Aug. 23, 1949. A. M. MacPHEAT 2,479,949

DEVICE FOR CENTRALIZING STRIP MATERIAL

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FIG. 1

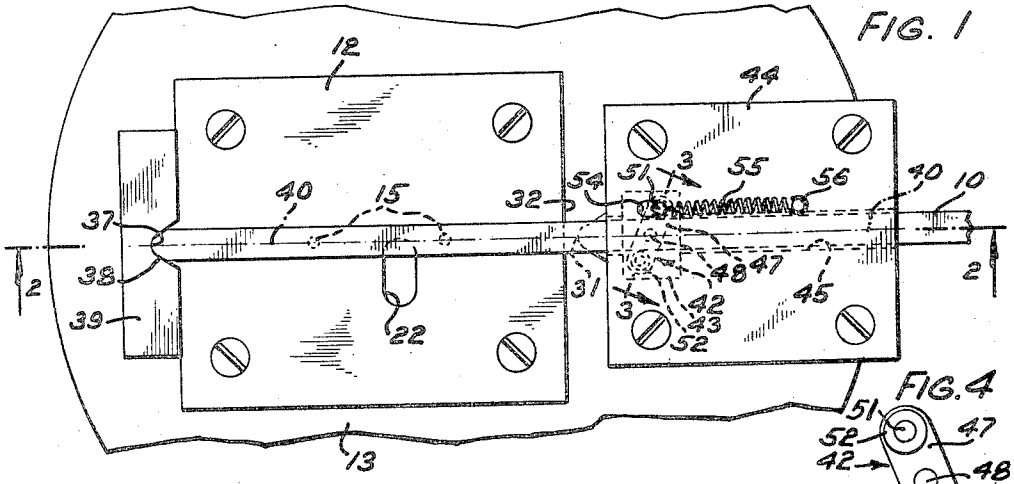
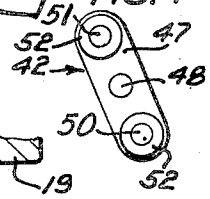


FIG. 4



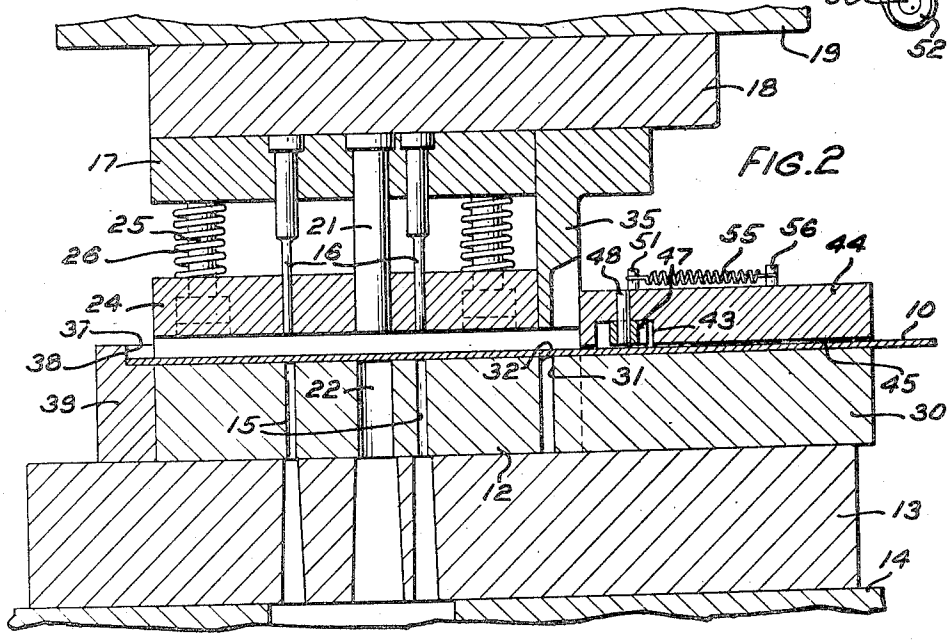


FIG. 2

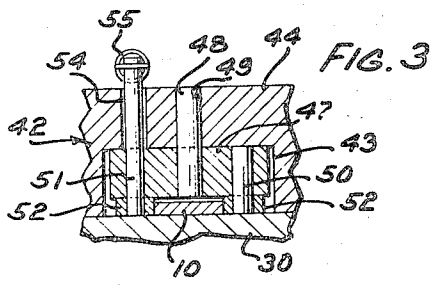


FIG. 3

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FIG. 5

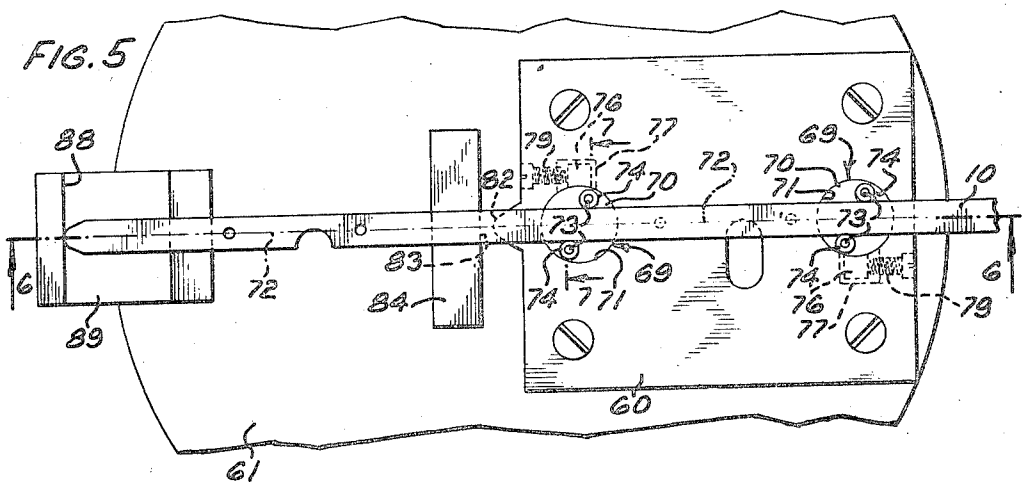


FIG. 6

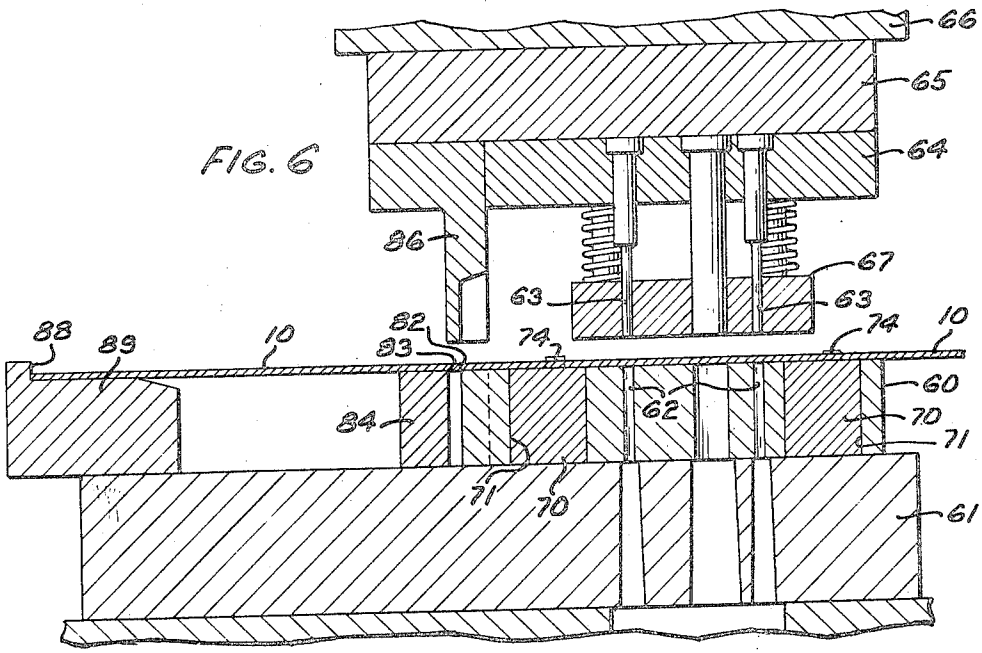
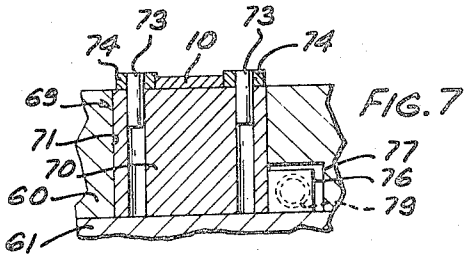


FIG. 7



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DEVICE FOR CENTRALIZING STRIP MATERIAL

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Application September 9, 1947, Serial No. 772,955

9 Claims. (Cl. 164—59)

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This invention relates to a stock centralizing device and more particularly to a centralizing device applicable to a punch press for centralizing the strip stock relative to the tools of the press.

It is an object of the present invention to provide a centralizing device of simple construction for centralizing strip stock relative to a predetermined centerline.

In one embodiment of the invention as applied to a punch press for punching strip stock into contact springs of predetermined length having rounded front end portions, there is provided a block having a notch located on a predetermined centerline for receiving and centralizing the forward end of the stock, and in spaced relation to the block there is provided a member oscillatable about an axis on said predetermined centerline and a pair of rollers mounted diametrically opposite and spaced equi-distant from the axis of the member to receive the strip stock therebetween. The member is stressed for rotation about its axis by a spring to cause the rollers carried by the member to move into engagement with opposite edges of the strip stock and move the stock into predetermined position on the centerline.

In another embodiment of the invention, a pair of cylindrical members are mounted in spaced relation to each other in apertures in the dies for oscillation about axes on a predetermined centerline on which the stock is to be centralized. A pair of diametrically opposed rollers, spaced equi-distant from the axis, are mounted on each of the cylindrical members, and are spaced apart to receive the strip stock therebetween. Each of the cylindrical members is stressed for rotation by a spring to cause the rollers to revolve about the axis of the cylindrical member and engage opposite edges of the strip stock to centralize the stock along the predetermined centerline.

The invention will be more fully understood by reference to the following detailed description thereof and the accompanying drawings illustrating several embodiments of the invention wherein

Fig. 1 is a partial plan view of the lower portion of a punch and die mechanism with the centralizing device associated therewith;

Fig. 2 is a vertical sectional view through the mechanism shown in Fig. 1 and indicated as taken substantially on the line 2—2 thereof;

Fig. 3 is a detail vertical sectional view of a portion of the centralizing device taken on the line 3—3 of Fig. 1;

Fig. 4 is a detail bottom view of a centralizing member with the stock engaging rollers mounted thereon;

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Fig. 5 is a partial plan view of the lower portion of a punch and die construction showing a modified embodiment of the centralizing device associated therewith;

Fig. 6 is a vertical sectional view of the apparatus illustrated in Fig. 5 and taken substantially on the line 6—6 thereof; and

Fig. 7 is a detail vertical sectional view through the centralizing device taken on the line 7—7 of Fig. 5.

Referring to the drawings, there is shown in Figs. 1 and 2 a punch and die construction for operating on strip stock 10 and forming it into spring contact members of predetermined length, each spring member having a rounded forward end and a pair of perforations along its centerline. A die 12 is secured to a die holder 13 which, in turn, is mounted on a platen 14 of the punch press. Die apertures 15 formed in the die block 12 cooperate with a pair of punches 16 for perforating the strip along the longitudinal centerline thereof. The punches 16 are secured, by a retainer member 17, to a punch holder 18, which, in turn, is carried by a ram 19 of the punch press for reciprocation therewith. A notching punch 21, mounted on the punch holder and cooperating with an aperture 22 in the die 12, forms a notch in the side of the strip 10. A conventional stripper plate 24 is mounted on a plurality of headed pins 25 for vertical movement relative to the punches 16 and 21 and is urged downwardly by springs 26 mounted on the pins 25. A die block 30, mounted on the die holder 13, is provided with a curved cutting edge 31 in spaced relation to a straight cutting edge 32 formed on the die block 12. A punch 35 having similarly formed surfaces for cooperating with the cutting edges 31 and 32 is mounted on the punch holder 18 and acts, upon the downward movement of the ram, to shear a blank or slug from the stock 10 and thus sever a completed spring contact member and form a rounded leading edge on the remainder of the strip of stock 10.

The strip 10 may then be advanced over the die block 12, either manually or by any suitable feeding mechanism, until it engages the curved surface 37 of a notch 38 formed in the block 39 mounted on the die holder 13 adjacent the die block 12. The curved surface 37 of the notch 38 serves to centralize the forward end of the stock on a predetermined centerline 40 passing through the axes of the two punches 16 and to stop the

stock in a predetermined position relative to the punch and die.

The other portion of the strip stock above the die 12 is centralized by a centralizing device 42 to bring the centerline of the strip in alignment with the centerline 40. The centralizing device 42 is mounted above the strip 10 in a recess 43 (Figs. 2 and 3) of a stationary stripper member 44, which is mounted on the die 30 and is provided with a guide slot 45 through which the stock 10 is moved. The centralizing device 42 comprises an arm or member 47, to the central point of which is secured a pin 48. The pin 48, mounted in an aperture 49 in the block 44, is positioned with its axis on the centerline 40 (Fig. 1) so that the member 47 may oscillate about an axis on said centerline. A pair of diametrically opposed pins 50 and 51 are mounted in the member 47 equi-distant from the axis of the pin 48 and project downwardly from the member 47 to receive a pair of rollers 52—52 thereon. The rollers 52 are held in position between the lower surface of the member 47 and the top surface of the die 30 and are spaced apart a distance greater than the width of the strip to receive the strip 10 therebetween. The pin 51 (Fig. 3) extends upwardly through a slot 54 in the stripper 44 and is connected to one end of a spring 55, the other end of which is connected to a pin 56 on the stripper 44. The spring 55 tends to rotate the member 47 and move the rollers 52—52 equal amounts about the axis of the pin 48 toward the centerline 40. Thus the rollers 52 will engage the opposite edges of the stock 10 to accurately centralize the intermediate portion of the stock on the centerline 40.

From the foregoing, it will be seen that the rounded forward end of the strip stock, as it engages the curved walls of the notch 33, is stopped and centralized thereby and the intermediate portion of the stock is automatically centralized by the centralizing device 42, whereby the stock is accurately positioned with respect to the centerline 40, and that when the ram 19 descends, the perforating and notching dies act to perforate and notch the strip and the punch 35 acts to sever the contact strip from the stock and form a rounded end on the remainder of the strip 10.

In another embodiment of the invention illustrated in Figs. 5 to 7, the die 60, mounted on a die holder 61, has formed therein a pair of apertures 62—62 forming cutting edges which cooperate with a pair of punches 63—63 to perforate the strip stock 10 at predetermined points along the centerline thereof. The punches 63 are secured by a retainer member 64 to the punch holder 65, which is secured to and reciprocates with a ram 66 of the punch press. A stripper block 67, yieldably mounted on the punch holder 65 for vertical movement relative to the punches, serves to hold the strip 10 in position on the die 60 during the punching operation. The stock strip 10 is guided for movement on a die block 60 and centralized thereon by a pair of centralizing devices 69—69. Each centralizing device 69 comprises a cylindrical member 70 mounted for rotation in cylindrical apertures 71 in the block 60. The cylindrical members 70 rest upon and are supported by the die holder 61 and have their upper flat surfaces flush with the upper surface of the die 60 and are rotatable about axes located on a centerline 72 passing through the axis of the punches 63—63. A pair of diametrically opposed pins 73, mounted equi-distant from the

axis of the member 70, extend upwardly from the member 70 and have rotatably mounted thereon rollers 74—74, which are spaced from each other a distance slightly greater than the width of the strip stock 10 for receiving the strip stock 10 therebetween. The rollers 73 are of a height in excess of the thickness of the stock 10 and are adapted to engage the opposite edges of the stock when the members 70 are rotated to move the stock into a predetermined position with the centerline thereof in alignment with the centerline 72. Laterally extending lugs 76 are formed on members 70 and fit in recesses 77—77 in the die 60 and serve to limit the rotary movement of the member 70. Helical compression springs 79, mounted in recesses in the die 60, engage the lugs 76 and stress the cylindrical members 70 for rotation. The rotary movement of the cylindrical member 70 carries the rollers 74—74 about the axis of the member 70 and causes them to move simultaneously toward the centerline 72 and engage the opposite edges of the stock strip 10 to accurately centralize the strip 10 on the centerline 72. The die 60, at one end thereof, is provided with a curved shearing edge 82 in spaced relation to a shearing edge 83 formed on the die 84, mounted on the die holder 61. The shearing edges 82 and 83 cooperate with similarly formed edges on a punch 86 carried by the punch holder 65 upon reciprocation of the ram to punch a blank or slug from the strip 10 and form a rounded end on the strip at the same time that the punches 63—63 perforate the strip. Upon completion of the punching operation, the strip may be advanced until the rounded forward end thereof engages a stop surface 88 of a block 89 mounted on the die holder 61. The stop surface 88 serves to stop the strip 10 in a predetermined position relative to the die so that, upon the following downstroke of the ram, the punch 86, as it punches the blank from the strip, severs the completed contact spring from the strip simultaneously with the perforating action of the perforating punches 63. In this construction of centralizing device, it will be seen that the stock is guided for movement along the predetermined centerline 72 by the rollers 74, which are yieldingly urged for equal movement in opposite directions toward the centerline 72 and into engagement with the strip, thus to accurately centralize the strip 10 on the centerline 72.

What is claimed is:

1. In a device for centralizing strip stock on a predetermined centerline in a machine for processing said stock, the combination of means supporting the strip stock for feeding movement along said centerline, an oscillatable member, a pair of rollers mounted on said member and spaced apart from each other a distance greater than the width of the stock, means mounting said member for oscillation about an axis midway between the axis of said rollers and on said predetermined centerline and with the rollers positioned to engage the edge portions of said stock, and spring means for stressing said member for rotary movement to cause said rollers thereon simultaneously to move in opposite directions toward the centerline to centralize the strip stock.

2. In a device for centralizing strip stock on a predetermined centerline in a machine for processing said stock, the combination of means supporting the strip stock for feeding movement along said centerline, a pair of centralizing means in spaced relation to each other on said

centerline, one of said centralizing means comprising an oscillatable member, a pair of rollers mounted on said member and spaced apart from each other a distance greater than the width of the stock, means mounting said member for oscillation about an axis midway between the axis of said rollers and on said predetermined centerline and with the rollers positioned to engage the edge portions of said stock, and spring means for stressing said member for rotary movement to cause said rollers thereon simultaneously to move in opposite directions toward the centerline to centralize the strip stock.

3. In a device for centralizing strip material on a predetermined centerline, the combination of a support for said strip, an oscillatable member mounted for pivotal movement about an axis on said predetermined centerline, a pair of members on said oscillatable member having a pair of strip engaging elements thereon diametrically opposed and spaced equi-distant from said axis and spaced apart a distance greater than the width of said strip for receiving the strip therebetween, and a spring operatively connected to said oscillatable member to stress said member for turning movement about said axis to cause said strip engaging elements simultaneously to move in opposite directions toward the centerline to engage the edges of and centralize the strip.

4. In a device for centralizing strip material on a predetermined centerline, the combination of a support for said strip, and a pair of centralizing means in spaced relation to each other on said centerline, one of said centralizing means comprising an oscillatable member mounted for pivotal movement about an axis on said predetermined centerline, a pair of members on said oscillatable member having a pair of strip engaging elements thereon diametrically opposed and spaced equi-distant from said axis and spaced apart a distance greater than the width of said strip for receiving the strip therebetween, and a spring operatively connected to said oscillatable member to stress said member for turning movement about said axis to cause said strip engaging elements simultaneously to move in opposite directions toward the centerline to engage the edges of and centralize the strip.

5. A device for centralizing strip material on a predetermined centerline comprising a member having positioning surfaces engageable with the forward end of said strip for centralizing said forward end of the strip on said centerline, and a centralizing device engageable with an intermediate portion of said strip comprising an oscillatable member mounted for pivotal movement about an axis on said predetermined centerline, a pair of rollers mounted on said oscillatable member diametrically opposite and equi-distant from said axis and spaced apart a distance greater than the width of said strip to receive said strip therebetween, and a spring operatively connected to said oscillatable member for stressing said member for turning movement about said axis to cause the rollers thereon simultaneously to move in opposite directions toward the centerline to engage opposite edges of said strip and centralize the intermediate portion of said strip.

6. A centralizing device for strip material comprising a pair of centralizing means in spaced relation to each other and engageable with said strip material at spaced points for centralizing said strip on a predetermined centerline, each of said means comprising a member mounted for pivotal movement about an axis on said predetermined centerline, a pair of rollers mounted on said member diametrically opposite and equi-distant from said axis and spaced apart a distance greater than the width of said strip to receive said strip therebetween, and resilient means stressing said member for turning movement about the axis to cause said rollers simultaneously to move in opposite directions toward the centerline to centralize the strip.

7. In a device for centralizing a strip of material on a predetermined centerline, a strip supporting member having a cylindrical recess the axis of which is located on said predetermined centerline, a cylindrical member mounted in said recess for rotation about said axis, a pair of rollers mounted on said cylindrical member diametrically opposite and equi-distant from said axis and spaced apart a distance greater than the width of the strip for receiving the strip therebetween, and a spring operatively connected to said cylindrical member for urging said member for rotation to cause said rollers simultaneously to move in opposite directions toward the centerline for engaging the opposite edges of and centralizing the strip.

8. A centralizing mechanism for strip material comprising a pair of centralizing devices in spaced relation to each other longitudinally of said strip and engageable with said strip material for centralizing said strip on a predetermined center line, one of said centralizing devices comprising a member mounted for pivotal movement about an axis on said predetermined center line, a pair of strip engaging elements mounted on said member diametrically opposite and equi-distant from said axis and spaced apart a distance greater than the width of said strip to receive said strip therebetween, and means for stressing said member for turning movement about said axis to cause said elements simultaneously to move in opposite directions toward the center line to centralize said strip.

9. In a device for centralizing strip material on a predetermined center line, the combination of a support for said strip, an oscillatable member mounted for pivotal movement about an axis on said predetermined center line, a pair of strip engaging elements on said oscillatable member diametrically opposite and spaced equi-distant from said axis and spaced apart a distance greater than the width of said strip for receiving the strip therebetween, and means for stressing said member for turning movement about said axis to cause said strip engaging elements simultaneously to move in opposite directions toward the center line to engage the edges of and centralize the strip.

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No references cited.