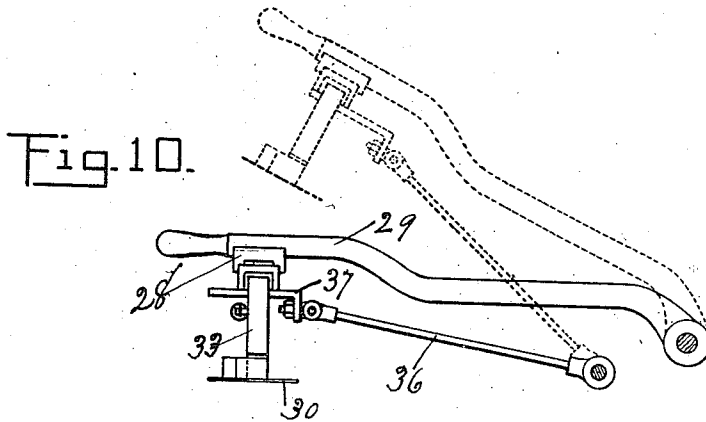
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5 SHEETS—SHEET 5.



Witnesses
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UNITED STATES PATENT OFFICE.

WALTER JOHN BEATTIE, OF COHOES, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS,
TO THE BEATTIE MANUFACTURING COMPANY OF COHOES.

FOLDING-MACHINE.

972,495.

Specification of Letters Patent.

Patented Oct. 11, 1910.

Original application filed May 21, 1908, Serial No. 434,132. Divided and this application filed August 15, 1908. Serial No. 448,664.

To all whom it may concern:

Be it known that I, WALTER JOHN BEATTIE, a citizen of the United States, residing at Cohoes, in the county of Albany and State of New York, have invented certain new and useful Improvements in Folding-Machines, of which the following is a specification.

My invention relates to machines for folding collar and cuff blanks, and the objects of my invention are to construct a folding machine the infolders of which will be heated and the folding and pressing of the goods will be over the edges of the die, while the die is upon the blank upon the bed plate of the machine. I accomplish these objects by means of mechanism illustrated in the accompanying drawings in which:—

Figure 1.— is a front elevation of my machine. Fig. 2.— is a plan view of the bed and folder-plate. Fig. 3.— is a cross section at X—X Fig. 2. Fig. 4.— is an end view with parts broken away. Figs. 5—6 and 7— are detail views of one of the infolders. Fig. 8.— is a plan view of the mechanism operating the infolders. Fig. 9.— is an elevation of the mechanism operating the infolders. Fig. 10.— is a side elevation of the die-head. Fig. 11.— is a plan view of the die-head. Fig. 12.— is a detailed view of the cam for expanding the die.

Similar numerals refer to similar parts throughout the several views.

This application is a division of my application for folding machine, filed May 21, 1908, Serial No. 434,132, and an improvement of the application of George W. Smith, filed February 14, 1908, Serial No. 415,819.

The reference character —1— refers to the surface plate or table of the machine. Upon this table the folding and pressing of the collar and cuff blanks take place. The infolders are located upon the top of this table and are four in number and are arranged to move inwardly folding the edges of the goods over the die upon the heated bed-plate of the machine. This top plate or table of the machine has an open center in which the heated bed-plate of the machine is located. The folding and pressing is done upon this heated bed-plate which is vertically movable and the infolders fold the goods over the die upon this bed-plate

as is described in United States Patent No. 666,766, issued January 29, 1901 to John Maitland and myself. The infolders are operated by cranks 2, 2, attached to the revolving disks 3, outside of the center of the disks. There are four movable infolders which are operated by four cranks 2, working in suitable bearings on the infolders and imparting the motion of an arc of a circle to them, moving them inwardly toward the die when the die is at rest upon the goods upon the heated bed-plates folding the goods upon all sides over the edges of the die.

The revolving disks 3, are mounted upon shafts 4, two of which are located at the front of the machine and two in the rear. Mounted upon the lower end of one shaft located in the front of the machine is a sprocket wheel 5, while upon the lower end of the other front shaft is a gear wheel 6, meshing with the gear wheel 7, mounted upon a suitable bearing as shown in Fig. 9. Also mounted upon the same bearing and fixedly attached to said gear wheel 7, is a sprocket wheel 8.

9 is a short sprocket chain engaging the sprocket wheel 8.

10 is a short sprocket chain engaging the sprocket wheel 5.

11 is a rod connecting one end of the sprocket chain 9 with one end of the chain 10. 12 is a rod attached to the other end of chain 10 and 13 is a rod attached to the other end of the chain 9. The rods 12 and 13 are connected together at their opposite ends by the clip 14, having nuts 15 and 16 by which the tension of the sprocket chains is regulated. The clip 14 is pivoted to the lever 17 as shown at Fig. 9, said lever 17 being pivoted to the machine by the bolt 18 and operated by handle 19. 20 and 21 are two rods connecting the cranks 2, 2, on the front of the machine with crank 2, 2, on the rear of the machine. These parts are so arranged and adjusted that when the operator raises the handle 19, it will move the clip 14 to the left revolving the shafts 4, 4, carrying cranks 2, 2, and the front crank 2, 2, will, by means of the connecting rods 20 and 21, revolve the rear crank 2, 2, and the four cranks 2, 2, will move the infolders inwardly over the die. When the operator releases the handle 19, the spring 22 returns the

lever 17 to the original position thus moving the infolders back from over the die.

In order to press the blanks successfully, it is necessary that the bed-plate and the infolders be thoroughly heated when the pressing takes place.

23 is the heated bed-plate of the machine. The heated bed-plate may be the top surface of a chamber heated by steam, electricity, or by any suitable means. It is vertically movable by means of the pedal 24, turning upon the pivot 25, and pushing upward the rod 27, which bears against the bottom of the movable and heated box or chamber, the top of which forms the heated bed-plate 23 and presses it upward. When the infolders for folding the goods over the die and the goods are ready to be pressed, power is applied to the foot pedal 24 and the heated bed-plate is moved upward and the goods are thus pressed over the edges of the die. When the pressing is completed the pressure is removed from the foot pedal 24, and the heated bed-plate under the die drops down. The infolders are removed from over the die by the spring 22, drawing downward the lever 17 as above described and the die-head is raised carrying with it the die from the bed-plate. The goods having been pressed over the edges of the die are released from the die as hereinafter described.

The collar and cuff blanks to be folded and pressed are of irregular shape and the forms and sizes are changeable. In the drawings I have shown a die for folding a collar blank. The die is of the same shape and size as the collar. I make the die blade of very thin spring steel, and preferably in three sections.

The reference characters 30—31 and 32 Fig. 1, designate the three sections of the die blade. The central section 31 being stationary, the right hand section being movable during the operation of the machine and the left hand section 32 being adjustable longitudinally.

29 is the handle of the die-head and is hinged to the rear part of the machine as shown in Fig. 4. To the handle 29 I attach the bar 28 at right angles to the handle and extending over the bed-plate and at about the length of the collar blank. This bar 28 is fixedly attached to the handle 29 and supports the die, preferably by intermediate plates 33—34 and 35, the central plate 34 being rigidly attached to the bar 28. One of the side plates in this case 33, I attach slidably to the bar 28 and the other plate 35 adjustable so as to lengthen it out to suit the size of the collar or cuff.

36 is an arm hinged to the machine near the rear side thereof at a point nearer the center of the machine than the place where the handle 29 is hinged and is shorter than the handle 29 as shown in Figs. 4, 10 and 11.

37 is a wedge or cam attached to the end

of the arm 36 and adapted to be inserted between the plates 33 and 34, the plate 34 being rigidly attached to bar 28 and the plate 33 being slidably attached to the bar as before described. The cam 37 is adapted to slide the plate 23 carrying the section 30 of the die blade lengthwise. The cam 37 is preferably of the form shown in Fig. 12 the narrow end remaining between the plates 33 and 34 when at rest. The arm 36 being shorter than the handle 29, and being hinged to a point of the machine inside of the hinge to the handle 29 when the latter, is at rest, carrying the die as shown by the dotted lines in Fig. 10, the wide part of the cam 37 is withdrawn from between the plates 33 and 34; and when the handle 29 is brought down so that the die rests upon the bed-plate, the cam 37 will be forced farther between the plates 33 and 34 so that the wide part of the cam 37 will force the plate 33 lengthwise and thus expand the die so that section 30 of the die will occupy the desired position upon the collar blank upon the bed-plate 23. When the die-head is raised the short arm 36 draws the cam 37 out from between the plates 33 and 34 and the spring 38 draws the plate 33 back toward the plate 34 and withdraws the outer end of plate 33 from the fold of the blank which has been pressed over that end of the die so that the blank may be removed by the operator without disarranging the fold of the blank. The die blades may be so attached to the plates 33, 34, and 35 that they may be readily removed and others substituted of the various sizes and shapes to form the style collar or cuff desired. The plate 35 is adjustably attached to the plate 28 so as to be extended for length only.

Attached to a projection of the handle 29, back to the place where said handle is pivoted to the frame of the machine, is the rod 40 the lower end of which bears against the bottom of the spring 41 as shown in Fig. 4 arranged and adjusted so that when the operator presses the die down upon the bedplate of the machine the rod 40 will compress the spring 41 and when the operator releases the handle 29, the spring 41 will raise the die from the bedplate and hold it in a raised position as shown in Fig. 4 leaving the operator free to handle the goods.

51—53—55 and 56 are braces or fingers which are attached to substantial parts of the machine and extend over the infolders when the latter are folding the goods over the die so that when pressure is exerted on the foot-pedal 24 and bed-plate 23 is pressed upward the braces will hold the infolders down and the goods may be thoroughly pressed with as much force as is desired between the infolders and the bed-plate of the machine over the edges of the die.

There is no practical method of directly

heating the die. The goods are pressed over a comparatively cold die. Therefore in order to have a good fold it is necessary that the infolders as well as the bed-plate be
 5 thoroughly heated. The infolders move horizontally in the arc of a circle and it is impracticable and very difficult to heat them by ordinary means. To overcome this difficulty and to thoroughly heat the infolders I
 10 make them hollow and heat them by electricity. The four infolders are alike and are designated on the drawings by the reference number 42. I make each infolder in
 15 two parts, a hollow infolder bar and a thin plate fastened on the under side of said bar. Each infolder bar is made in two sections, as shown in Figs. 5—6 and 7 and has each
 20 section hollow on the end which moves over the die, so that when the two sections are placed together they form a hollow chamber in the portion of the infolder-bar that goes over the die. Into this chamber I place
 25 resistance coils or electric units which may be heated by electricity by wires from without. The resistance coils may have the proper number of turns for the required
 30 number of amperes, this being determined by the amount of heat required to heat the infolders. The feed wires are long enough
 35 so as to not to interfere with the movements of the infolders. In this way the infolders may be kept sufficiently hot for properly folding and pressing the goods over the die and the movements of the infolders do not
 40 interfere with the heating. Constructed in this manner the infolders are always hot when they are moved inward to fold the edges of the goods over the die and make a smooth and uniform fold thereover. The die
 45 is so thin that it is somewhat heated by the bed-plates and the infolders operating from the opposite sides, the die remains within the fold until after the infolders are withdrawn and then as the die-head is raised and the die contracts automatically and with-

draws from the fold of the goods and leaves the fold smooth and uniform in the best possible condition for stitching.

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

1. In a machine for folding collar and cuff blanks, a heated bed-plate, a die adapted to press blanks upon said bed-plate, infolders adapted to move inwardly and fold the edges of the blanks over said die, each of
 55 said infolders being chambered and formed in two parts separably connected together and an infolder plate attached to one of said parts, electric heating means within said chambers adapted to be supplied with current by electric wires from without, where-
 60 by the infolder plate of each infolder may be independently heated, means for moving said infolders to fold blanks over the die, and means for pressing the said blanks be-
 65 tween the heated bed-plate and the folder-plates.

2. In a machine for folding collar and cuff blanks, a heated bed-plate, a die adapted to press blanks upon said bed-plate; slid-
 70 able infolders adapted to move inwardly and fold the edges of the blanks over the edges of said die, each of said infolders comprising an infolder bar and an infolder plate, said infolder bar being hollow and
 75 formed in two sections, each section provided with a peripheral flange, and a partition for dividing the infolder bars into chambers when joined, said chambers adapted to contain means for heating the in-
 80 folders, means for moving said infolders inwardly to fold blanks over the die, and means for pressing said blanks between the heated bed-plate and the infolder-plates.

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

WALTER JOHN BEATTIE.

Witnesses:

WALTER E. WARD,
 FREDERICK W. CAMERON.