Sept. 29, 1953 E. R. WORKMAN 2,653,362

CLIP AND METHOD FOR APPLYING IT

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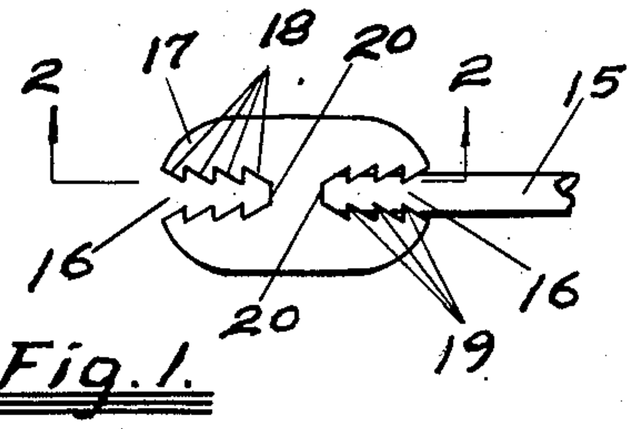


Fig. 1.

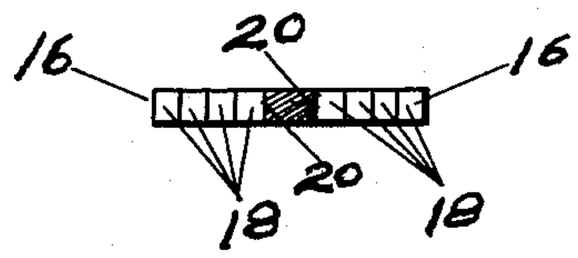


Fig. 2.

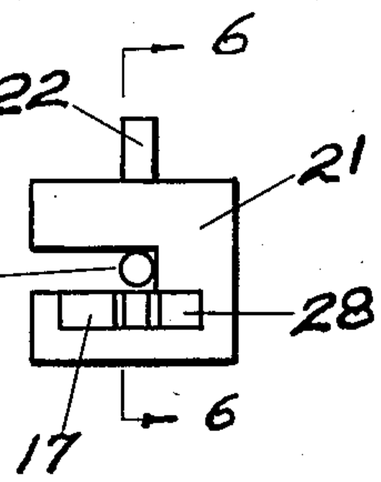


Fig. 4.

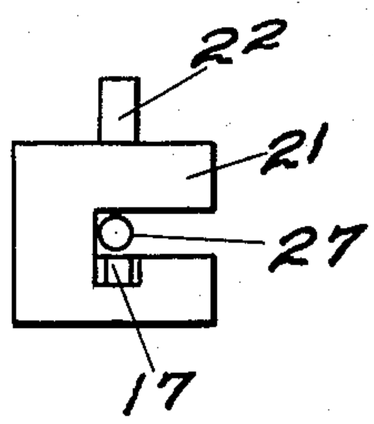


Fig. 5.

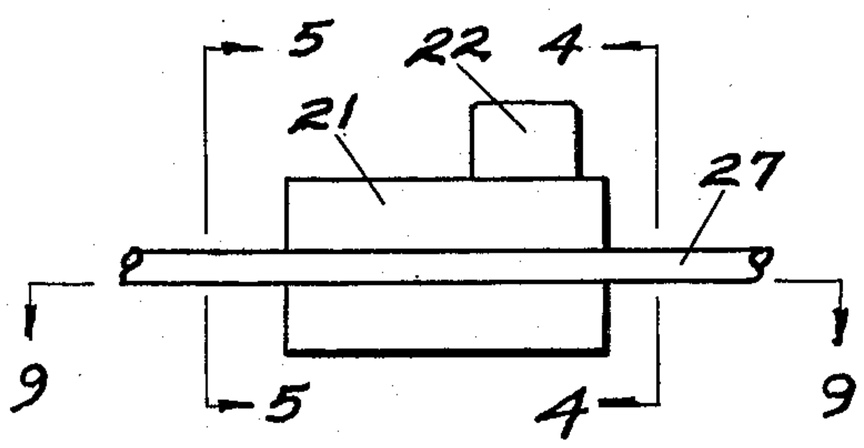
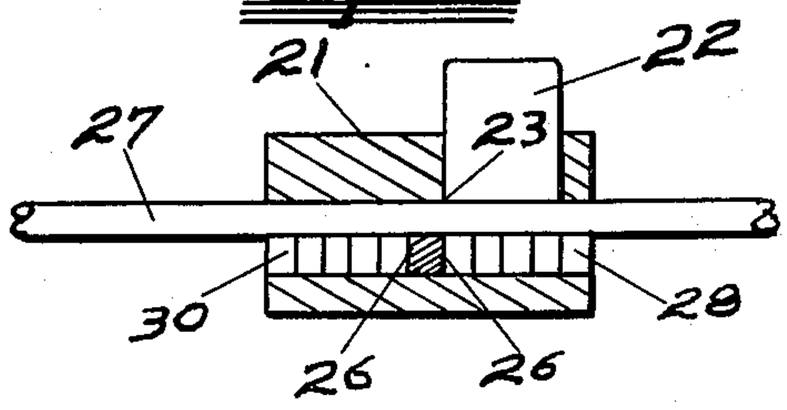


Fig. 3.

Fig. 6.



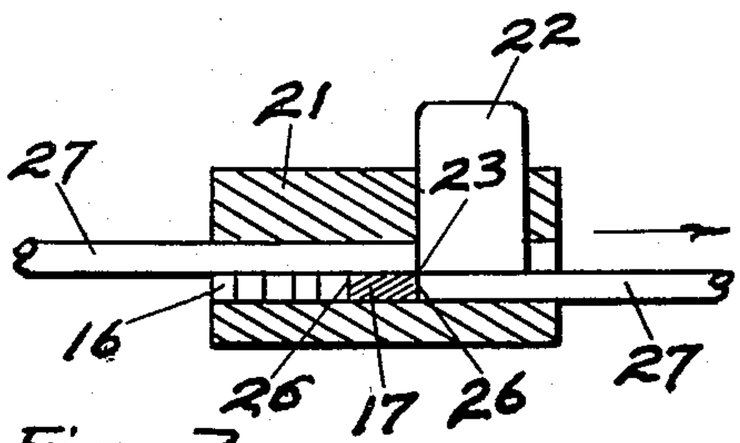


Fig. 7.

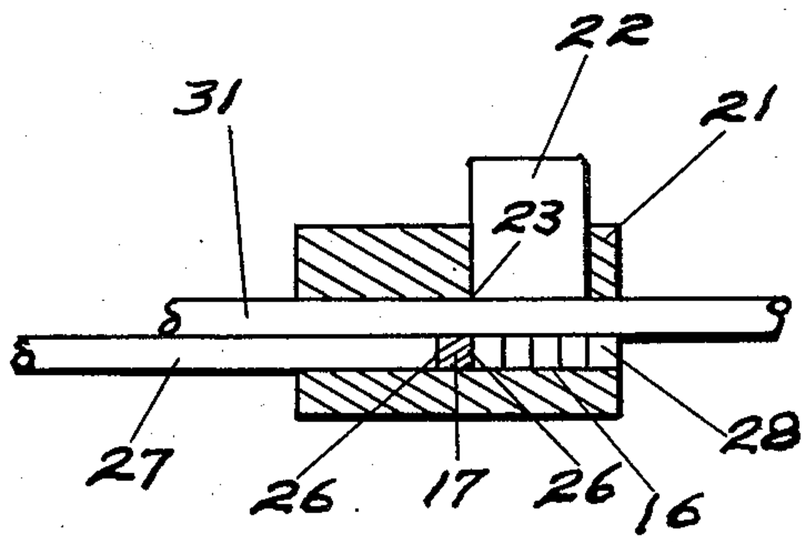


Fig. 8.

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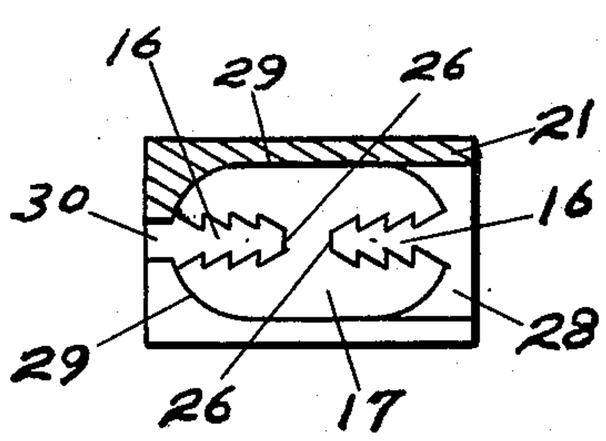

Fig. 9.

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CLIP AND METHOD FOR APPLYING IT

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4 Claims. (Cl. 24—22)

1

This invention relates to clips for securing flexible ties around bales, packages and the like.

In prior forms of clips with which I am aware, it is necessary to deform both the clip and the flexible tie to such an extent that the physical strength of the tie is greatly reduced at the point where it is deformed. This is of obvious disadvantage in that the tie may be readily caused to be broken at the weakened points thereof in the bale or the package thus secured. Further, in such known forms of clips considerable force is necessary to deform both the clip and the tie to the extent required for securing a bale or package so that undue fatigue is experienced by the operator during extended periods of applying such clips.

It is an object of my invention to provide a clip of simple construction and which is not subject to the above noted and other disadvantages of previously known forms of clips of this character.

An important feature of my clip resides in the provision of an opening extending inwardly of a surface thereof, of less than the width of the flexible tie, and in which the opening is defined in part by a shearing edge so that when a portion of a tie is caused to be pressed or driven into the opening the shearing edge will sever the tie from the source of supply tie material.

A further preferred feature resides in providing a clip in which the aforementioned opening is further defined by a suitably shaped edge portion which will firmly grip the side edges of the tie by only slight deformation of the latter so that the tie cannot be removed from the clip by tension exerted on the tie in a direction for withdrawing it from the opening in the clip.

A further object of my invention is to provide a clip of the character indicated in which ties may be secured about a bale or package in diverging or crossing relation with respect to each other.

The above and other objects and features of my invention will appear from the detailed description.

Now in order to acquaint those skilled in the art with a manner in constructing and utilizing clips in accordance with the principles of my present invention, I shall describe in connection with the accompanying drawing certain preferred embodiments of my invention.

In the drawing:

Figure 1 is a plan view of a clip constructed in accordance with my invention and showing a flexible tie secured at one end in the clip;

2

Figure 2 is a vertical sectional view of the clip shown in Figure 1, taken substantially on line 2—2 looking in the direction indicated by the arrows;

Figure 3 is a side elevational view of a device for securing the end of a tie in the clip of Figure 1;

Figure 4 is a right hand end view of the device of Figure 3 taken along the line 4—4 of Figure 3 looking in the direction indicated by the arrows;

Figure 5 is a left hand end view of the device of Figure 3 taken substantially along the line 3—3 of the latter figure looking in the direction indicated by the arrows;

Figure 6 is a vertical sectional view taken substantially on a line 6—6 of Figure 4 looking in the direction indicated by the arrows;

Figure 7 is a view similar to Figure 6 and showing one end of a tie secured in the clip;

Figure 8 is a vertical sectional view along the lines of Figures 6 and 7 and illustrating the manner in which the opposite end of the tie is secured in the other end of the clip; and

Figure 9 is a horizontal sectional view taken substantially on a line 9—9 of Figure 3 looking in the direction indicated by the arrows and showing the manner in which the clip of Figure 1 is adapted to be supported in the attaching device.

Referring now particularly to Figure 1 of the drawing, I have shown a clip 17 embodying my invention which, it will be observed, is provided with openings 16 extending inwardly one from opposite ends of the clip. The clip 17 is preferably made of metal and it will be seen that the openings 16 are defined by opposed side walls or surfaces of serrated or toothed form. The openings 16 are further defined by end walls 20 extending transversely of the clip and between the side walls 18 thereof. The clip 17 is preferably formed of suitable metal so that the edges of the serrations 18 and the end wall 20 at the top and bottom surfaces of the clip are capable of shearing the portion of tie such as shown at 15 which is to be secured in the clip. The tie 15 may be formed of metal, plastic or other rigid material either of circular cross section or flat band as may be desired. The material of which the tie is made preferably is of a character whereby it may be sheared by the defining edges of the opening 16 of the clip, so that when the tie is secured at one end in an opening 16 of the clip its contour conforms substantially to that defined by the serrated side walls 18 and the

end edge 20 as indicated generally at 19 in Figure 1.

In tying a package or bale with a flexible tie it will be observed that one end portion of the tie may be disposed in alignment with and above one opening 16 of the clip, and upon forcing of the end of the tie into the opening it is caused to be sheared in the manner above noted so as to secure that end of the tie in the clip. The flexible tie may then be wrapped around the package or bale by drawing of the material from the supply source with the material extending from the supply source being then disposed above the other opening 16 at the other end of the clip and upon pressing inwardly of the tie into the opening 16 it is caused to be severed from the supply by the end shearing edge 20 thereof, and the side edges of the tie sheared as by the serrated shearing side edges of such opening to secure firmly the tie about the package or bale.

In the preferred form of clip of my invention the width of the opening 16 as determined by the inwardly projecting teeth of the side walls 18 is preferably slightly less than the width of the tie 15 so that the portions of the tie forced into openings 16 are firmly embedded in the serrations and to an extent so that tie cannot be readily removed by tension exerted endwise on the tie away from the clip.

It will be observed from the above description of the clip of my invention that the clip is not caused to be deformed in securing the tie therein, but rather embodies suitable shearing edges serving to shear or embed themselves into the adjacent portions of the tie material, and with the end shearing edges 20 serving to shear the supply tie material from the supply in wrapping a package or bale with the tie and in securing with the ends thereof in position.

In Figures 3 through 9 I have shown a device providing for the convenient support of a clip 17 as above described in relation to a package or bale to be wrapped for securing the opposite ends of a band of tie material around the package or bale. The device shown in the figures last referred to comprises a body member 21 within which a plunger 22 is suitably mounted for a vertical reciprocatory movement. The plunger 22 as shown in Figure 7 is provided with a shearing edge 23 which is adapted to be disposed in vertical alignment with either of the end shearing edges 26 at the inner ends of the openings 16 of the clip. The body portion 21 of the device is preferably recessed as indicated at 23 in Figure 9 for receiving the clip and includes a shoulder 29 at one end for supporting a clip in the position last described in which a shearing 26 thereof is in alignment with the shearing edge 23 of the plunger 22. The recess 29 preferably opens outwardly of the other end of the body member 21 so that clip 17 may be readily inserted and withdrawn from the attaching device and so that either end of the clip may be abutted with shoulder 29 so that either shearing end edge 26 of the end openings may be aligned as described with the plunger 22. As shown an opening 30 for the tie material extends outwardly of the attaching device at shoulder 29.

Referring more particularly to Figure 6 the device is there shown as having a clip 17 of the construction above described, disposed therein. The body member 21 is formed with a lengthwise opening or slot extending laterally inwardly of one side thereof and above recess 29 so that the tie material 27 may be extended in a lengthwise direction through the body member, above openings 16 in the clip and below plunger 22. The plunger 22 may then be forced vertically downwardly to the position shown in the Figure 7 from which it will be observed that the shearing edge 23 of the plunger and the shearing end edge 26 of the opening 16 of the clip 17 shear the tie material and the plunger 22 disposes an end portion of the tie material in the opening 16. Thus, one end of the tie material may be caused to be secured in one end opening 16 of the clip.

The clip with one end of the tie attached thereto may be removed and the clip arranged so that its other opening 16 is aligned with plunger 22 as shown in Figure 8. The tie 27 may be formed into an encircling loop around a bale or package and the lead 31 of the tie material from the source of supply is then arranged with respect to the clip and the attaching device as shown in the last referred to figure. Upon downward vertical movement of the plunger 22 the tie 31 extending from the supply of the material is severed and the end portion embedded in the other opening 16 of the clip 17. The two ends of the encircling loop are thus caused to be firmly secured in the openings 16 of the clip. The attaching device may then be removed from the connected loop and the sheared end portion 31 of the supply of the tie material may be removed by pulling it out endwise from the device through opening 30. In order to remove the device from the connected clip, the device is shifted to the left of the position shown in the Figure 8 to slide the connected clip out of the recess 29 formed in the body member 21 thereof, and then raising the loop so that it may be aligned with the longitudinally and laterally outwardly opening 28 of the attaching device. The loop and attaching device may then be shifted laterally relative to each other to remove the attaching device from the circling loop disposed about the package.

While I have shown a preferred form of clip and attaching device embodying my present invention it will be understood that various modifications may be made therein without departing from the spirit and scope of my invention,

I claim:

1. A clip for securing an end of tie material, comprising, a plate member having an opening extending inwardly from its edge, a side wall of the opening having projections extending into the opening, and an intersection of the end wall of the opening and a surface of the plate forming an edge for shearing tie material, the width of said opening at the bottoms of the projections being proportioned with respect to the structure of the tie material to permit enforcement of the tie material laterally into the opening, and the width of said opening at the tops of the projections being proportioned with respect to the structure of the tie material to securely embed said tops of the projections into the enforced tie material.

2. A clip for securing the ends of tie material, comprising, a plate member having at least two openings extending inwardly from its edge, a side wall of each opening having projections extending into their respective openings, an intersection of an end wall of an opening and a surface of the plate forming an edge for shearing tie material, and a partition portion of the plate disposed between the openings, and bounded by said end walls the width of the openings at the bottoms of the projections being proportioned

with respect to the structure of said tie material to permit enforcement of the tie material laterally into the openings, and the width of said openings at the tops of the projections being proportioned with respect to the structure of the tie material to securely embed said tops of the projections into the enforced tie material.

3. The method of securing an end of tie material to a clip, the clip comprising a plate member having an opening extending inwardly from its edge, a side wall of the opening having projections extending into the opening, and an intersection of the end wall of the opening and a surface of the plate forming an edge for shearing tie material, the width of the opening at the bottoms of the projections being proportioned with respect to the structure of the tie material to permit enforcement of the tie material laterally into the opening, and the width of the opening at the tops of the projections being proportioned with respect to the structure of the tie material to securely embed said tops of the projections into the enforced tie material, said method including the steps of, positioning tie material over the opening and in overlapping relation with said shearing edge, and of forcing the portion of tie material covering the opening into the opening thereby shearing the positioned tie material on said shearing edge and embedding the forced portion of tie material on the tops of said projections within the opening.

4. The method of securing an end of tie material to a clip, the clip comprising a plate member having an opening extending inwardly from its edge, the opening having a transversely related end wall, a side wall of the opening having

projections extending into the opening, the width of the opening at the bottoms of the projections being proportioned with respect to the structure of the tie material to permit enforcement of the tie material laterally into the opening, and the width of the opening at the tops of the projections being proportioned with respect to the structure of the tie material to securely embed said tops of the projections into the enforced tie material, said method including the steps of, positioning an end of tie material over the opening with its end surface in comparative registering alignment with the end wall of said opening, and of forcing the positioned portion of tie material covering the opening into the opening thereby embedding the forced portion of tie material within the opening on the tops of said projections.

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