

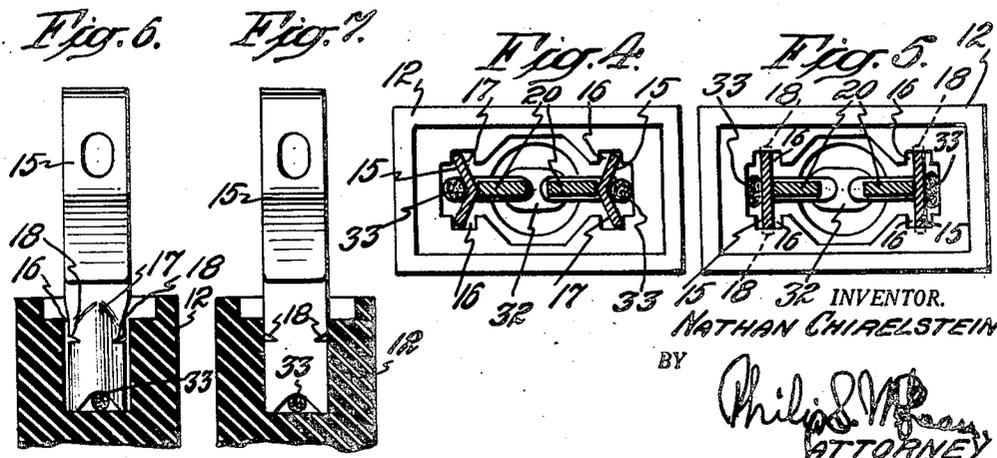
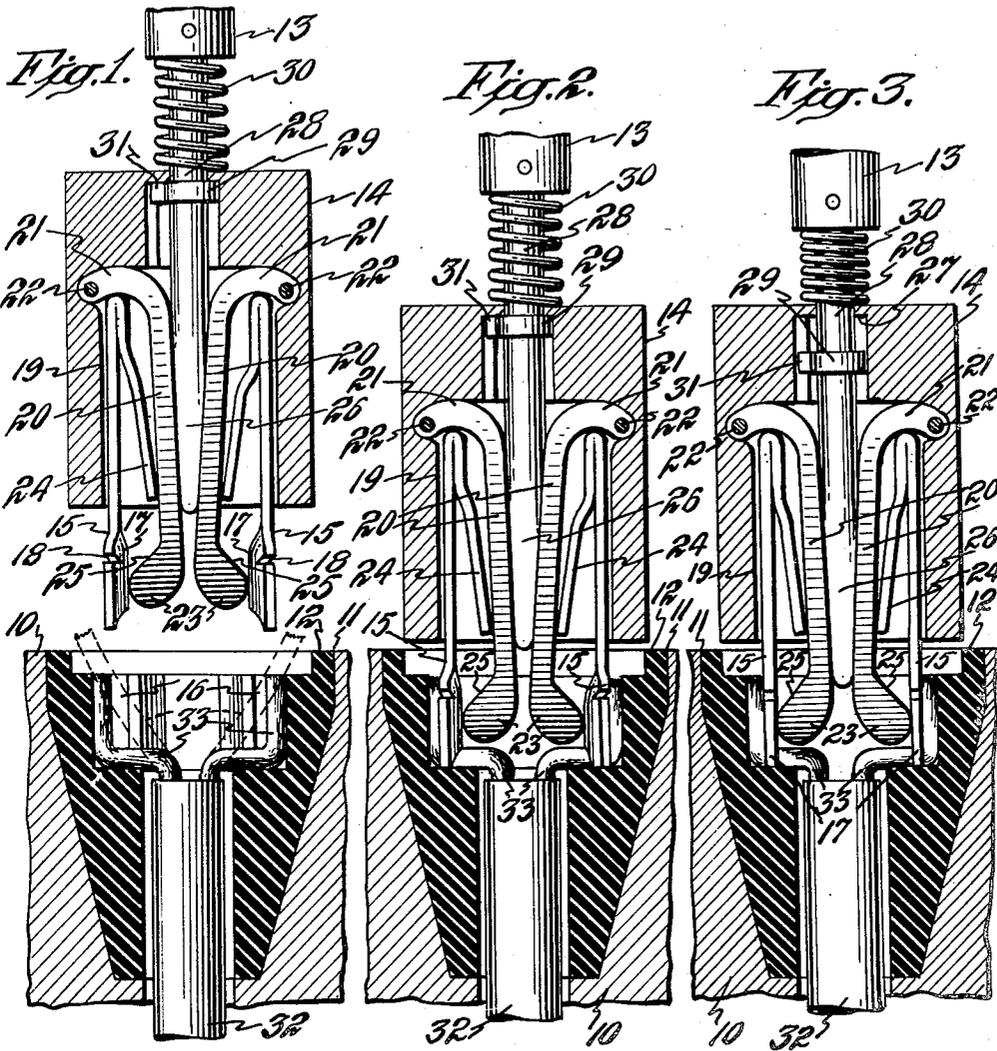
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APPARATUS FOR ASSEMBLING ATTACHMENT PLUGS

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APPARATUS FOR ASSEMBLING ATTACHMENT PLUGS

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2 Claims. (Cl. 29—206)

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The invention herein disclosed relates to apparatus for locating and interlocking the contact blades in the base or body portions of attachment plugs, and is a division of patent application Serial No. 642,729, filed January 22, 1946, and now matured into Patent Number 2,473,570, granted June 21, 1949.

Objects of the invention are to provide simple and practical mechanism for placing the two blades of an attachment plug in position in a plug body and for then operating on the blades to simultaneously expand and permanently lock them in position in the plug base.

Particularly it is a purpose of the invention to accomplish the securing of the plug blades without driving or forcing them into position in the plug body, and yet in the end to effect positive interlock of the blades in the material of the cap.

Other desirable objects and the novel features of construction, combination and relation of parts through which the purposes of the invention are attained, are set forth or will appear in the course of the following specification.

The drawing accompanying and forming part of the specification illustrates a present commercial embodiment of the invention. Structure, however, may be modified and changed as regards the immediate illustration, all within the true intent and broad scope of the invention as hereinafter defined and claimed.

Fig. 1 in the drawing is a broken sectional view showing the blades of an attachment plug placed in the assembly head of the mechanism and ready to be inserted in the plug base;

Fig. 2 is a similar view showing the head lowered to locate the blades loosely in the plug body;

Fig. 3 is a like view showing the spindle of the machine further lowered to cause the spreading levers to expand the root portions of the blades into interlocked engagement with the walls of the plug body;

Figs. 4 and 5 are horizontal sectional views on substantially the planes of lines 4—4 of Fig. 2 and 5—5 of Fig. 3, illustrating the effect of flattening the bowed sections of the blades to expand them into interlocked engagement in the seats;

Figs. 6 and 7 are vertical sectional views substantially on lines 6—6 and 7—7 of Figs. 2 and 3, illustrating the expanding and interlocking effect.

The machine illustrated comprises a base or bed 10 having a nest or cavity 11 for receiving and supporting a plug body 12, and a plunger or spindle 13 having a head 14 for placing the blades 15 in seats or cavities 16 and then expanding them into engagement with the walls of such cavities.

In preparation for such operations the inner

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or root end portions of the blades, in the illustration, are bowed transversely at 17 to render them of less transverse width than the sockets 16, as shown particularly in Figs. 4 and 6.

Interlocking engagement with the walls of the recesses is effected by flattening these preformed, bowed portions of the blades and thereby expanding in the nature of a toggle to force the edge portions into firm gripping engagement with the opposite side walls of the recesses, substantially as indicated in Figs. 5 and 7.

To further effect a strong mechanical interlock between the edges of the blades and the walls of the recesses in which they are seated, one or both of the opposing side edges of the blades may be burred, toothed, serrated, roughened or nicked, substantially as indicated at 18, to provide more or less sharp cutting edges which with the transverse expansion of the blades will be forced to cut transversely into the surrounding material of the plug base, in the manner indicated in Fig. 5.

To hold the blades aligned with the sockets or seats 16, the head 14 is formed with a cavity 19 deep enough to receive the outer end portions of the blades and shaped to position them loosely in the spaced relation indicated in Fig. 1.

The blades are lightly retained in this positioned relation by a pair of spreader levers 20 disposed between the blades and having outwardly angled, upper end portions 21 overstanding the upper ends of the blades and pivoted in the side portions of the head at 22.

The lower ends of the levers have outwardly angled cam portions 23 positioned to bear against the inwardly convexed sections of the blades and designed, as the levers are separated, to flatten and restore such portions to the original, flat, full dimensional sizes of the blades.

The blades shown are what is known in the trade as of the "Spring Action" type having introverted, reversely bent, spring end portions 24 which, as shown in Fig. 1, may bear against the edges of the spreaders above the spreading cams 23. These reversely bent spring tongues on the ends of the blades thus may assist in yieldingly holding the blades in the socket 19 in the head 14.

The upper or inner sides of the cams 23 are shown as inclined at 25 to slide freely up over the ends of the spring tongues as the head is withdrawn after expanding and anchoring the blades in the cap base.

The spreading of the levers 20 is effected, in the illustration, by means of a wedge 26 disposed between the inner edges of the levers and having movement in the head independently of the levers.

The latter condition is achieved by slidably mounting the head at 27 on the reduced spindle

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extension 28 of the plunger 13 in back of stop shoulder 29 and by interposing an expansion spring 30 between the back of the head and the end of the plunger 13. Further, the head may be slidably keyed on the spindle, as indicated at 31, to maintain the head in proper alignment with the plug body seated in the base.

The plunger 13 may be the arbor of a punch press or a part adapted to be mounted on the spindle or plunger of such a press.

In any event, the stroke of the reciprocating member 13 is sufficient to carry the head far enough away from the base for a pair of the blades to be inserted in the head at the sides of the spreader levers, as in Fig. 1, and to then lower the blades into their seats 16, as in Fig. 2, and finally to advance the wedge 26, as in Fig. 3, to cause the spreader cams to flatten out the bowed or transversely arched portions of the blades into interlocked engagement with the walls of the recesses.

Usually, after placing a plug cap in the nest 11 provided for it in the base, the wire may be entered by passing the cord 32 up through the bottom of the base and spreading the wires 33 to opposite sides over the blade seats 16. Then, as the head lowers to the first position shown in Fig. 2, the upper, outwardly arched ends 21 of the lever will thrust the blades down over the wires, bending them up at the backs or outer sides of the blades, substantially as shown in this view.

With further downward motion of the head stopped by reason of the angled levers having thrust the blades all the way to the bottom of their recesses, Fig. 2, further motion of the punch spindle, compressing the spring 30, will carry the wedge 26 downward as in Fig. 3, to separate or spread the lower cam ends of the levers, causing them to flatten out the arches and transversely expanding the root portions of the blades, as in Figs. 5 and 7.

On the upward or retractive movement of the spindle the spring 30 will expand, causing the upper end of the head to again engage the shoulder 29 which then picks up the head and pulls it upwardly over the blades impaled in the plug body. In such upward movement, with the lifting of the wedge 26, the spreader levers can more nearly approach each other, as in Fig. 2, thus to more readily pass back up over the spring ends 24 of the blades, the inclines 25 on the upper edges enabling the cams to slide freely upwardly over the yielding spring ends of the blades.

The machine is of simple, rugged construction and can be operated rapidly, by motor or foot power, for example, to set or loosely locate the blades and then to expand them into positively and firmly interlocked engagement in the seats in the caps. By applying the expanding force in opposite directions against oppositely located blades, both blades of a plug can be simultaneously fastened in place and in so doing the expanding forces are equalized and distributed so as to avoid undue or localized strains which otherwise might fracture or weaken the plug cap, particularly where the cap is of hard, brittle, frangible material.

What is claimed is:

1. A machine for assembling attachment plugs comprising a machine bed having a nest for a plug cap, a spindle operable toward and away from said nest, a spreader wedge on the end of said spindle, a head slidably mounted on the end portion of said spindle over said wedge in posi-

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tion to be stopped by engagement of the end of the same with said nest, said head having blade holding cavities in the end of the same at opposite sides of said wedge, spreader levers pivoted at their inner ends at the inner ends of said blade holding cavities and disposed in engagement with opposite sides of said wedge, the outer ends of said levers projecting beyond the end of said head and terminating in laterally projecting cams, a stop on said spindle for limiting the outward movement of said head over said wedge and a spring on the spindle for thrusting said head outward on the spindle to the extent permitted by said stop whereby in the movement of the head toward the nest said projecting cam portions may enter the blade receiving pocket of a plug cap seated in said nest and whereby in the further movement of said spindle after said head has been stopped by engagement of the end of the same with said nest, the wedge continuing with the motion of the plunger will spread the levers apart to force said projecting cam portions into operative engagement with the base portions of blades carried by the head into seated engagement in a plug cap supported in the nest.

2. A machine for assembling attachment plugs comprising a machine bed having a nest for a plug cap, a spindle operable toward and away from said nest, a spreader wedge on the end of said spindle, a head slidably mounted on the end portion of said spindle over said wedge in position to be stopped by engagement of the end of the same with said nest, said head having blade holding cavities in the end of the same at opposite sides of said wedge, spreader levers pivoted at their inner ends at the inner ends of said blade holding cavities and disposed in engagement with opposite sides of said wedge, the outer ends of said levers projecting beyond the end of said head and terminating in laterally projecting cams, a stop on said spindle for limiting the outward movement of said head over said wedge and a spring on the spindle for thrusting said head outward on the spindle to the extent permitted by said stop whereby in the movement of the head toward the nest said projecting cam portions may enter the blade receiving pocket of a plug cap seated in said nest and whereby in the further movement of said spindle after said head has been stopped by engagement of the end of the same with said nest, the wedge continuing with the motion of the plunger will spread the levers apart to force said projecting cam portions into operative engagement with the base portions of blades carried by the head into seated engagement in a plug cap supported in the nest and said spreader levers having angled inner end portions extending laterally over the inner ends of the blade holding cavities serving as stops for blades entered in said cavities and for positioning the blades in said cavities with the cam portions of the levers lined up with the base portions of the blades so located in the cavities.

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