

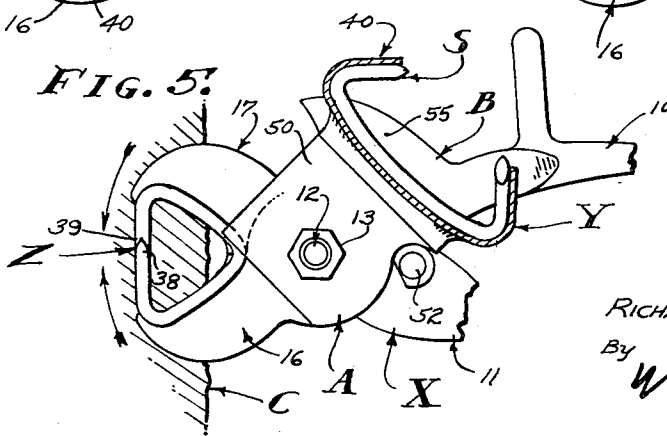
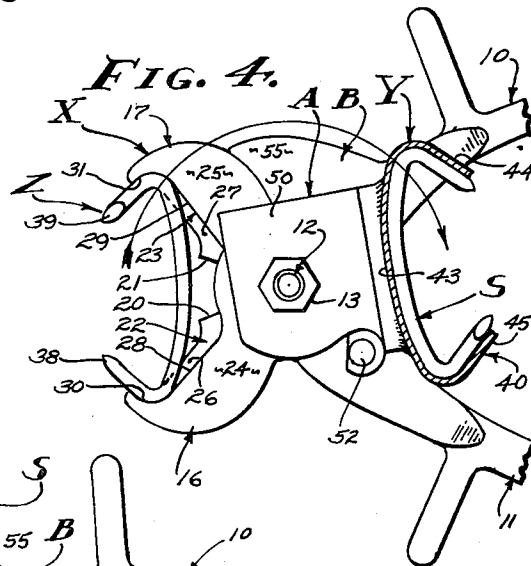
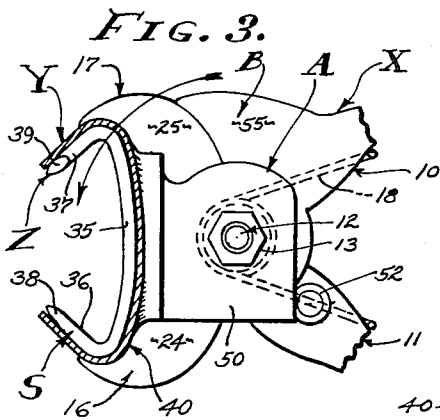
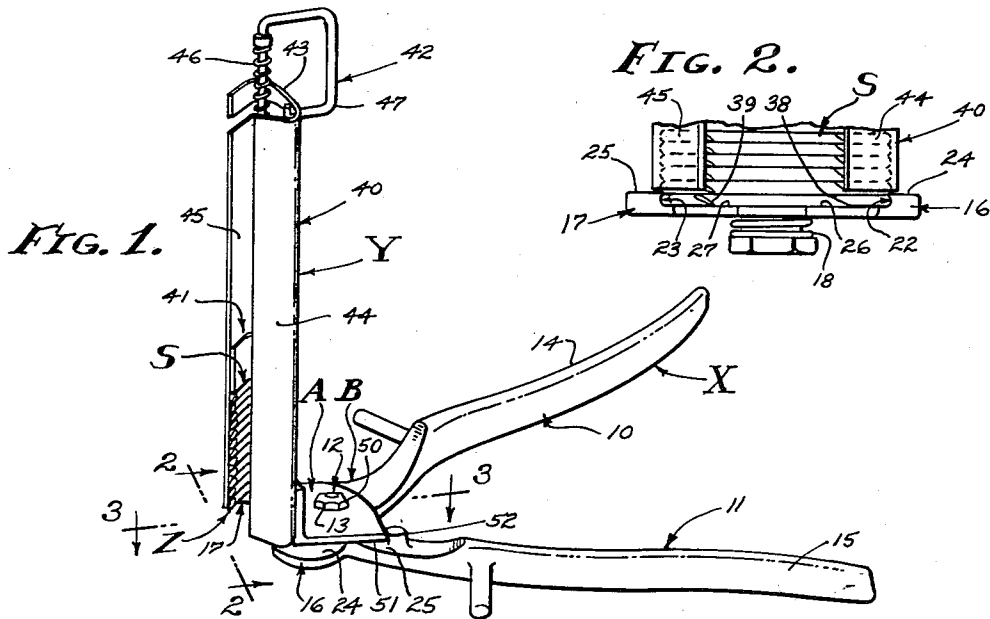
Nov. 20, 1962

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3,064,263

TOOL FOR APPLYING HOG-RINGS AND THE LIKE

Filed April 28, 1958



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3,064,263

TOOL FOR APPLYING HOG-RINGS AND THE LIKE
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Filed Apr. 28, 1958, Ser. No. 731,156
3 Claims. (Cl. 1—187)

This invention relates to a tool for applying hog-ring type fastener elements and is particularly concerned with a device for clinching fastener elements and which involves a magazine for supplying the fastener elements thereto for the clinching process, it being a general object of this invention to provide a tool of this type that can be applied directly to a piece of work without interference of the magazine with said work.

Tools for applying hog-rings and the like are in use and are adapted to receive and process U-shaped fastener elements that are closed into ring-shaped elements by a clinching process carried out by said tools. In order to expedite processing of the fastener elements, a magazine is cooperatively related to the fastener processing parts of the tool so that individual fastener elements are automatically and consecutively fed into processing position. The particular tool under consideration is a hand operated tool resembling a "pliers" and it is common practice to fixly relate the magazine to the fastener processing parts of the "pliers." That is, the magazine is positioned to deliver fastener elements into processing position between the jaws of the "pliers" and the magazine is ordinarily fixed relative to one or both of the jaws to move therewith.

The above mentioned combination of elements operates satisfactorily to clinch fastener elements but is a very cumbersome and unhandy relationship of parts. Specifically, there are numerous situations where it is desired to apply hog-ring fastener elements to work parts that interfere with the magazine of the tool. In tools of this particular type, the magazine projects from the jaws in a direction normal to the plane of the "pliers" in which case the magazine, which is at the extreme front of the tool, prevents access and proper approach to the work. In some instances, presence of the magazine prevents use or employment of the tool.

An object of this invention is to provide a tool for handling and clinching hog-ring type fastener elements wherein the magazine thereof does not interfere with insertion of the tool into work for the process of clinching said elements.

It is an object of this invention to provide a tool for handling and clinching hog-ring type fastener elements wherein the magazine thereof is shiftably related to the processing parts of the tool so as to be moved in order to facilitate insertion of the tool into work for the process of clinching said elements.

Another object of this invention is to provide a tool for handling and clinching hog-ring type fastener elements wherein the said elements are fed into processing position by a magazine and wherein the processing parts of the tool are insertable into the work for installation of the fastener elements. For example, the processing parts, or jaws, of the tool can be buried in the work, as later described.

It is another object of this invention to provide a relatively simple and yet practical tool of the type hereinabove referred to that is inexpensive of manufacture and which is easily used and which greatly facilitates processing and installation of hog-ring type fastener elements.

The various objects and features of my invention will be fully understood from the following detailed description of a typical preferred form and application of my

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invention, throughout which description reference is made to the accompanying drawings, in which:

FIG. 1 is a perspective view of a hand operated "pliers" type tool for applying hog-ring type fastener elements and embodying the features of the present invention. FIG. 2 is an enlarged detailed view of a portion of the tool shown in FIG. 1 and is a view taken as indicated by line 2—2 on FIG. 1. FIG. 3 is an enlarged plan view of a portion of the tool shown in FIG. 1 and taken as indicated by line 3—3 on FIG. 1. FIG. 4 is a view similar to FIG. 3 and shows the manner in which the magazine of the tool is shifted, and FIG. 5 is also a view similar to FIG. 3 and shows the manner in which the jaws of the tool operate to clinch the fastener elements when the magazine is shifted away from the jaws.

The fastener applying tool that I provide involves, generally, a hand-operated "pliers" X and a magazine Y cooperatively related thereto to handle a plurality of fasteners Z to deliver them consecutively to the "pliers" X for the process of clinching. In accordance with the invention, the jaws of the "pliers" X are adapted to be inserted into work during the process of clinching by virtue of means that I provide for shifting the magazine Y relative to the said jaws, all as hereinafter described.

As shown, the "pliers" X is basically a usual "pliers" involving a pair of levers 10 and 11 pivotally joined together by a pivot 12. The pivot 12 is suitably shouldered and is threaded to receive a nut 13 for holding the levers in assembled relationship. The levers 10 and 11 have like oppositely related handles 14 and 15 and like opposing jaws 16 and 17. The handles 14 and 15 are of substantial length while the jaws 16 and 17 are short coupled in order to gain the desired mechanical advantage. A suitable spring 18 yieldingly urges the handles 14 and 15 apart so that the jaws are normally held apart in opposed relationship (see FIGS 1 and 3).

The opposed jaws 16 and 17 are provided to engage with a U-shaped fastener Z and are adapted to be brought together to a predetermined position whereby the fastener is processed by clinching it into a ring shape. For the purpose of carrying out this clinching process the jaws 16 and 17 have opposed stop faces 20 and 21, and opposed recesses 22 and 23, respectively (see FIG. 4). The jaws 16 and 17 are carried in a common plane and so that the tops 24 and 25 thereof are coincidental. The recesses 22 and 23 are formed in the tops 24 and 25 and present upwardly facing shoulders 26 and 27 to form stops for the fasteners Z. As shown, the recesses have substantially radially extending walls 28 and 29 projecting from the pivot 12 and terminating in inwardly turned walls 30 and 31 joined with the walls 28 and 29 through suitably filleted corners. The walls 28 and 29 and 30 and 31 are arcuate or hook shaped in vertical cross sectional configuration forming channels in order to retain the fastener in the recesses during the clinching process (see FIG. 2). The stop faces 20 and 21 limit inward movement of the jaws 16 and 17 (see FIG. 5).

The hog-ring type fastener elements Z that are adapted to be handled by the "pliers" X are provided in stacked relation. That is, a stack S of U-shaped fasteners Z is provided in which the individual fastener elements are secured one to another by suitable means, for example by means of an adhesion film applied to or over the plurality of elements. The particular fasteners illustrated are designed specifically to form hog-rings and involve an elongate spreader portion 35, and inwardly turned end portions 36 and 37. The end portions 36 and 37 are straight parts angularly related to the spreader portion 35 and provided with mating ends 38 and 39. The ends are pointed for penetrating properties, and they are oppositely flattened to mate with each other. The spreader

portion 35 is arcuate or bowed away from the angularly projecting end portions 36 and 37, and said portions of the fastener are formed of suitable wire, preferably round wire, joined by bent portions.

The magazine Y is provided to carry a supply of fasteners Z in the form of a stack S, as above described, and deliver them individually, one at a time, to be received in the recesses 22 and 23 in the jaws 16 and 17, respectively. The magazine Y involves generally a body 40, a follower 41, and means 42 urging the follower forwardly in the body 40. The body 40 is elongate and is open along one side and at its ends. The body 40 is formed to the configuration of the fasteners Z and has an arcuate back 43 to guide the portions 35 of the fasteners and has inwardly turned angularly related sides 44 and 45 to guide the end portions 36 and 37 of the fasteners. The axis of the body 40 is normally related to the tops 24 and 25 of the jaws 16 and 17 and the lower open end of the body 40 has sliding engagement with the tops 24 and 25. The follower 41 slides in the body to be yieldingly urged against the top of the stack S of fasteners to move the lowermost fastener Z into the recesses 22 and 23 when the magazine is aligned with the open jaws 16 and 17 (see FIGS. 1, 2 and 3). The means 42 involves a spring 46 releasably anchored by a rod 47 to press against the follower 41.

In accordance with the invention, I have provided means A for shiftably carrying the magazine Y relative to the jaws 16 and 17, that is, to shiftably carry the magazine from an aligned registering position such as shown in FIG. 3 to a remote position laterally removed as shown in FIG. 4. For this purpose I provide a base 50 that extends laterally from the back 43 of the magazine body 40 to be rotatably engaged with the pivot 12 above described. It is preferred that the base 50 be a flat plate-like part and it has a bottom 51 in the plane of the open lower end of the magazine body 40, the bottom 51 having sliding engagement with the tops 24 and 25 of the jaws. When the magazine Y is positioned as shown in FIG. 3 the base is moved counter-clockwise, as indicated by the arrow, and is engaged with a stop 52 on one of the lever elements preferably the lever 11. When the magazine Y is positioned as shown in FIG. 4 the base is moved clockwise, as indicated by the arrow, and is engaged with a stop, preferably the same stop 52, from the opposite side thereof. The base 50 can be shaped to engage the stop 52, as desired, to gain the required rotative movement, as circumstances require.

In carrying out the present invention the jaws 16 and 17 must be properly positioned to receive a fastener Z and, therefore, I provide a stop lug 55 that limits separation of the jaws under pressure of the spring 18. Further, means B is provided to retain the stack S of fasteners within the magazine Y when the latter is moved to the remote laterally displaced position as indicated by the arrow in FIG. 4. The means B involves the lug 55 which is arcuate in form and extends about the pivotal axis of the structure to form a continuation of the tops 24 and 25 and to have supporting engagement with the lowermost fastener Z carried by the magazine Y.

In order to use or employ the "pliers" X to advantage, for example to apply a hog-ring fastener Z into a body of material, such as for instance into a bale of cotton C, or the like (see FIG. 5), the magazine Y is firstly positioned as shown in FIGS. 1 and 2 in order to deliver and deposit a fastener Z within the recesses 22 and 23 and against the shoulders 26 and 27. The vertical extent of the recesses 22 and 23 is equal to the thickness of one fastener Z. Secondly, the magazine is then shifted to the remote laterally displaced position shown in FIG. 4 thus shearing the lowermost fastener Z from the stack S and leaving it deposited within the recesses 22 and 23. Slight hand pressure upon the handles 12 and 13 retains the severed fastener in clinching position and the bare pro-

jecting sharpened ends of the fastener Z may be forced into the bale of cotton whereupon closing of the "pliers" X causes buckling and bending of the spreader portion 35 allowing the mating faces of the ends 36 and 37 to come together into engagement.

From the foregoing, it will be apparent that the clinching process of the fastener Z is carried out with the magazine Y laterally removed and carried to one side in a remote position. Further, said clinching process may be carried out with the jaws of the "pliers" inserted in or entering into a body of material. The above set forth method of operation is easily carried out by said simple manipulation of the magazine relative to the "pliers" followed by operation of the "pliers" to bend the fastener into the shape of a hog-ring.

Having described only a typical preferred form and application of my invention, I do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to myself any variations or modifications that may appear to those skilled in the art and fall within the scope of the following claims.

Having described my invention, I claim:

1. A tool for clinching fasteners and including, a pair of levers rotatably coupled by a pivot, a pair of opposed jaws operatively carried by the levers respectively and adapted to receive a fastener therebetween, a magazine aligned with the jaws and handling a plurality of fasteners for consecutive reception and positioning between the jaws, a part of the magazine being rotatably coupled to said pivot to move to a position remote from alignment with the jaws, and a stop carried by one of the levers and limiting movement of the magazine.

2. A tool for clinching fasteners and including, a pair of levers rotatably coupled by a pivot, a pair of opposed jaws operatively carried by the levers respectively and adapted to receive a fastener therebetween, a magazine normally aligned with the jaws and handling a plurality of fasteners for consecutive reception and positioning between the jaws, a part of the magazine being rotatably coupled to said pivot to move in said plane of the jaws to a position remote from alignment with the jaws, and a stop carried by one of the levers and limiting movement of the magazine between said position aligned with the jaws and said remote position.

3. A tool for clinching fasteners and including, a pair of levers rotatably coupled by a pivot, a pair of opposed jaws with top faces in a common plane and operatively carried by the levers respectively and with recesses adapted to receive a fastener therebetween, a magazine engaged with the top faces of the jaws and normally aligned with the recesses and normal to the plane of the top faces and handling a plurality of fasteners for consecutive reception and positioning in the said recesses, a part of the magazine being rotatably coupled to said pivot to move in said plane of the top faces to a position remote from alignment with the recesses, and a stop carried by one of the levers and limiting movement of the magazine between said position aligned with the recesses and said remote position, at least one of said top faces having sliding supporting engagement with the fasteners in the magazine when shifted from said aligned position.

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