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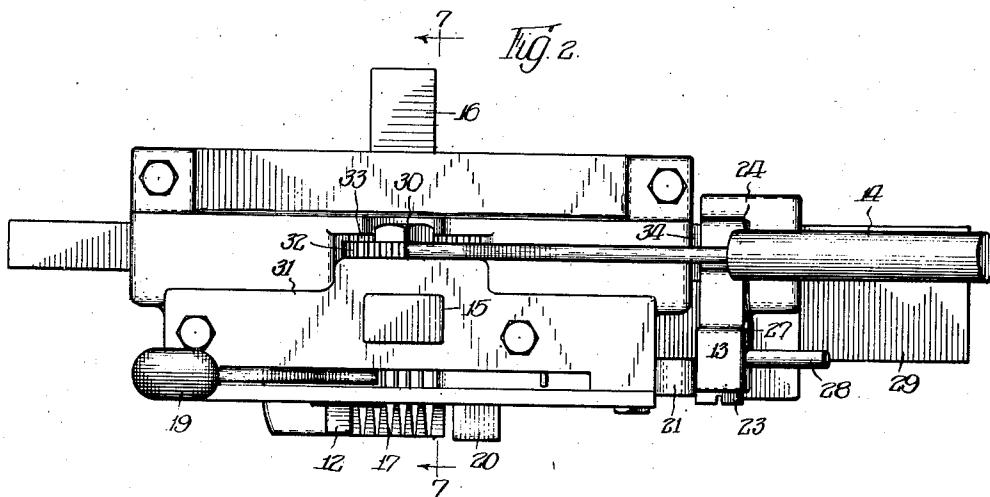
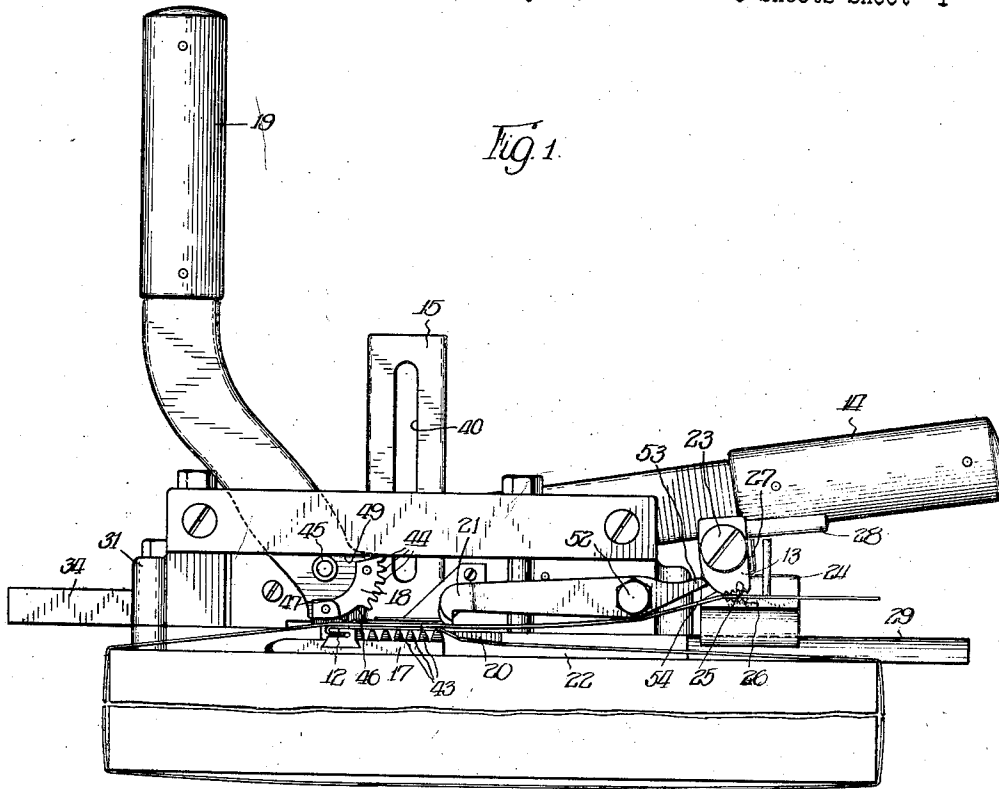
P. WRIGHT

1,836,147

BAND FASTENING MACHINE

Filed July 13, 1927

3 Sheets-Sheet 1



Witness:
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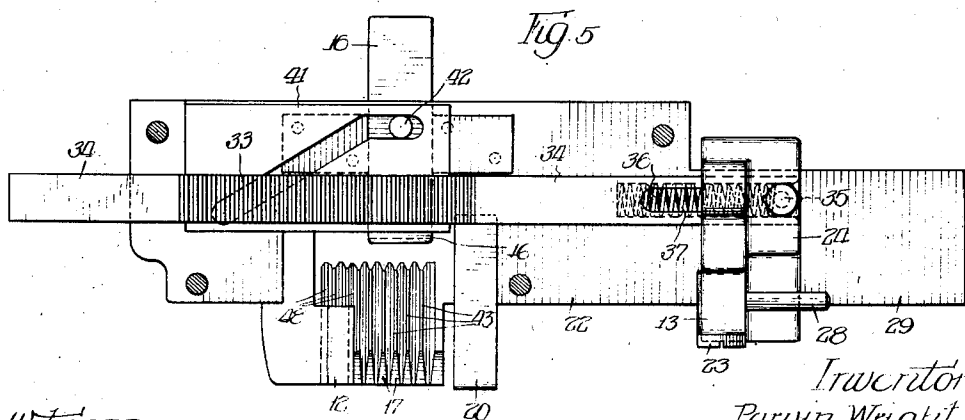
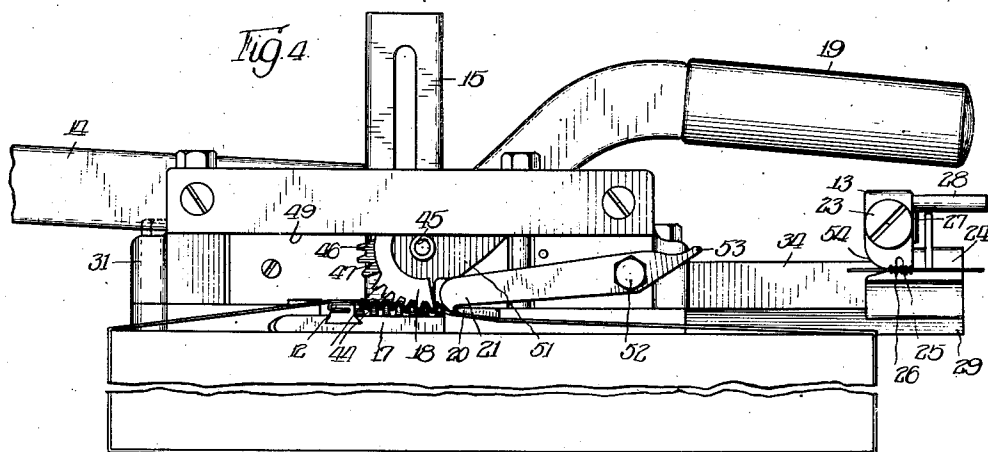
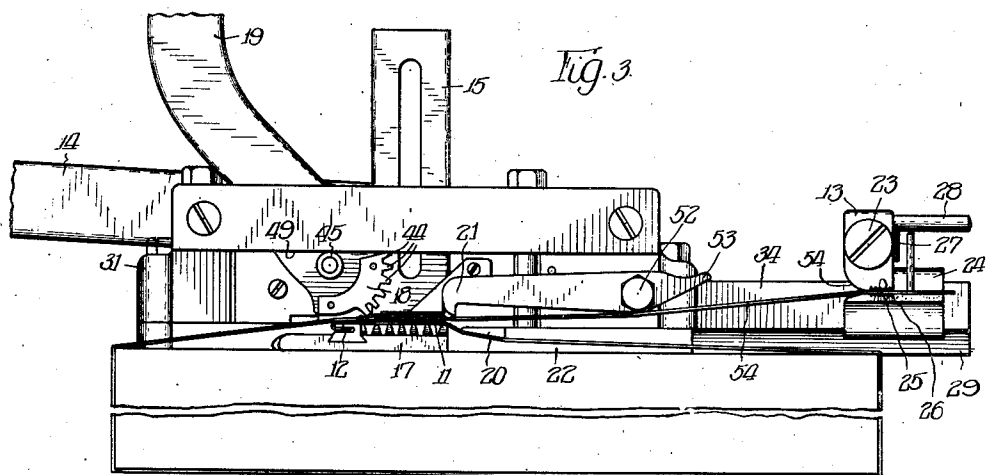
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1,836,147

BAND FASTENING MACHINE

Filed July 13, 1927

3 Sheets-Sheet 2



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1,836,147

BAND FASTENING MACHINE

Filed July 13, 1927

3 Sheets-Sheet 3

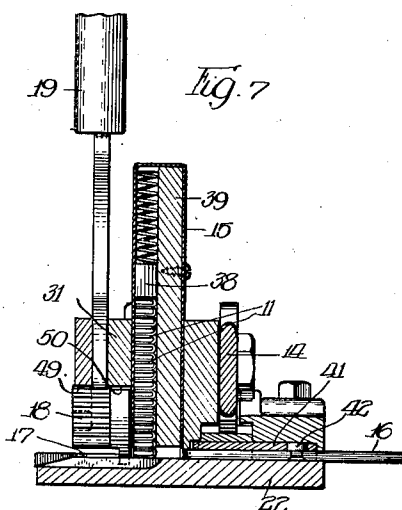
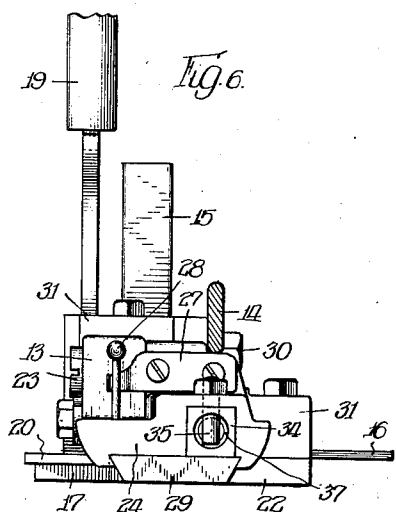


Fig. 9.



Fig. 8.

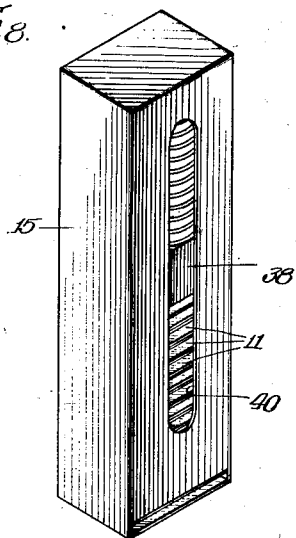
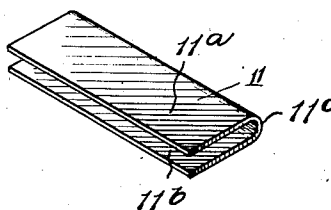


Fig. 10.



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UNITED STATES PATENT OFFICE

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BAND FASTENING MACHINE

Application filed July 13, 1927. Serial No. 205,399.

The present invention has to do with machines for use in fastening flat wire bands around boxes, bales and other kinds of containers.

5 One of the principal objects of the invention is to provide, in such a machine, means for feeding a fastening clip into proper position with respect to the ends of the band.

Another important object is to provide
10 means for holding a supply of fastening clips in readiness for coacting with the clip-feeding means.

Another object is to provide means for causing the clip-feeding means to function
15 while the band is being placed under tension.

Another object is to provide means to form several crimps in rapid succession in both the clip and the ends of the band.

Another object is to provide an improved
20 seal.

Still other objects and advantages of the invention will be apparent upon a full understanding of the machine and of the seal produced with the same.

25 One structural form of the invention is presented herein for the purpose of exemplifications, but it will of course be appreciated that the invention is susceptible of embodiment in other structurally modified forms coming equally within the scope of the claims.
30

In the drawings:

Fig. 1 is a front view of a machine embodying the several features of the invention, showing a band in the machine before the
35 tensioning and sealing operations;

Fig. 2 is a plan view of the machine;

Fig. 3 is another front view of the machine, showing the same after the tensioning
40 operation but before the sealing operation;

Fig. 4 is another front view of the machine, showing the same after the tensioning and sealing operations;

45 Fig. 5 is a plan view of the machine, with the casing and certain other parts removed;

Fig. 6 is an end view of the machine;

Fig. 7 is a vertical section through the machine taken substantially on the line 7—7 of Fig. 2;

Fig. 8 is a perspective view of the magazine for holding the sealing clips; 50

Fig. 9 is a perspective view of the seal produced by the machine; and

Fig. 10 is a perspective view of one of the clips used by the machine in producing the
55 seal.

The machine illustrated in the drawings, in being used to fasten a band around a box, is placed upon the box at the place where the band is desired. One end of the band is secured in the machine, and the other end of the band, after being passed around the box, is also secured in the machine. The machine is then operated by moving two hand levers, one after the other. Movement of
60 the first lever results in the overlapped ends of the band being drawn taut about the box under a predetermined amount of tension, and in a sealing clip being automatically fed into proper position with relation to the ends of the band; while movement of the second lever results in the clip and the overlapped
65 ends of the band embraced by the same being deformed to produce a seal, and in one of the ends of the band being automatically cut off beyond the seal. 70 75

The clip used is a flat rectangular member 11 of U-shaped cross section. The top and bottom portions 11a and 11b of the clip, which are parallel to each other and are connected together along one side 11c only, are of substantially the same width as the overlapped ends of the band between the same. 80

It will be observed in the drawings that the machine includes a lip 12 over which one end of the band is hooked; a dog 13 under which the other end of the band is gripped; a hand lever 14 for moving the dog 13 in a direction away from the lip 12 whereby to tension the band about the box; 85 90

a magazine 15 for holding a supply of sealing clips; an ejector 16 for automatically feeding the clips one at a time into proper position with relation to the overlapped ends of the band during the movement of the dog 13 in tensioning the band; a stationary die 17 across which the overlapped portions of the band extend and onto which the clip is fed; a rolling die 18 above and to one side of the die 17; a hand lever 19 for rolling the die 18 over the die 17 whereby to deform the clip and the ends of the band embraced between the top and bottom portions of the same; a plate 20 for holding the box-encircling portion of the band separated from one of the ends of the same; and a cutter 21 for automatically shearing off that end of the band against the plate 20 after the die 18 has operated, which cutter is automatically moved into an elevated position by the dog 13 after the shearing operation whereby to facilitate insertion of another band in the machine.

The parts described are mounted on a flat elongated base 22, and the lip 12, the die 17 and the plate 20 project from the front side of base. The dog 13 is pivoted at 23 to a block 24, and a serrated surface 25 on the dog grips one end of the band by being pressed toward a serrated surface 26 on the block by a spring 27. The dog is provided with a handle 28 for swinging the surface 25 on the dog away from the surface 26 on the block when the end of the band is being inserted or removed.

The block 24 shifts along a guide rail 29 which projects from one end of the base, and the front and rear edges of the block are dovetailed over the corresponding edges of the rail. The block 24 is shifted by the hand lever 14, the lever being pivoted at 30 to a casing 31 on the base and having formed on the pivoted end thereof a toothed segment 32 which is meshed through an opening in the casing with a toothed rack 33 formed on a bar 34 to which the block is connected. The block, instead of being fixedly secured to the bar, is provided with a pin 35 which extends through an elongated slot 36 in the bar and bears against one end of a coil spring 37.

When the bar 34 is shifted toward the right by the lever 14 to move the block and dog along the rail and tension the band, the block and dog will only move as long as the tension on the band is less than the resistance of the spring 37 to compression. As soon as the tension on the band equals such resistance, the block and dog will stop moving and remain stationary during the completion of the movement of the lever. The resistance of the spring obviously determines the amount of tension placed on the band, and such tension may be easily changed to any amount desired by substituting for the spring 37 a similar spring of greater or less resistance.

The magazine 15 is a tube of rectangular cross section which faces the die 17 and extends upwardly from the base 22 through the casing 31. The clips 11 are arranged in a stack in the magazine, with the open sides of the clips toward the die 17, and the front and rear walls of the magazine are cut away at the bottom to the height of one clip to permit the ejector 16 to move through such openings and shift the lowermost clip from the magazine into a position on the die 17 where the top portion of the clip will be above the overlapped ends of the band and the bottom portion of the clip will be below the same, in readiness for the sealing operation. The ejector pushes the clip a little farther than necessary, in order to displace the overlapped ends of the band slightly and thereby insure a close connection between the clip and the ends.

The magazine 15 is closed at the top, and contains a spring-pressed follower 38 which acts against the uppermost clip in the stack. The magazine is deeper than the width of the clips require and the extra space in the back of the same is occupied by a filler block 39. When it is desired to fasten bands of greater width than that shown in the drawings, a thinner filler block is substituted, permitting the use of wider clips. To refill the magazine, the same is withdrawn from the machine and inverted, whereupon a stack of the clips may be forced into the magazine against the resistance of the follower. While the magazine is being replaced in the machine, the clips may be prevented from leaving the magazine by the application of side pressure to the clips through an observation slot 40 in the front wall of the magazine.

The ejector 16 operates automatically to feed a clip while the lever 14 is being moved, the bar 34 which takes part in the tensioning operation having a plate 41 on the bottom thereof which is diagonally slotted for camming engagement with a pin 42 on the top of the ejector.

The stationary die 17 is provided with a number of transverse corrugations 43 arranged in substantially the same plane, and the rolling die 18 is provided with a number of similar corrugations 44 which are arranged in an arc about a point at the center of two oppositely extending trunnions 45 on the die 18. When the handle 19 which rolls the die 18 is in the position shown in Fig. 1, the die 18 is separated from the die 17 in a position above and to one side of the latter, the separation being effected by means of a number of teeth 46 on the rear portion of the die 18 opposite a relieved surface 47 on the front portion of that die, which teeth mesh with corresponding teeth 48 on the rear portion of the die 17. The meshing of the teeth 46

and 48 not only separates the dies, but insures proper registration of the corrugations 43 and 44 when the die 18 is rolled over the die 17. As the die 18 is rolled, the trunnions 45 ride along thrust surfaces 49 and 50 on the casing 31, and the corrugations 44 are brought one at a time into the grooves between the corrugations 43, with the result that the compression exertable with the machine in crimping the clip and overlapper ends of the band is applied separately to each of the crimps in the seal in turn rather than distributed over all of the same.

The cutter 21 is automatically caused to operate as the die 18 reaches the end of its seal-forming movement, a shoulder 51 on the lever 19 adjacent the die 18 moving into engagement with the nose of the cutter and swinging the same downwardly across the edge of the plate 20 about a pivot 52. The end of the band overlying the plate 20 and held by the dog 13 is consequently sheared off. The shape of the nose of the cutter is such as to tend to bend the cut end downwardly close to the seal. When the lever 14 is moved to the right in readiness for the next band-fastening operation, the nose of the cutter is automatically elevated above the plate 20 to facilitate the positioning of another band in the machine, the pivoted end of the cutter being provided for this purpose with a projection 53 which is cammed downwardly by a surface 54 on the dog 13 when the latter returns to its initial position. At the same time, and as a result of such camming action, the dog 13 is tilted to separate the surfaces 25 and 26.

The seal illustrated in Fig. 9 is but one of many effective formations which the machine is capable of producing. To change from one formation to another, it is merely necessary to substitute for the dies 17 and 18 two other dies having the desired surface contours.

I claim:

1. In a band-fastening machine, means for holding the ends of a flat band in overlapped relation, means for feeding a U-shaped sealing clip into a position about three sides of the overlapped ends, and means for deforming the parallel portions of the clip and ends in such a way as to seal the same.

2. In a band-fastening machine, means for holding the ends of a flat band in overlapped horizontal relation, means for tensioning the overlapped portions of the ends, means for moving a U-shaped sealing clip horizontally into a position about three sides of the overlapped portions of the ends, and separate means for deforming the parallel portions of the clip and ends in such a way as to seal the same.

3. In a band-fastening machine, means for holding the ends of a band, means for tensioning the ends, means functioning auto-

matically upon operation of the tensioning means for feeding a sealing clip to the ends, and means for deforming the clip and ends in such a way as to seal the same.

4. In a band-fastening machine, means for holding the ends of a band, a hand lever operable both to tension the ends and to feed a sealing clip to the same, and another hand lever operable to deform the clip and ends in such a way as to seal the same.

5. In a band-fastening machine, means for holding the ends of a flat band in overlapped relation, means for moving a three-sided sealing clip into a position about three sides of the overlapped portions of the ends, means for deforming the clip and ends to produce a seal, and means functioning automatically upon operation of the deforming means for cutting off one of the ends beyond the seal.

6. In a band-fastening machine, means for holding the ends of a band, means for tensioning the overlapped portions of the ends, means for feeding a sealing clip to the ends, and a hand lever operable both to deform the clip and ends to produce a seal and to cut off one of the ends beyond the seal.

7. In a band-fastening machine, means for holding the ends of a band, means for tensioning the ends, means for feeding a clip to the ends while the tensioning is in progress, and means for deforming the clip and ends when fully tensioned.

8. In a band-fastening machine, a flat stationary die having recesses therein, a guide on the machine in spaced parallel relation to the flat die, a curved rolling die having projections thereon cooperating with the recesses in the stationary die in such a way as to progressively deform banding material placed therebetween and a trunnion on the curved die for sliding engagement with the guide.

9. In a band-fastening machine, a substantially flat stationary die having transverse grooves therein, a curved rolling die having transverse ribs thereon for complementary cooperation with the grooves in the stationary die in such a way as to progressively deform banding material placed therebetween, and means at one side of the operative surfaces of the dies for maintaining the grooves and ribs in register.

10. In a band-fastening machine, means for tensioning a band about an object, means for positioning a sealing clip on the band in such a way as to displace the latter slightly in one direction and insure a close connection between the clip and band, and means for compressing the clip on the band in a different direction substantially at right angles to the direction of displacement.

11. In a band-fastening machine, means for holding the ends of a flat band in a horizontal position with the portion of the band inter-

mediate the ends looped about an object, a vertical magazine at one side of the plane of the loop formed by the band adapted to contain a supply of U-shaped sealing clips, means for moving the sealing clips laterally one at a time from the bottom of the magazine into a position about three sides of the ends, and means located and operating in the plane of the loop formed by the band for deforming the clip and ends in such a way as to seal the same.

12. In a band-fastening machine, means for holding the ends of a band in overlapped relation, means for applying tension to the overlapped portions of the ends, means for feeding a generally U-shaped fastening member into embracing relation with the portions of the ends under tension, and means for deforming the member and ends to produce a seal.

13. In a band-fastening machine, means for holding the ends of a band in overlapped relation, means for placing the overlapped portions of the ends under tension, means for feeding a generally U-shaped clip into embracing relation with the tensioned portions of the ends, means for deforming the clip and ends to produce a seal, and means functioning automatically upon operation of the deforming means to cut off one of the ends beyond the seal.

14. In a band-fastening machine, means for holding the ends of a band in overlapped relation one upon the other, means for applying tension to the overlapped portions of the ends, means for moving in the plane of tension an embracing clip about the tensioned portions of the overlapped ends, means for fastening the clip and such portions together to produce a seal, and means for cutting off one of the ends between the seal and the tensioning means.

15. In a machine for fastening a substantially flat sheet metal band about an object, means for placing the band under tension with portions thereof overlapped, a magazine for holding a supply of generally U-shaped sheet metal seals which are of sufficient size to substantially encase the overlapped portions of the band when applied thereto, means for removing one of the seals from the magazine and advancing it open side foremost into a position about certain of the sides of the overlapped portions of the band, and means for deforming both the seal and the band portions enclosed within the same, whereby to produce an interlock therebetween.

16. In a machine for fastening a substantially flat sheet metal band about an object, means for placing the band under tension with portions thereof overlapped, a magazine for holding a supply of generally U-shaped sheet metal seals which are of sufficient size to substantially encase the overlapped portions of the band when applied thereto, means for removing one of the seals from the magazine and placing it with a substantially flat portion thereof underlying the overlapped portions of the band, and means for deforming both the seal and the band portions enclosed within the same, whereby to produce an interlock therebetween.

tions of the band when applied thereto, means for removing one of the seals from the magazine and placing it with a substantially flat portion thereof underlying the overlapped portions of the band, and means for deforming both the seal and the band portions enclosed within the same, whereby to produce an interlock therebetween.

17. In a machine for fastening a substantially flat sheet metal band about an object, means for placing the band under tension with portions thereof overlapped, a magazine for holding a supply of generally U-shaped sheet metal seals which are of sufficient size to substantially encase the overlapped portions of the band when applied thereto, means for removing one of the seals from the magazine and placing it with a substantially flat portion thereof underlying the overlapped portions of the band, and means for deforming both the seal and the band portions enclosed within the same, whereby to produce an interlock therebetween.

18. In a machine for fastening a band about an object, means for placing the band under tension with portions thereof overlapped, a stationary magazine for holding a supply of generally U-shaped sheet metal seals, a spring-pressed follower for urging the seals toward one end of the magazine, a movable ejector engageable with the back of one of the seals for removing such seal from that end of the magazine and placing it in proper position with respect to the overlapped portions of the band, and means for deforming both the seal and the band portions engaged by the seal, whereby to produce an interlock therebetween.

19. In a machine for fastening together overlapped portions of a sheet metal band, a magazine for holding a supply of generally U-shaped sheet metal seals which are of sufficient size to substantially encase the overlapped portions of the band when applied thereto, means for removing one of the seals from the magazine and advancing it open side foremost into a position about certain of the sides of the overlapped portions of the band, and means for deforming both the seal and the band portions enclosed within the same, whereby to produce an interlock therebetween.

20. In a machine for fastening together overlapped portions of a sheet metal band, a magazine for holding a supply of generally U-shaped sheet metal seals which are of sufficient size to substantially encase the overlapped portions of the band when applied thereto, means for removing one of the seals from the magazine and placing it with a substantially flat portion thereof underlying the overlapped portions of the band, and means for deforming both the seal and the band portions enclosed within the same, whereby to produce an interlock therebetween.

portions enclosed within the same, whereby to produce an interlock therebetween.

21. In a machine for fastening together overlapped portions of a sheet metal band, a magazine for holding a supply of generally U-shaped sheet metal seals which are of sufficient size to substantially encase the overlapped portions of the band when applied thereto, means for removing one of the seals from the magazine and placing it with a substantially flat portion thereof overlying the overlapped portions of the band, and means for deforming both the seal and the band portions enclosed within the same, whereby to produce an interlock therebetween.

In testimony whereof I have hereunto subscribed my name.

PARVIN WRIGHT.

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