March 3, 1953 B. K. GANN 2,630,030

PRESSER FOOT FOR RIVET SETS

Filed May 5, 1949 2 SHEETS—SHEET 1

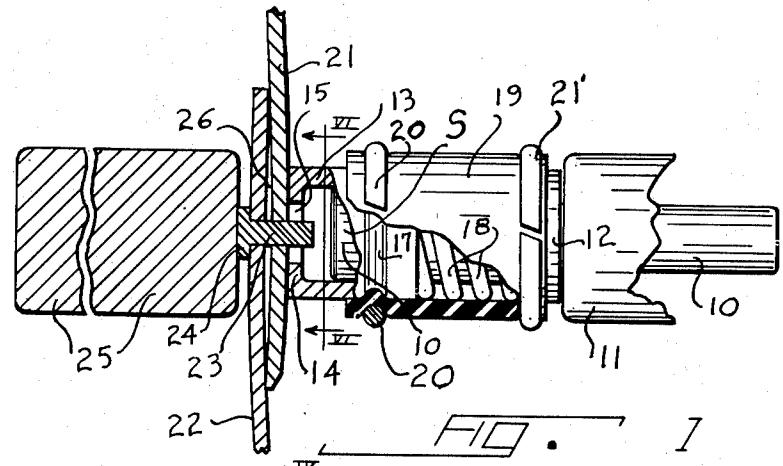


FIG. 1

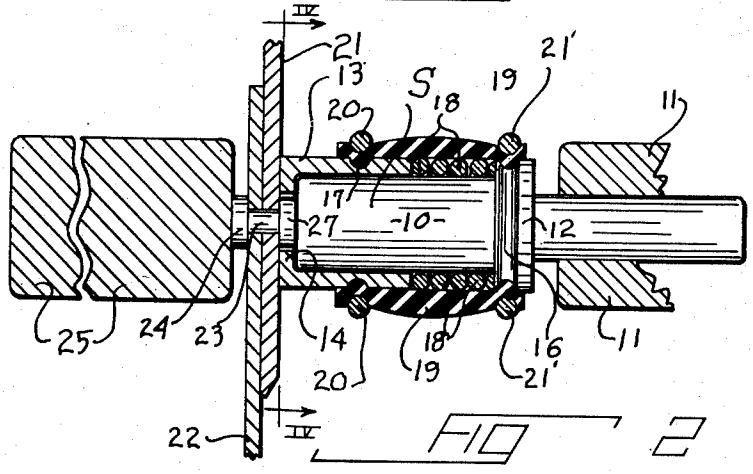


FIG 2

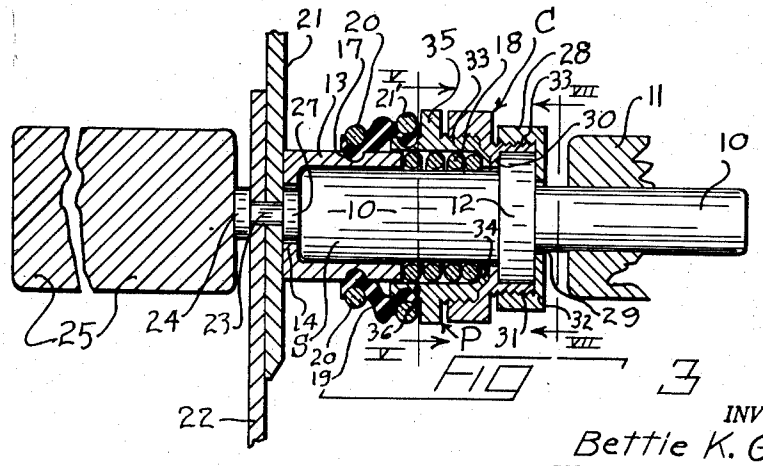


FIG 3

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PRESSER FOOT FOR RIVET SETS

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2 SHEETS—SHEET 2

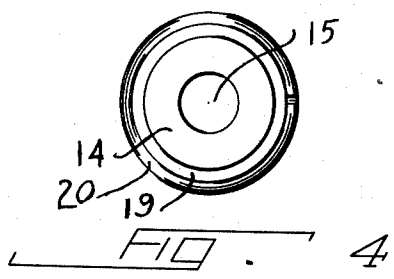


FIG. 4

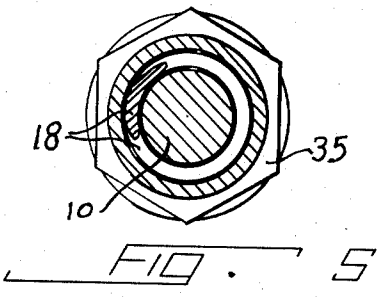


FIG. 5

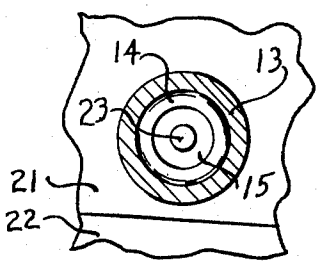


FIG. 6

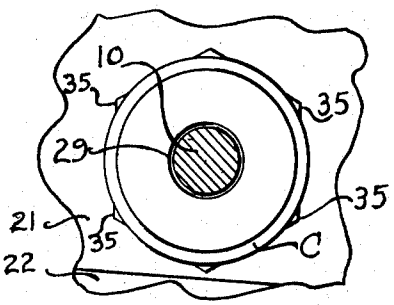


FIG 7

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PRESSER FOOT FOR RIVET SETS

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Application May 5, 1949, Serial No. 91,474

2 Claims. (Cl. 78—46)

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My invention relates to an improvement in a presser foot for rivet guns, and is an improvement over my co-pending application entitled "Presser Foot For Rivet Guns," filed April 16, 1945, Serial No. 588,601, and now abandoned.

An object of the present invention is to provide a presser foot device that is attachable to any standard rivet set such as commonly used in rivet guns.

A further object of the invention is to provide a presser foot of the kind mentioned which has a dual purpose; first, to press two pieces of material solidly together and so hold the pieces prior to, and during the process of riveting, and second, while performing the foregoing mentioned operation, to provide a gauge wherein the diameter and thickness of the rivet head to be formed is definitely predetermined.

Another object of the invention is to provide a presser foot of the kind mentioned that is detachably attachable to any standard rivet set, thereby making the presser foot safe and free from the possibility of being thrown from the rivet set in case the rivet gun were set into motion without the presser foot being in engagement with something, for example, one of the two pieces that are to be riveted together.

A further object of this invention is to provide a presser foot of the kind mentioned in which adjustments are provided for varying the pressure exerted on the material to be riveted together prior to and during the process of riveting.

A still further object of the invention is to provide a presser foot of the kind mentioned that is simple, light in weight, easy to make, easy and quick to assemble on a rivet set, one that is sturdy and long lived, and one that is inexpensive. These and other objects will be more fully described as this description progresses.

Now referring to the accompanying drawings in which similar numerals of reference designate the same parts throughout the several figures of the drawings;

Fig. 1 is a detail combination side and sectional view of the simple form of the presser foot device, the device being shown in position to do a job of pressing preparatory to the act of riveting.

Fig. 2 is a detail sectional view of the simple form of the presser foot, the view showing the presser foot and associated elements in section.

Fig. 3 is a detail sectional view through a modified form of the presser foot and parts associated therewith.

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Fig. 4 is an end view of the presser foot device, the view being as seen from the line IV—IV in Fig. 2 and looking in the direction of the arrows.

Fig. 5 is a detail sectional view through the modified form of the device, the view being as seen from the line V—V in Fig. 3 and looking in the direction of the arrows.

Fig. 6 is a detail sectional view through the simple form of the device, the view being as seen from the line VI—VI in Fig. 1 and looking in the direction of the arrows.

Fig. 7 is a detail sectional view through the modified form of the device, the view being as seen from the line VII—VII in Fig. 3 and looking in the direction of the arrows.

In the drawings is shown a standard rivet set 10 for use in a rivet gun 11. The rivet set 10 has an outwardly extending flange 12 extending therearound.

The simple form of the presser foot as shown in Figures 1, 2, and 4 consists of a sleeve 13 in which the set end S of the rivet set 10 is slidably positioned. One end of the sleeve 13 has an inturned annular flange 14 that is an integral part of the sleeve 13 and defines a hole 15 that is the diameter of a rivet head that is to be formed therein as will later be described. The flange 14 is of the same thickness as that of the rivet head that is to be formed in the hole 15.

The rivet set flange 12 has a groove 16 in the outer edge of the flange 12. The rivet set flange 12 has substantially the same outside diameter as that of the sleeve 13. The sleeve 13 has a groove 17 therearound and on the outside thereof for purposes that will later be made obvious.

As shown in Figures 1 and 2, the device is provided with a helical compression spring 18 that surrounds the rivet set portion S and is interposed under compression between the rivet set flange 12 and the opposing end of the presser foot sleeve 13.

A resilient or elastic sleeve such as a piece of rubber tubing or the like 19 is slipped over the presser foot sleeve 13, spring 18, and onto the rivet set flange 12. The resilient sleeve 19 having thus being positioned a contractable spring tensioned cut ring 20 is slipped over one end of the elastic sleeve 19 and is seated over the sleeve 19 and into the groove 17 in the presser foot sleeve 13. A second contractable spring tensioned cut ring 21' is slipped over the other end of the elastic sleeve 19 and is seated over the end of sleeve 19 and into the groove 16 in the flange 12 of the rivet set 10. This having been

done the presser foot 13—14 is slidably attached to the rivet set 10 and the flange 14 is resiliently held in a spaced position away from the end of the rivet set portion S by reason of the pressure of the spring 18.

The operation of the device as shown in Figures 1, 2, 4 and 6 is as follows. The work is prepared for riveting by placing one piece of sheet metal 21 over another sheet 22 whereupon a hole is drilled through both sheets 21 and 22. This having been done, the leg 23 is passed through the hole and moved until the rivet head 24 rests against the sheet 22 in the usual manner. This having been done a bucking bar 25 is placed against the rivet head 24 preparatory for the job of riveting.

If a satisfactory job of riveting is to be achieved both sheets 21 and 22 must lay flat and bear against each other at and during the time of the riveting process. Sometimes the sheets 21 and 22 do not lay against each other and therefor a space 26 will be existent between the sheets 21 and 22. It is one of the objects of my improved presser foot to do away with this space 26 and this is accomplished as follows.

After the two sheets 21 and 22 have been prepared for riveting as above described the rivet set 10 having the presser foot 13—14 thereon is mounted in the rivet gun 11. Now the presser foot 13—14 is placed over the end of the rivet leg 23 so that the rivet leg 23 passes through the hole 15 and into the hollow of the sleeve 13 whereupon the flange 14 will bear against the sheet 21. Now as the gun 11 is advanced toward the sheet 21 the presser foot 13—14, under the pressure of the spring 18 will press and hold the sheet 21 tightly against the sheet 22, and as the gun 11 advances the end of the rivet set section S will engage the end of the rivet leg 23 at which time the operator sets the rivet gun in action whereupon the rivet set 10 is driven against the end of the rivet leg 23 with a series of powerful strokes under which the metal of the rivet leg 23 is battered and mashed to fill the hole or opening 15, the result of which is the formation of a head 27 from the rivet leg 23, the rivet head 27 being of the same shape or diameter of the hole 15 and the thickness of the flange 14. This forms a perfect rivet head 27 and all the heads 27 formed are uniform in size and shape.

Sometimes sheets 21 and 22 of heavier material may be used and the pressure of the spring 18 is insufficient to press the two sheets 21 and 22 together to eliminate the space 26 between the two sheets 21 and 22. In view of this difficulty, I have provided a modified form of the presser foot drive that is built as shown in Figures 3, 5, and 7, and in which provision is made for adjustably increasing or decreasing the pressure of the spring 18 that is applied to the sheet 21.

In Figures 3, 5, and 7 the device is shown as having a cup-like element 28 that has a hole 29 through which the stem of the rivet set 10 slidably passes to position the flange 12 of the rivet set 10 in the cup-like element 28. The inner face of the wall of the cup-like element 28 is threaded to secure the threaded end of another member C of the device.

The device is provided with an annular clamp element C, one end of which has an inside diameter sufficient in size to slidably receive the flange 12 of the rivet set 10 which will abut an inwardly extending annular flange 30 that is an integral part of the clamp element C. The outside of that portion of the clamp element C in which the rivet set flange 12 is received is threaded as at 31 and is threadedly received in the cup-like element 28 to provide a solid and rigid mounting of the presser foot device on the rivet set 10. The end 32 of the part C has an inside diameter that is larger than that of the other end of the clamp element C and is internally threaded to receive the threaded end 33 of a spring pressure adjustment element P, one end of which has an inwardly directed annular flange 34 that serves as a spring bearing for one end of the spring 18, the other end of which bears against the opposing end of the sleeve 13. The part P is provided with a multisided portion 35 as a wrench hold by which the part P may be turned for spring pressure adjustment purposes. The part P also has a skirt portion 36 in which a part of the spring 18 is housed, and to which one end of the resilient sleeve 19 is attached, the attachment means being the same as previously described. The other end of the resilient sleeve 19 being attached to the sleeve 13 the same as previously described.

The operation of the modified form of the device as just described is the same as the simple form of the device except that by turning the adjustment element P it may be moved so that the flange 14 may be spaced closer or farther away from the end S of the rivet set whereby it will be necessary to compress the spring 18 less or more to bring the end of the rivet set into engagement with the end of the rivet leg 23 whereupon this adjusted pressure of the spring 18 will be imposed on the sheet 21 for the purposes afore described.

While the device as shown and described may be the preferred form of the device it is to be understood that such modification of the device as lie within the scope of the appended claims may be employed without departing from the spirit and intention of the invention. Now having fully shown and described my invention, what I claim is:

1. In a presser foot device for use on a rivet set having a flange thereon that is spaced away from the set end of the rivet set; said presser foot device comprising a sleeve element for slidably receiving a portion of the set end of the rivet set, one end of said sleeve having an inwardly extending flange that defines an opening to receive a portion of a rivet leg, said opening being smaller than the inner dimension of the sleeve and being of such shape, size and depth as to fashion a rivet head therein that is to be formed from the aforementioned rivet leg, a fitting attachable to the flange of the rivet set, said fitting having a second fitting attachable thereto and longitudinally adjustable thereon, a helical spring, said helical spring being positioned around the set end of the rivet set and bearing one end on the other end of the sleeve and the other end of the spring bearing against the said second fitting, and means connecting between the said sleeve and said second fitting for attaching the sleeve and fitting together and permitting movements of the sleeve and fitting relative to each other.

2. In a presser foot device for use on a rivet set; said device having a clamp assembly for rigid attachment to the rivet set, a spring abutment element, a helical spring, a presser foot and a means for resiliently holding the several parts of the device together, said spring abutment element being threadedly attached to the clamp assembly for longitudinally adjusting the spring abutment element, said helical spring being positioned intermediate the spring abutment element and one end of the said presser foot, said means for re-

siliently holding the several parts of the device together being a resilient tube positioned around the spring and attached one end to the spring abutment element and the other end to the presser foot element, said presser foot element being a tube for slidably receiving one end of the rivet set, said tube having an inwardly directed flange on one end thereof that defines an opening of a certain size, shape and depth to receive a portion of a rivet leg from which a rivet head is to be formed in and to fill the above-mentioned opening.

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