May 16, 1933. J. A. DEVENDOR ET AL 1,908,824

JEWEL SETTING DEVICE

Filed Dec. 31, 1930

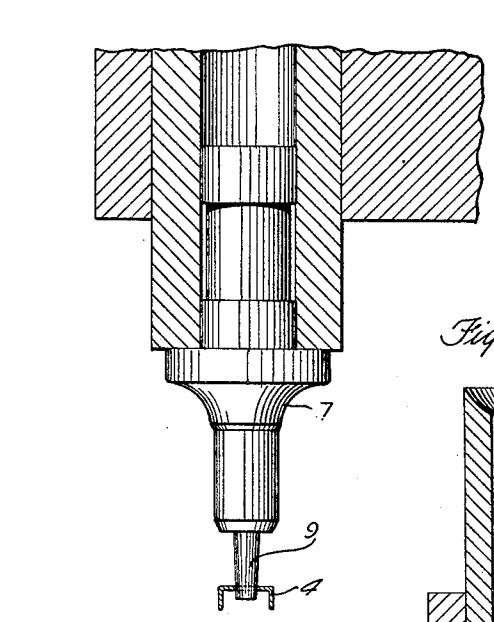


Fig. 1.

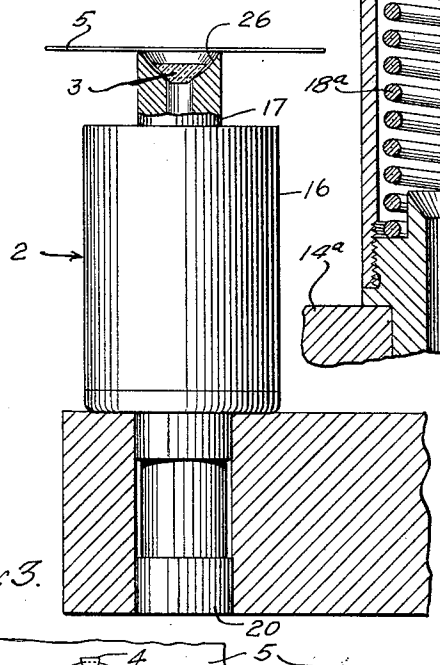


Fig. 3.

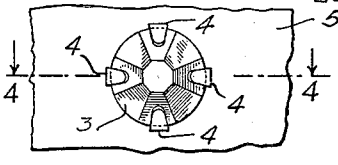
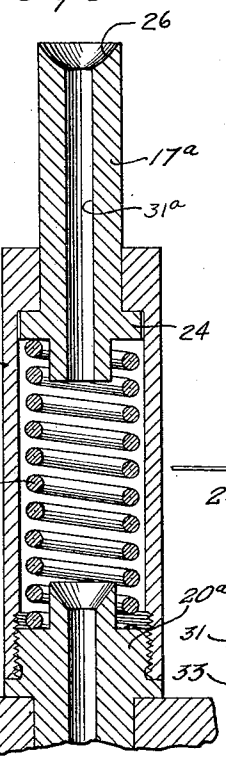




Fig. 4.

Fig. 5.



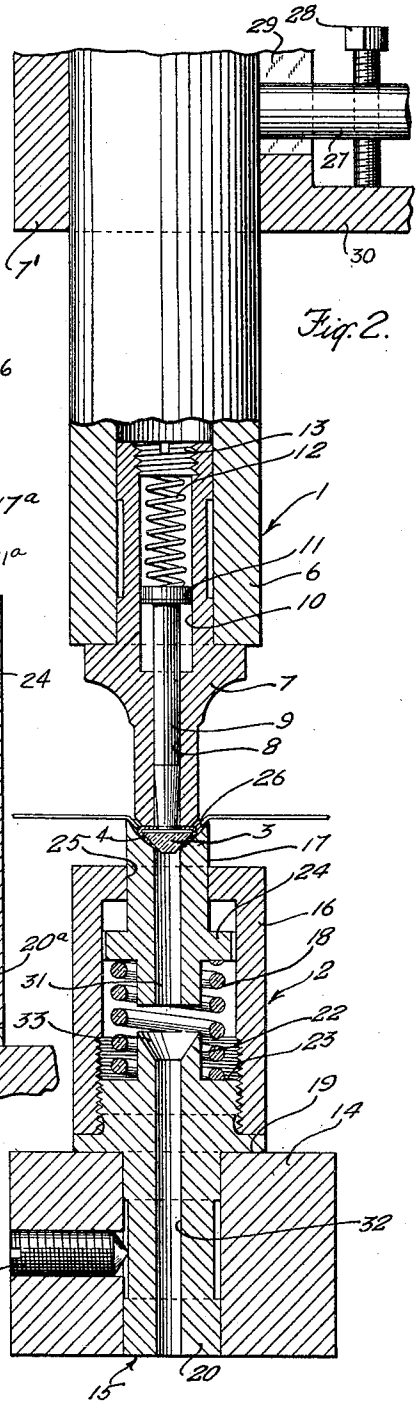


Fig. 2.

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UNITED STATES PATENT OFFICE

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JEWEL SETTING DEVICE

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This invention relates to apparatus for attaching ornaments to garments and more particularly to apparatus for driving a multiple pronged setting or staple through one or more plies of fabric and clinching the prongs about the marginal portion of an ornament in the nature of a jewel or an imitation jewel.

In accordance with the practice of the prior art, it has been customary to support the ornament or jewel in a cupped anvil, to locate the fabric over the anvil, and to drive the setting downward through the fabric and into the anvil. In all machines of the prior art with which we are familiar, the anvil has been unyielding. Since the jewels or ornaments take a variety of forms, and, even when graded and carefully sorted, vary materially in thickness, there has been a serious liability in these prior art machines that too much pressure would be applied at the setting operation with resultant breaking of jewels and tearing of fabrics, or that too little pressure would be applied with the result that the setting prongs would not clinch the jewel firmly. Breakage of stones and tearing of material is obviously objectionable. Loosely clinched settings are also highly objectionable for the reason that they are apt to permit the jewel to be lost, and for the further reason that the prongs are apt to catch and snag the garments of the wearer.

Not only are the results secured by the prior art machines unsatisfactory, but since the application of a proper amount of force calls for judgment and experience, it is necessary to employ expensive skilled operators for operating the machines, and the work accomplished by each operator is necessarily held down by the care which the operator is required to exercise.

It is a primary object of the present invention to contrive a mechanism for accomplishing the work of the kind referred to in which all of the drawbacks mentioned above are eliminated; that is, to contrive a mechanism which may be operated by unskilled operators and in which all liability of breaking sound jewels and of attaching jewels with the prongs insufficiently clinched is avoided.

To these ends it is a salient feature of the present invention that provision is made for permitting the driver and the anvil to move in unison against a yielding resistance after a sufficient pressure has been exerted between them to securely clinch a setting. As illustrated herein, the anvil is yieldingly supported by a fairly stiff spring, this spring being strong enough to support the anvil against a force sufficient to clinch the staple properly but being weak enough to yield before sufficient force has been applied to break the jewel or damage the fabric to which the jewel is being applied.

Since it is desired to keep the apparatus compact, it is preferable to limit the distance which the anvil may yield. Since this, however, might result at times in moving the anvil through the full stroke permitted by the spring and in bringing it up against a positive stop so that positive pressure might be applied to the jewel sufficient to break it, provision is made in accordance with a further feature of the invention of adjustable means for positively limiting the stroke of the driver. By this means the application of positive pressure to the jewel is definitely prevented and the operator is relieved altogether of the responsibility of imparting a measured force to the driver.

Other objects and advantages will hereinafter appear.

In the drawing forming part of this specification:

Figure 1 is a fragmentary, sectional elevation of an ornament attaching mechanism embodying features of the present invention;

Figure 2 is a fragmentary, sectional elevation of the same mechanism with the parts in setting applying position, parts being broken away to reveal the interior construction of the anvil and the driver;

Figure 3 is a plan view of a piece of material having a jewel applied thereto;

Figure 4 is a sectional view on the line 4—4 of Figure 3; and

Figure 5 is a sectional view of a modified form of anvil.

In Figures 1 and 2, disclosure is made of a driver 1, an anvil 2, a jewel 3, a setting 4, and a piece of fabric 5. In Figure 1 the

anvil and the driver are shown separated, while in Figure 2 the parts are shown in setting clinching position, the setting prongs having been driven through the fabric 5 by the driver and clinched by the anvil to embrace and grip securely marginal portons of the jewel 3. The driver comprises a hollow cylindrical body portion 6 suitably guided in a fixed bearing bracket 7 and connected for operation by an operating lever or arm (not shown) which is adapted to be depressed by a treadle (not shown) and to be elevated by a spring (not shown) or its equivalent. The driver body 6 carries a driver head 7 at the lower end thereof. The driver head has a cylindrical opening 8 in the lower end thereof in which a jig pin is slidably received and a larger bore 10 in the upper end thereof in which a head 11 formed on the jig pin is adapted to reciprocate. A compression spring 12 is positioned in the bore 10 and bears against the head 11 of the jig pin and against a plug 13 threaded into the upper end of the bore 10. The spring 12 is a rather light spring whose function is to hold the jig pin normally projected beyond the lower end of the driver head in the position shown in Figure 1 so that the settings 4 may be impaled upon it.

The anvil 2 is mounted upon a fixed support 14 and comprises a fitting 15, a thimble 16, an anvil plunger 17, and a stiff compression spring 18. The fitting 15 includes a flange 19 which rests upon the fixed support 14 and a shank 20 which is received in a cylindrical opening of the support 14 and fixed therein by means of a set screw 21. The fitting 15 is reduced at its upper end to provide a guiding post or hub 22 for the lower end of spring 18 and to provide a shoulder 23 upon which the lower end of spring 18 bears. The anvil plunger 17 is provided with a flange 24 which fits the bore of the thimble and which bears against the upper end of the spring 18. The upper end of the anvil plunger snugly fits a cylindrical opening 25 formed in the top of the thimble 16 while the lower end forms a guiding boss or hub for the upper end of the spring 18. The thimble 16 is threaded at its lower end onto the fitting 15. The arrangement is such that the anvil plunger is normally held at the upper limit of its stroke as illustrated in Figure 1, the flange 24 being held against the upper inner surface of the thimble 16.

The anvil plunger 17 is provided with a socket or recess 26 whose walls slope upward at an inclination less than that of the facets of the jewel to be set. The jewels are graded within certain rather coarse limits as to thickness.

The operation is as follows: A jewel 3 is set in the socket 26, a piece of fabric 5 is correctly positioned over the jewel, a setting 4 is impaled upon the jig pin 9 and the treadle of the machine is depressed to thrust the plunger downward. The jig pin 9 engages the material overlying the back of the jewel, is arrested, and is thereby caused to retreat into the driver. The continued descent of the driver head 7 forces the setting prongs through the material, causes them to engage the anvil socket and to be deflected inward around the marginal portions of the jewel facets. Continued descent of the driver causes the driver head 7 to apply direct pressure through the setting and the fabric to the back of the jewel. If the anvil were unyielding, the force applied to the driver, unless nicely measured, would be apt to shatter the jewel and to shear or bruise the fabric. Because of the provision of the spring 18, however, such injurious consequences cannot arise, regardless of the amount of force applied to the anvil, for the reason that the pressure permitted through the fabric and through the jewel cannot exceed the resistance offered by the spring 18. When the driver head 7 bears directly against the back of the jewel, therefore, if its force is not spent the application of the excessive force applied will only result in a depression of the anvil and not in damage to the jewel or the fabric.

In order to avoid the positive application of force, however, provision is further made of adjustable means for limiting the down stroke of the driver so that under no circumstances can the driver force the anvil plunger down against the hub 22 and then apply destructive pressure to the jewel and to the fabric. To this end the driver body 6 is provided with a laterally projecting arm 27 through which an adjustable abutment screw 28 is threaded. The arm 27 plays in a slot 29 of the driver guiding bracket 7. The abutment screw 28 is adapted to limit downward movement of the driver by coming into engagement with a fixed stop 30. When the size of jewel for a run of work has been determined, the abutment screw 28 is adjusted by placing one of the jewels in the socket 26 depressing the driver into engagement with the jewel but not with sufficient force to depress the anvil and adjusting the screw 28 so that it just engages the stop 30 with the parts so positioned. If it now turns out that the jewel used for gaging purposes was one of the thickest of the lot, the variation is nevertheless small enough so that when the thickness of a setting back and the thickness of the fabric are taken into account a firm clinching of the setting upon even the thinnest of the lot of jewels to be operated upon will be assured. If, on the other hand, the jewel used for gaging was one of the thinnest of the lot, the stroke permitted the anvil is such that the thickest jewels of the lot may be attached without any danger of the application of positive pressure through the jewel. By virtue of the provision of the adjustable abutment

screw 28, the operator is relieved of all obligation to measure the stroke and may proceed with the utmost assurance that no damage will be done to the fabric under any circumstances and that no jewel will be damaged unless it is a defective jewel which should not in any case be used.

Since such defective jewels are occasionally encountered, it is desirable that provision be made for disposing of the broken bits of such jewels so as to avoid jamming the anvil with the broken fragments. To this end the anvil plunger 17 is provided with a central bore 31. For the same purpose the fitting 22 is provided at the upper end thereof with a funnel-shaped opening 33 letting into a bore 32 that passes through the fitting 22, so that any jewel fragments falling through the bore 31 will be collected and guided by the funnel opening 33 and caused to fall into and through the bore 32.

In Figure 5 disclosure is made of a modified form of anvil. A stationary anvil support 14*a* carries a fitting 20*a* on which is mounted a relatively long thimble or sleeve 16*a*. An anvil plunger 17*a* is mounted for reciprocation in the sleeve 16*a* being held normally at the upper limit of its movement by a long compression spring 18*a*. The thimble 16*a* and the spring 18*a* are of such length that the spring 18*a* is capable of yielding with the desired readiness in the early part of the downward movement of the anvil plunger, but is capable of opposing sufficient yielding force to arrest the downward movement of the anvil plunger even when the operator applies the greatest force that be can to the driver. This form of machine is capable of producing greatly improved results over prior art machines, but is inferior to the machine of Figures 1 and 2.

In the appended claims we have referred to the machine as designed for setting jewels. The term "jewel" is not used in a limiting sense, however, but is intended to be representative of various ornaments and other objects which might be attached to garments or other sheet materials and which would be likely to be crushed or damaged by positive pressure exerted through them.

While we have illustrated and described in detail certain preferred forms of our invention, it is to be understood that changes may be made therein and the invention embodied in other structures. We do not, therefore, desire to limit ourselves to the specific constructions illustrated, but intend to cover our invention broadly in whatever form its principle may be utilized.

We claim:

1. In a jewel setting and attaching machine, in combination, an anvil support, a fitting secured thereto, a thimble secured to the fitting, an anvil plunger reciprocable in the thimble and projecting clear of the thimble through the upper end thereof, and a spring in the thimble supporting the anvil plunger in opposition to the driver, said plunger having a shoulder within the thimble for engaging the thimble to limit upward movement of the plunger.

2. In a jewel setting and attaching machine, in combination, an anvil support, a fitting secured thereto, a thimble secured to the fitting, an anvil plunger reciprocable in the thimble and projecting clear of the thimble through the upper end thereof, and a spring in the thimble supporting the anvil plunger in opposition to the driver, said plunger having a shoulder within the thimble for engaging the thimble to limit upward movement of the plunger, and said anvil plunger and fitting having aligned bores therethrough, the fitting bore being provided with a funnel-shaped mouth.

In testimony whereof we have affixed our signatures to this specification.

JOHN A. DEVENDOR.
WILLIAM A. DEVENDOR.