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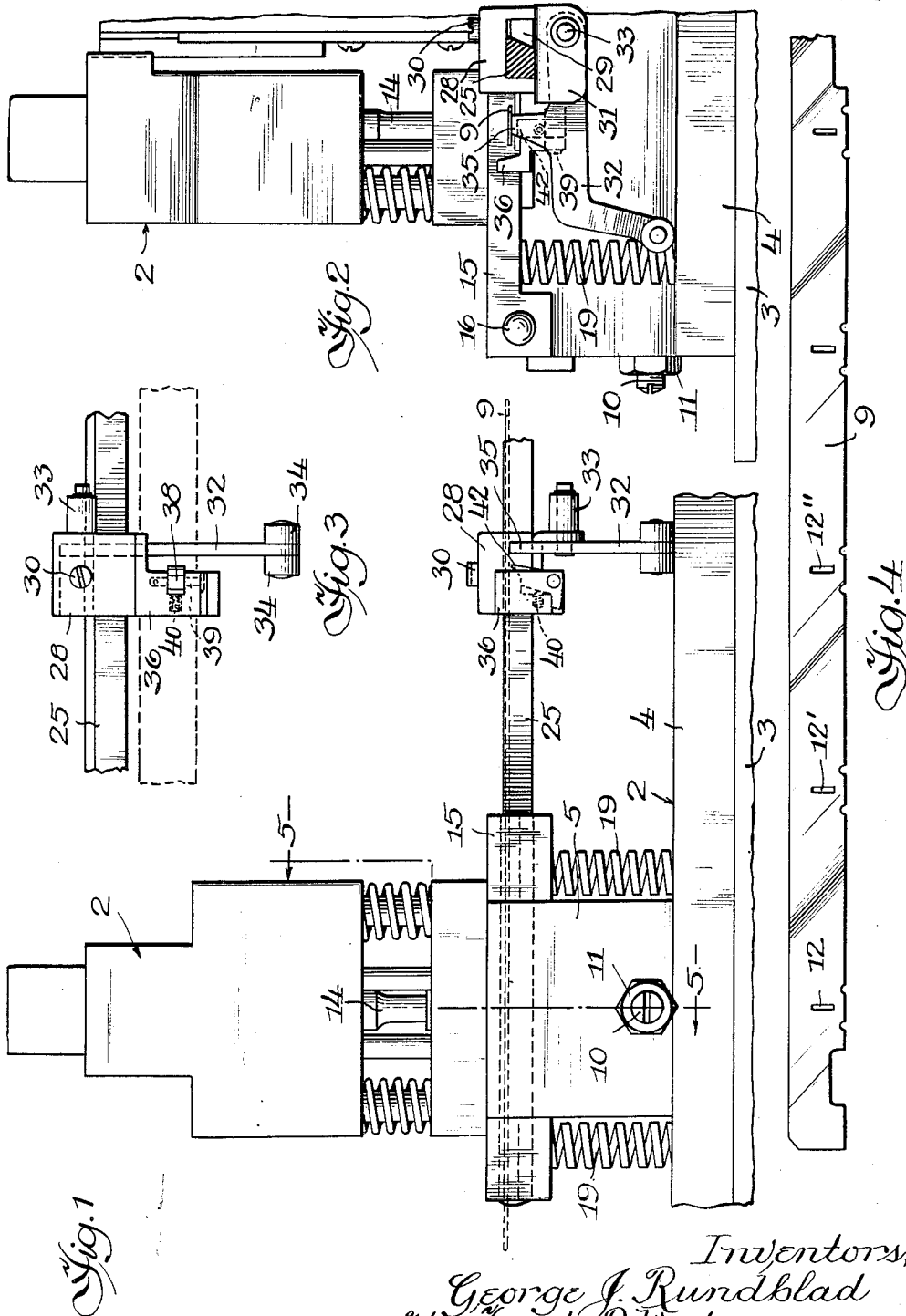
G. J. RUNDBLAD ET AL

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GAUGE FOR RING SETTING MACHINES

Filed Feb. 19, 1951

2 Sheets-Sheet 1



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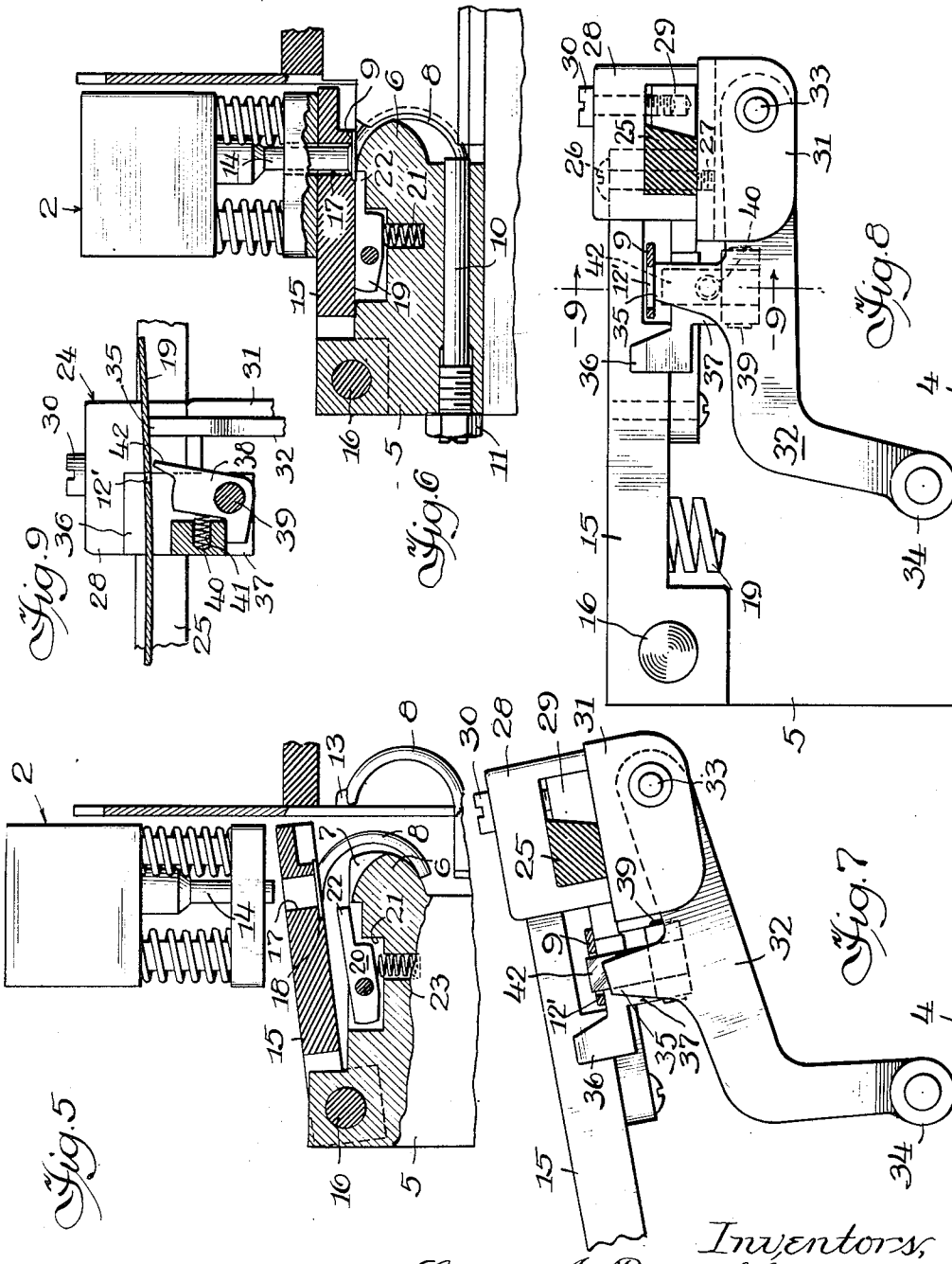
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UNITED STATES PATENT OFFICE

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GAUGE FOR RING SETTING MACHINES

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5 Claims. (Cl. 78—97)

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This invention relates to a gage for ring setting machines of the type disclosed in the co-pending application of Edward F. Buenger et al., filed January 30, 1948 under Serial No. 5,318, and refers particularly to the gage for holding the prong plate in proper position for setting the first ring. After one ring has been set, each ring that has been set in any prong plate cooperates successively with a stop member to gage the plate for setting the next succeeding ring on the same prong plate.

The gage mechanism for setting the first ring, as disclosed in the above identified application, has proved fairly satisfactory except that it slows up the ring setting process somewhat because it requires the use of both hands, and further requires that the operator observe the final engagement of the gage means with the prong plate before the operator can start the punch press operation.

In accordance with the present invention the prong plate is pushed into the press with one hand and the engagement of the prong plate with the gage mechanism is practically automatic so that the operator does not have to delay the stroke of the punch press to make certain that the prong plate is properly positioned for the ring setting operation.

It is the primary object of this invention to provide gage means that will accurately and positively position a prong plate in a punch press for the initial ring setting operation. It is a further object of the invention to provide such a gage that will not interfere with movement of the prong plate after the first ring has been set, so that the setting of successive rings of the same prong plate may be substantially continuous with successive strokes of the punch press. Other objects of the invention will become apparent upon reading the following description, taken in conjunction with the accompanying drawings, in which:

Figure 1 is a front elevation of the punch press and gage;

Figure 2 is a side elevation of the gage and associated punch press;

Figure 3 is a top plan view of the gage;

Figure 4 is a plan view of the prong plate into which rings are to be set;

Figure 5 is a cross sectional view, taken along the line 5—5 of Figure 1, showing the punch press immediately after the ring setting operation with the next ring ready to be positioned on the anvil for the succeeding ring setting operation;

Figure 6 is a cross sectional view showing the punch press in its ring setting position;

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Figure 7 is a side elevation of the gage holding the prong plate, shown in section, in position for the ring setting operation;

Figure 8 is a side elevation of the gage, with the prong plate in section, after the ring has been set; and

Figure 9 is a cross sectional view, taken along the line 9—9 of Figure 8.

In the drawings, the reference numeral 2 indicates a punch press having a bed 3 and a bolster plate 4 secured thereto. A setting die 5 secured in conventional manner to bolster plate 4 comprises a solid steel block having an integral anvil 6 projecting from its rear edge. The upper portion of the anvil is grooved, as indicated at 7, to receive the upper portion of a ring 8 which is to be set into a prong plate 9. As shown in Figure 6, the lower end of the ring is positioned by engagement with the end of a rod 10 threaded into the setting die and held in place by a nut 11.

The mechanism for positioning the successive rings 8 for the ring setting operation is fully disclosed in the above mentioned application of Buenger et al., and is not included in the present application.

The prong plate 9 is provided with a series of transversely extending slots 12, 12' etc., each of which is adapted to receive the headed end 13 of a ring 8. In the ring setting operation this headed end 13 is smashed flat against the prong plate by the punch head 14. A plate 15 pivoted to the setting die 5, as indicated at 16, is provided with an aperture 17 slightly larger than the diameter of punch head 14, and with a groove 18 extending entirely across the plate in which the prong plate is guided for the series of ring setting operations. A pair of springs 19 urges plate 15 upwardly so that when the punch press moves upwardly after each ring setting operation the plate 15 is raised about its pivot 16 to permit proper positioning of the ring 8 for the next setting operation. A stop member 20, pivoted in a recess 21 in setting die 5, has one end 22 urged upwardly by a spring 23 so that it abuts the upper end of ring 8 to hold it in proper position for the ring setting operation. The downward blow of the punch press forces plate 15 and stop member 20 downwardly, against the action of springs 19 and 23, so that neither interferes with the impact of punch 14 against the headed end 13 of ring 8.

The gage 24, which constitutes the subject matter of the present invention, is slidably mounted on a bar 25 rigidly secured to plate 15 by means of a bolt or bolts 26 secured in place by a nut 27. The bar 25 projects laterally from

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the plate 15 and the gage is adjusted to the desired lateral distance in advance of the punch head 14. The gage 24 includes a saddle member 28 secured to the bar 25 by means of a wedge block 29 and set screw 30. The saddle 28 serves as a supporting member for the rest of the gage structure. An L-shaped bracket 31 is rigidly secured to the saddle 28, and a bell crank 32 is pivoted to the bracket, as indicated at 33. The lower end of bell crank 32 rests on the bolster plate 4 and is provided with a pair of rollers 34 to prevent wear. The bell crank is provided with a projection 35 extending upwardly from its upper edge for a purpose hereinafter described.

A member 36, having a block-like section 37 depending therefrom, is rigidly secured to saddle member 28. An L-shaped lever 38, shown in Figure 9, is pivoted to section 37, as indicated at 39. A spring 40, seated in a recess 41 in section 37, exerts a constant force against lever 38 urging it towards the right, as seen in Figure 9. The lever 38 is provided with an upstanding finger 42 adapted to engage the slots 12.

The method of operating the gage 24 will now be described. The left hand end of a prong plate 9, as viewed in Figures 1 and 9, is positioned in groove 18 and moved laterally towards the left. As the prong plate is moved towards the left the right end must approach the same horizontal plane in which the left end is positioned, with the result that as the prong plate is moved towards the left it slides over the top of finger 42. Just before slot 12 is aligned with punch head 14 slot 12' engages the finger 42 and moves lever 38 to the left against the action of spring 40 until the lever abuts the edge of the recess in block 37 in which it is mounted. Block 37 acts as a stop member and prevents further lateral movement of the lever 38. In this position the punch 14 is positioned directly above the headed end 13 of ring 8 which projects through slot 12. The down stroke of the punch press 2 causes the punch head 14 to flatten the projecting portion of headed end 13 against the prong plate to set the ring 8 in place, and the downward pivotal movement of plate 15 causes the bell crank 32 to move about its pivot 33. This pivotal movement of the bell crank causes projection 35 to move upwardly, engaging prong plate 9 and tilting it upwardly far enough to disengage slot 12' from finger 42. As soon as prong plate 9 is tilted upwardly by the projection 35 spring 40 pushes finger 42 towards the right so that the prong plate may be moved towards the left until slot 12'' engages finger 42 and the cycle is repeated. A separate gage, which is fully described in the above identified application of Edward F. Buenger et al., is provided on the left side of the punch press, so that that the prong plate may be positioned properly for setting a ring in the slot 12 at the extreme right hand end of the prong plate.

Although we have described a preferred embodiment of our invention in considerable detail, it will be understood that the description is intended to be illustrative, rather than restrictive, as many details of structure may be modified or changed without departing from the spirit or scope of our invention. Accordingly, we do not desire to be restricted to the exact structure described, except as limited by the appended claims.

We claim:

1. In a ring setting machine, a punch press including a bed, a setting die supported on said

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bed, a pivoted plate positioned over said setting die and spring means normally urging said plate upward into tilted position, a bar extending laterally from said plate, a supporting member mounted on said bar, a lever pivoted to move laterally relative to said supporting member, said lever being engageable with a prong plate having one end positioned over said setting die, a stop member, said lever being movable laterally into engagement with said stop member to position said prong plate in predetermined position relative to said setting die, a bell crank pivoted adjacent said supporting member and having one arm supported on said bed, a projection extending upwardly from the other arm of said bell crank, said pivoted plate being movable downwardly against said setting die during the ring setting operation, said projection engaging said prong plate during said downward movement of said pivoted plate to disengage said prong plate from said lever, and means for automatically moving said lever out of registration with said aperture upon disengagement of said prong plate.

2. A gauge for positioning a prong plate in predetermined position in a punch press having a rigid bar extending laterally thereof, said gage comprising a supporting member slidably mounted on said bar, a lever pivoted to said supporting member, said lever being engageable with a prong plate in advance of the desired position and movable laterally therewith, stop means engaging said lever when said prong plate is in said predetermined position, a bell crank having one end pivoted relative to said supporting member and its other end in a fixed horizontal plane, and a projection on said bell crank positioned directly below said prong plate engaged by said lever, said supporting member, said lever, and the pivoted end of said bell crank being movable downwardly during the down stroke of said punch press, the fixed vertical position of said bell crank reducing the extent of the downward movement of said projection relative to the downward movement of said supporting member and said lever, whereby said projection engages said prong plate to disengage it from said lever during the down stroke of said punch press.

3. A gauge for positioning a prong plate in predetermined position in a punch press having a rigid bar extending laterally thereof, said gage comprising a supporting member slidably mounted on said bar, a lever pivoted to said supporting member, said lever being engageable with a prong plate in advance of the desired position and movable laterally therewith, stop means engaging said lever when said prong plate is in said predetermined position, a bell crank having one end pivoted relative to said supporting member and its other end in a fixed horizontal plane, a projection on said bell crank positioned directly below said prong plate engaged by said lever, said supporting member, said lever, and the pivoted end of said bell crank being movable downwardly during the down stroke of said punch press, the fixed vertical position of said bell crank reducing the extent of the downward movement of said projection relative to the downward movement of said supporting member and said lever, whereby said projection engages said prong plate to disengage it from said lever during the down stroke of said punch press, and a spring in constant engagement with said lever, said spring urging said lever laterally, whereby said lever is moved laterally to its initial position upon disengagement of said prong plate from said lever.

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4. A gauge for positioning an apertured prong plate in predetermined position in a punch press, said gage comprising a supporting member in laterally spaced relationship to said punch press, a stop member integral with said supporting member, a lever pivoted to said supporting member, a finger extending upwardly from said lever and engageable with an aperture in said prong plate, said lever being movable laterally into engagement with said stop member upon engagement of said finger with said aperture and subsequent manual lateral movement of said prong plate, a bracket mounted on said supporting member, a bell crank having one end pivoted to said bracket and its other end in a fixed horizontal plane, and a projection on said bell crank positioned directly below said prong plate engaged by said finger, said supporting member and said lever being movable downwardly during the down stroke of said punch press, said projection engaging said prong plate during the downward movement of said lever to disengage said prong plate from said finger.

5. A gage for positioning an apertured prong plate in predetermined position in a punch press, said gage comprising a supporting member in laterally spaced relationship to said punch press, a stop member integral with said supporting

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member, a lever pivoted to said supporting member, a finger extending upwardly from said lever and engageable with an aperture in said prong plate, said lever being movable laterally into engagement with said stop member upon engagement of said finger with said aperture and subsequent manual lateral movement of said prong plate, a bracket mounted on said supporting member, a bell crank having one end pivoted to said bracket and its other end in a fixed horizontal plane, a projection on said bell crank positioned directly below said prong plate engaged by said finger, said supporting member and said lever being movable downwardly during the down stroke of said punch press, said projection engaging said prong plate during the downward movement of said lever to disengage said prong plate from said finger, and a spring engaging said lever, said spring urging said lever laterally to move said finger out of registration with said aperture upon disengagement of said prong plate from said finger.

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