Oct. 12, 1965 M. J. G. TIPPER 3,210,835

APPARATUS FOR FASTENING CASINGS AND THE LIKE

Filed May 14, 1964 3 Sheets-Sheet 1

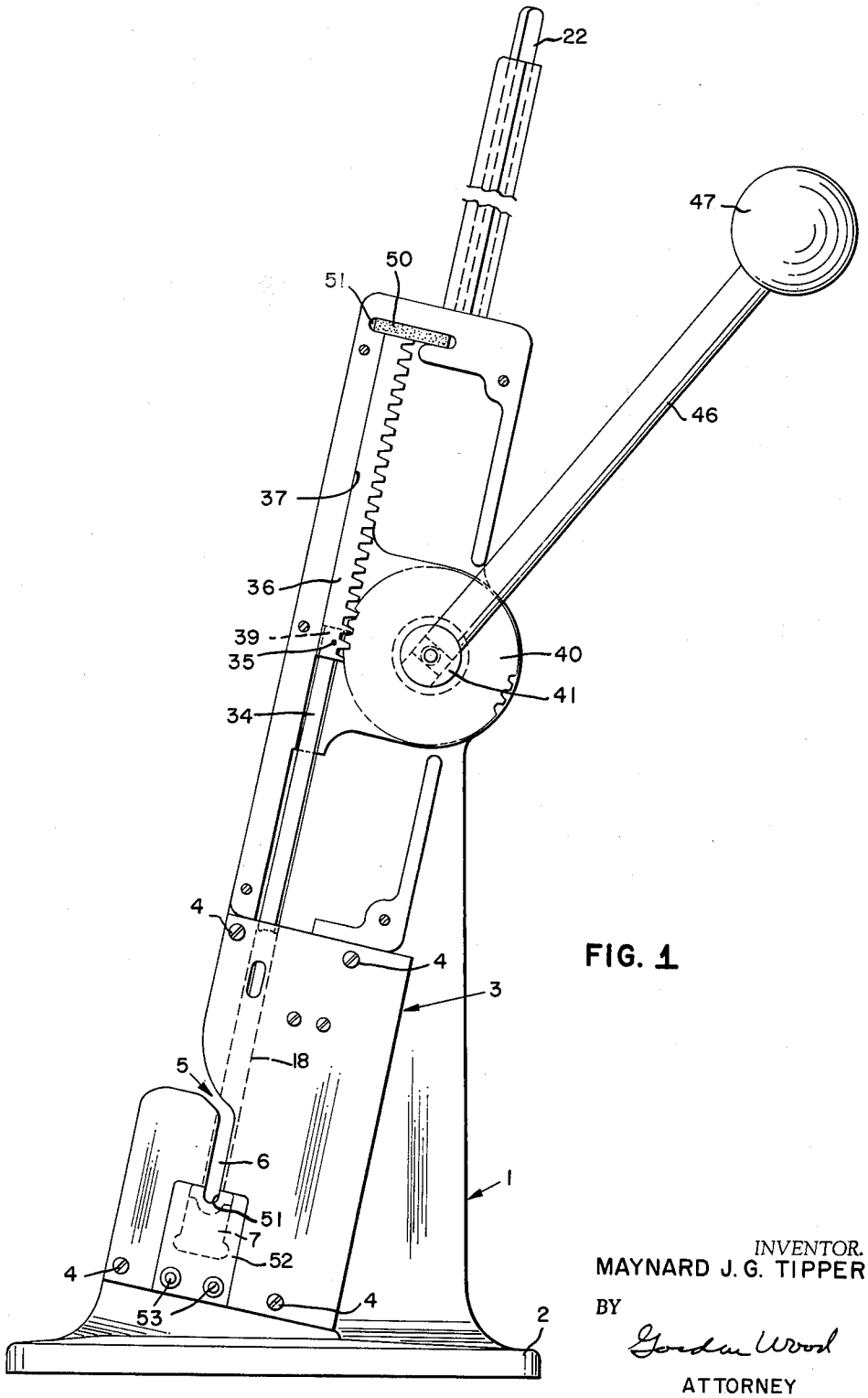


FIG. 1

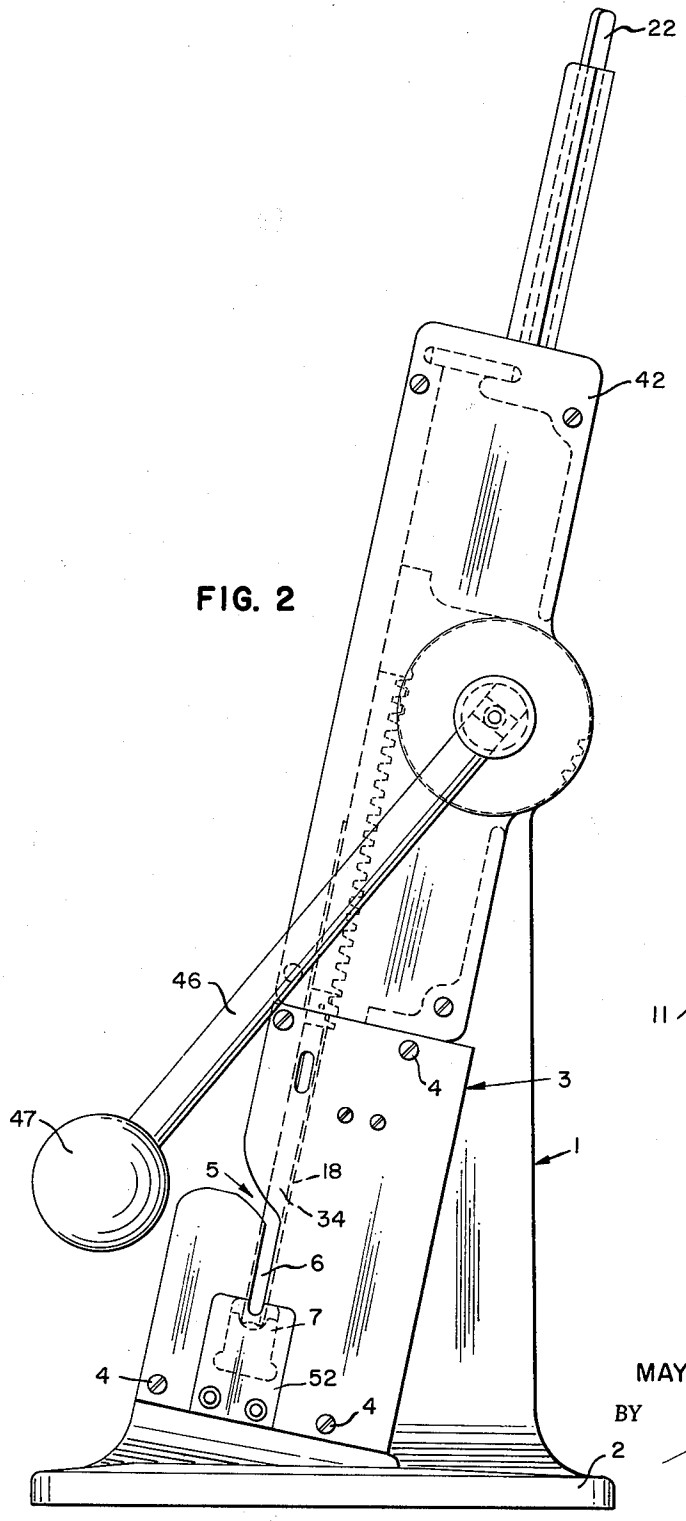
INVENTOR.
MAYNARD J. G. TIPPER
BY
Gordon Wood
ATTORNEY

Oct. 12, 1965 M. J. G. TIPPER 3,210,835

APPARATUS FOR FASTENING CASINGS AND THE LIKE

Filed May 14, 1964 3 Sheets-Sheet 2

FIG. 2



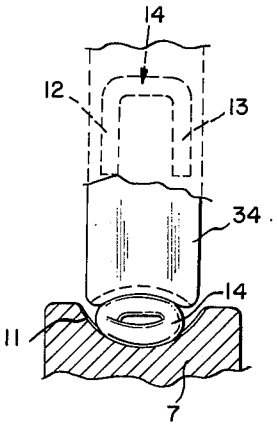


FIG. 7

INVENTOR.
MAYNARD J. G. TIPPER

BY Gordon Wood

ATTORNEY

Oct. 12, 1965 M. J. G. TIPPER 3,210,835

APPARATUS FOR FASTENING CASINGS AND THE LIKE

Filed May 14, 1964 3 Sheets-Sheet 3

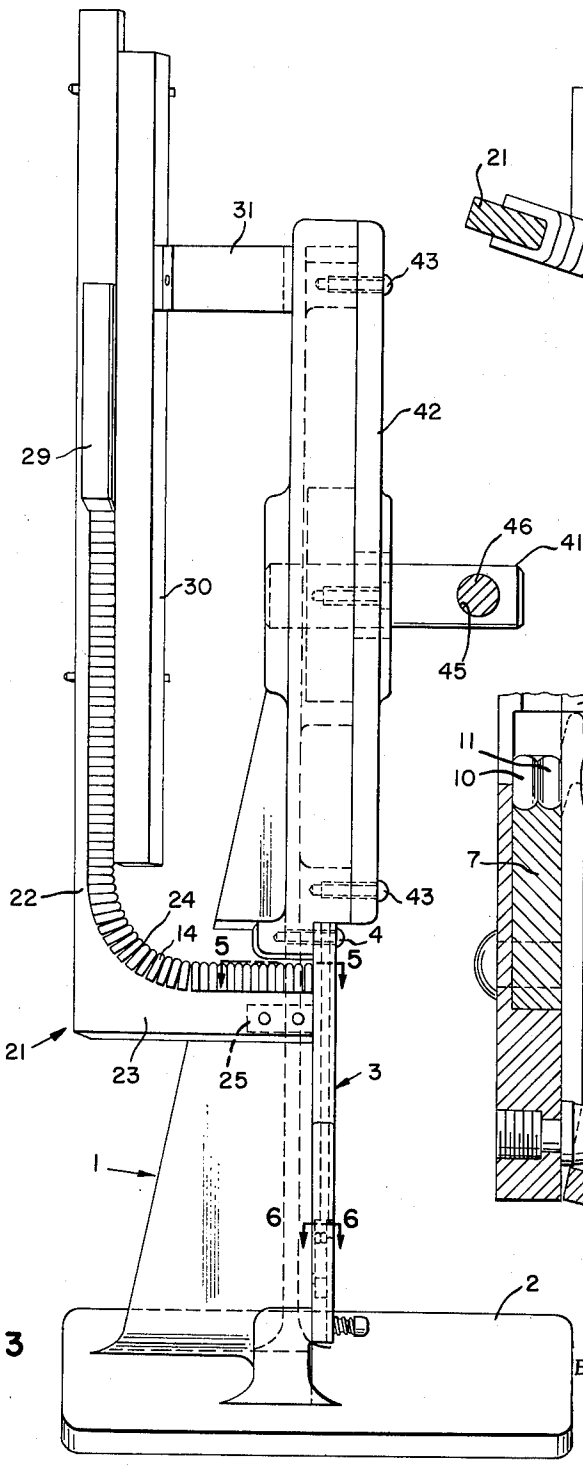


FIG. 3

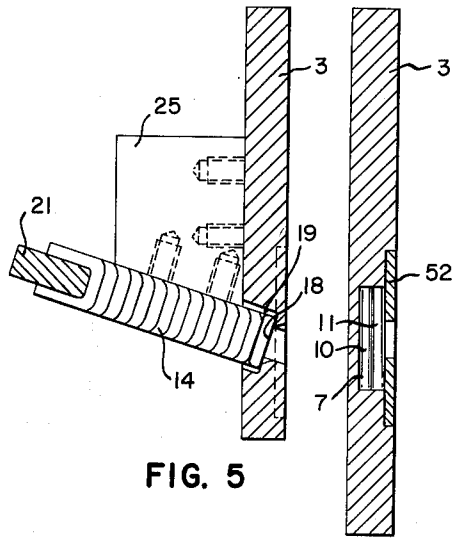


FIG. 5

FIG. 6

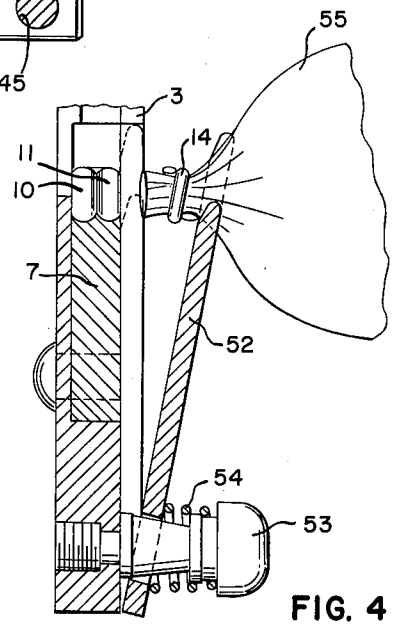


FIG. 4

INVENTOR.
MAYNARD J. G. TIPPER
BY
Gordon Wood.
ATTORNEY

United States Patent Office 3,210,835 Patented Oct. 12, 1965

3,210,835
APPARATUS FOR FASTENING CASINGS AND THE LIKE

Maynard J. G. Tipper, Oakland, Calif., assignor to Rheem Manufacturing Company, New York, N.Y., a corporation of California

Filed May 14, 1964, Ser. No. 367,536
4 Claims. (Cl. 29—243.57)

This invention relates to an apparatus for applying a permanent fastener around an article and is particularly adapted for applying a pronged metal clip to the end of a flexible or deformable casing or bag enclosing a product such as foodstuff.

In some respects the present invention is similar to that disclosed in my copending application Serial No. 262,761 filed March 4, 1963 and is concerned with the same type of operation as is disclosed in my prior Patents No. 2,879,512 issued March 31, 1959 and No. 2,880,419 issued April 7, 1959.

The present invention is adapted to be employed with a generally U-shaped heavy duty pronged clip or staple the legs of which are adapted to be bent toward each other and around the article to be fastened.

One of the objects of the present invention is the provision of an apparatus that will wrap a generally U-shaped fastener around an article such as a casing end to give a strong and tight bind on such article without the use of an undue amount of power.

Another object of the invention is the provision of a relatively simple apparatus that lends itself to manual operation for performing the function of applying a staple around an article such as a casing end.

Yet another object of the invention is the provision of an effective means for applying a fastener to an article without the use of power and which means may be readily operated by a person without the expenditure of a great amount of effort.

Still another object of the invention is the provision of a manually operated clipper of the type herein described which ensures that the necessary amount of power is applied to the clip in order to effect optimum securement.

Other objects and advantages will be apparent from the following specification and from the drawings.

FIG. 1 is a side elevation of the invention with the cover plate removed and with the device in "at rest" position.

FIG. 2 is a side elevation similar to FIG. 1 but with the punch in operative engagement with the die.

FIG. 3 is an end elevation.

FIG. 4 is a greatly enlarged vertical section through the die and die support showing guide plate swung outwardly by a fastened casing end.

FIG. 5 is a horizontal cross section through the standard taken in a plane indicated by lines 5—5 of FIG. 3.

FIG. 6 is a horizontal cross section through the standard taken in a plane indicated by lines 6—6 of FIG. 3.

FIG. 7 is a greatly enlarged vertical section through the die showing the staple in its deformed shape.

In detail, and first with reference to FIGS. 1, 2 and 3, the invention comprises a generally upwardly extending standard generally designated 1 that includes a base 2 adapted to be supported on a bench, table or the like. Adjacent the base 2 the standard 1 is provided with a die support generally designated 3 which may be secured by means of machine screws 4 to the standard 1. The die support 3 is formed with a throat 5 through which the article to be stapled such as a casing end may be inserted into a vertically extending passageway 6. At the lower end of passageway 6 a die 7 is provided; said die 7

being secured within a complementarily formed recess in the die support 3 and secured in place by means of screws (not shown).

Die 7 is provided with a pair of upwardly opening arcuate grooves 10, 11 (FIG. 4). Grooves 10, 11 are adapted to receive the legs 12, 13 (FIG. 7) of the U-shaped staple 14 which is employed with the instant device. As best seen in FIG. 7, the staple 14 is ultimately deformed to the shape shown with the legs of the staple 14 bent past each other to provide a closed loop encircling the article to be secured.

The die support 3 is formed to provide a vertically extending track 18 which extends from its lower end adjacent the upper side of die 7 upwardly through the top of the die support 3. Said track 18 is formed generally complementarily to the staples 14 so that the latter may be fed one at the time downwardly through track 18 into engagement with die 7.

Adjacent the upper end of die support 3 the same is provided with an outwardly opening recess 19 (FIG. 5) communicating with track 18 and through which recess the staples 14 are adapted to be fed into said track.

The staples 14 are provided in the form of sticks which include a plurality of staples flexibly adhered together by paper or any other suitable means and said sticks of staples are supported on a rail 21 that includes a vertically extending portion 22 and a horizontally extending portion 23 (FIG. 3) with said vertical and horizontal portions being connected by a smooth arcuate juncture 24 at which the direction of feed of the staples changes from vertically downwardly to horizontally inwardly relative to the device. The rail 21 is secured at its lower end to a block 25 which in turn is secured to the die support 3. It will be noted that the vertical plane of the rail 21 is at an angle to the vertical plane of the die support 3 as best seen in FIG. 5 so that the staples 14 remain angularly disposed relative to the plane of die support 3, and it will further be noted that the plane of the track 18 is similarly angularly disposed relative to the die support 3 and therefore relative to the upwardly opening grooves 10, 11 formed in die 7. This angular relationship between the track and the die is such that one of the legs of staple 14 is received in groove 10 of the die 7 and the other leg is received in groove 11. By this structure it will be apparent that upon downward movement of the staple 14 into engagement with the die 7 the legs 12, 13 of said staple will be bent toward each other and will cross over each other to form more than a complete loop. This provides an extremely effective securement of the casing end or whatever other article is to be fastened.

A weight 29 may be slidably received on the vertical portion 22 of rail 21 so as to assist the gravity feed of the staples 14 into the die support 3.

For the purpose of retaining the staples 14 on the rail 21 an elongated guide 30 is provided alongside the vertical portion 22 of said rail, and said guide is secured to standard 1 by means of bracket 31.

Feeding of the staples 14 along track 18 is accomplished by means of an elongated punch 34 that is adapted to be reciprocally received within track 18 at its lower end and which is secured at its upper end by means of screw 35 to an elongated rack 36 (FIG. 1). Rack 36 is slidably received in standard 1 and the latter is provided with a finished planar surface 37 along which the rack 36 slides. The lower end of rack 36 is provided with a downwardly opening recess into which the upper end of punch 34 is received before the screw 35 is applied. At this point it should be noted that the recess in which the punch 34 is received is angularly disposed relative to the plane of the rack 36 so that the rack 36 is parallel to the sides of the standard 1 and the punch 34 is angularly

disposed relative to said sides at the same angle as the track **18**.

In mesh with rack **36** is a pinion gear **40** secured to a shaft **41** which in turn is rotatably supported at one end in the side of the standard **1** and at its other end in a cover plate **42** secured to standard **1** by means of screws **43**.

Shaft **41** extends outwardly of cover plate **42** and is apertured as at **45** (FIG. 3) to receive therethrough the inner end of an elongated arm **46** which extends radially outwardly of shaft **41** and is provided at its outer end with a spherical weight **47**.

As best seen in FIG. 1, the upper "at rest" position of arm **46** corresponds to the upper position of rack **36** and in which position punch **34** is spaced upwardly from the staples **14** that are fed into the track **18**. From FIG. 1 it will be apparent that upon counterclockwise rotation of arm **46** from the upper position past its vertical position and downwardly to the position shown in FIG. 2 the rack **36** will move generally downwardly so that the punch **34** urges the staple in track **18** downwardly along said track and into engagement with die **7**. As best seen in FIG. 7, if sufficient force is applied by punch **34** the staple **14** will be bent into the shape shown and will tightly encircle the article extending through passageway **6** (FIGS. 2, 3).

The driving mechanism for the punch **34** consisting of the rack **36**, pinion **40** and weighted arm **46** has been found to be extremely effective in permitting an operator to apply a clip to an article such as a casing end very quickly and with assurance that the correct amount of force is applied to the staple **14** so as to deform it to the required degree to effect a tight grip on such article. It will be noted in this connection that the amount of movement of the arm **46** is relatively small and is readily accomplished manually. Furthermore, by providing an upper position past the vertical position of the arm **46** the punch is automatically withdrawn the correct amount to permit feeding of the next staple into track **18**. Of greater importance than this, however, is the fact that the weighted arm **46** permits the clip to be properly applied without the operator exerting a predetermined force which may be difficult to achieve. The power and the force required to effect proper deformation of the staple is ensured by the provision of the weight **47** on the outer end of arm **46** since the power developed by gravity when the arm is allowed to fall downwardly from its vertical position may readily be made sufficient to accomplish the operation by proper proportioning of the length of arm **46** and the mass of weight **47**. After the staple has been deformed by die **7** the operator merely rotates the arm **46** in a clockwise direction from its position of FIG. 2 up past the vertical position and it may then be permitted to fall downwardly by gravity from said vertical position the short distance to take it to the "at rest" position shown in FIG. 1.

In order to prevent excessive noise and undue bouncing of the arm **46** as it reaches the upper position of FIG. 1 a bumper **50** of suitable tough and resilient material such as brake lining may be applied within the recess **51** in the standard **1** (FIG. 1) so that said bumper **50** is engaged by the upper end of rack **36** when the latter reaches the upper end of its stroke corresponding to the up position of the arm **46**.

Referring again to the throat **5** of die support **3** and the generally vertically extending passageway **6** into which the casing end or other article to be fastened may be received prior to the clipping operation, it will be seen from FIG. 4 that one side of the passageway **6** is defined by the standard **1** while the lower end of the opposite side of the passageway is defined by an upwardly opening recess **51** formed in a guard plate **52** which is received within a complementarily formed recess formed in the die support **3** so that the outer surface of the guard plate **52** is flush with the outer surface of the die

support **3**. Adjacent its lower edge the guard plate **52** is secured to the die support **3** by means of a pair of screws **53** which extend through suitable apertures in guard plate **52** and are screw-threadedly received in die support **3**. Interposed between the heads of screws **53** and the guard plate **52** are relatively strong compression springs **54** which urge the guard plate **52** toward the die support **3** at all times. However, an outwardly directed force on guard plate **52** results in the same being swung outwardly to the position shown in FIG. 4 against the urgency of springs **54**. By this structure when an article such as a casing indicated at **55** in FIG. 4 is inserted through throat **5** of die support **3** and downwardly to the lower end of passageway **6** the staple **14** may be applied around said article as shown in FIG. 4 and the article then may be pulled laterally outwardly of the passageway **6** in a direction perpendicular to the die support **3** with the staple **14** engaging the inner side of guard plate **52** since it is larger in lateral extent than the upwardly opening recess **51** formed in said guard plate. By this structure it will be apparent that the operation of removing the article is considerably speeded up since it is merely necessary to pull it outwardly of the passageway rather than to reverse its direction upwardly along the passageway **6** and outwardly of throat **5**.

It will be apparent that the above described structure is one that lends itself to relatively inexpensive construction and which may be operated manually to effect an efficient fastening operation without the use of power means. The compact arrangement shown and the various features above described for speeding up the operation makes the device ideally suited for fastening operations in which the use of power is either not justified or is not possible.

The very specific description given above of the preferred form of the invention is not to be taken as restrictive as it will be apparent that various modifications in design may be resorted to by those skilled in the art without departing from the scope of the following claims.

I claim:

1. In an apparatus for fastening a clip around an article such as a casing end,

an upwardly extending standard,

a generally vertically extending track in said standard and adapted to receive therein a U-shaped pronged clip provided with a pair of legs adapted to be bent around such article,

a die at the lower end of said track for bending said legs,

an elongated punch supported for movement longitudinally of said track from an upper position out of engagement with said clip to a lower position urging said clip into engagement with said die,

a rack secured to the upper end of said punch and slidably mounted on said standard,

a pinion rotatably supported on said standard and in mesh with said rack,

driving means for said pinion including an elongated arm connected at its inner end to said pinion and adapted at its outer end to be grasped by an operator whereby said arm may be swung to rotate said pinion and drive said punch along said track for forceably feeding such clip into engagement with said die,

said arm being provided at its outer end with a weight, and,

stop means for arresting upward movement of said rack and punch at a point at which said arm has passed a vertical upwardly extending position and assumes a position of rest angularly offset from said vertical position.

2. Apparatus according to claim **1** wherein said rack and pinion and driving means are proportioned so that said arm swings through an angle of less than 360° from said position of rest to a position with said punch in co-

operation with said die with said clip interposed therebetween.

3. Apparatus according to claim 2 wherein said angle of swing is about 180°.

4. In a machine for fastening a two-legged wire clip around an article such as a casing end,

a die member formed to provide a pair of side by side grooves with the central planes of said grooves parallel and with said grooves extending along their lengths in substantially circular arcs having coaxial centers in said central planes and with each groove being formed to a uniform arcuate cross sectional contour,

an elongated track adapted to receive a clip therein for movement of said clip along a path of travel having a central line of action intermediate said central planes of said grooves and into engagement with said grooves with the free ends of the legs of said clip leading,

punch means in said track for so moving said clip toward said die,

said track being angularly offset relative to said grooves whereby one leg of said clip is received in each of said grooves,

the projected length of said grooves in a plane perpendicular to said path of travel being substantially greater than the maximum width of said clip whereby the free ends of the legs of said clip initially engage portions of said grooves that are at a substantial angle to the path of travel of said clip whereby said free ends are deflected inwardly toward each other upon engagement with said grooves and whereby said legs are bent past each other upon continued deformation of said clip under the urgency of said punch means.

References Cited by the Examiner

UNITED STATES PATENTS

1,897,511	2/33	Taylor	81—9.1
2,265,277	12/41	Gerbe	29—243.57
2,682,054	6/54	Lindstrom	29—243.57
2,970,369	2/61	Foster et al.	29—203
2,972,747	2/61	Kelem	29—211
3,026,521	3/62	Panfili	29—243.57 X
3,137,932	6/64	Erdmann	29—211

WILLIAM FELDMAN, *Primary Examiner.*

MILTON S. MEHR, *Examiner.*