No. 643,346. Patented Feb. 13, 1900.

G. J. CAPEWELL, JR.

STICK PIN RETAINER.

(Application filed Nov. 15, 1899.)

(No Model.)

Fig. 1

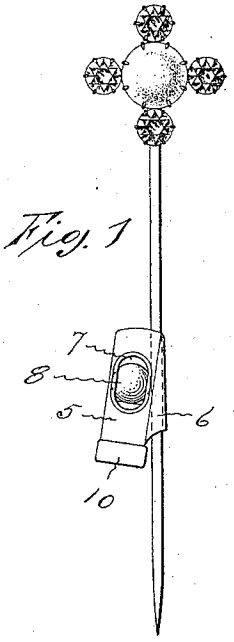


Fig. 3

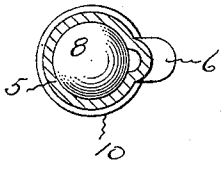


Fig. 4

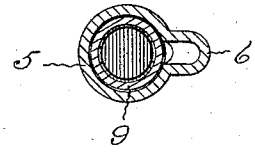
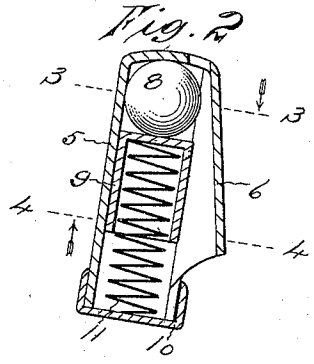


Fig. 2



Witnesses:

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UNITED STATES PATENT OFFICE.

GEORGE J. CAPEWELL, JR., OF HARTFORD, CONNECTICUT.

STICK-PIN RETAINER.

SPECIFICATION forming part of Letters Patent No. 643,346, dated February 13, 1900.

Application filed November 15, 1899. Serial No. 737,109. (No model.)

To all whom it may concern:

Be it known that I, GEORGE J. CAPEWELL, Jr., a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Stick-Pin Retainers, of which the following is a specification.

This invention relates to those retainers which freely receive a pin, but which automatically clamp and restrain the removal of a pin that they have received.

The object of the invention is to provide a simple, cheap, and small article of this nature which is easy to manipulate and which will hold a pin very securely.

The embodiment of the invention illustrated by the accompanying drawings has a shell formed of two tubular parts of different diameters located side by side at an angle, so as to communicate with each other, and the larger of the tubular parts containing a clamping-ball, a plunger, and a spring, which causes the plunger to force the ball toward the point of convergence of the tubular parts.

Figure 1 of the drawings is an enlarged side view showing a retainer in use. Fig. 2 shows a longitudinal section on still larger scale. Fig. 3 shows a transverse section looking down on the plane indicated by the broken line 3 3 of Fig. 2, and Fig. 4 shows a transverse section looking up on the plane indicated by the line 4 4.

The shell of this retainer may be made as ornate as desired, of brass and plated or of silver or gold. This shell may be drawn or stamped so as to form the tubular part 5 of one diameter and the tubular part 6 of considerably smaller diameter. These tubular parts are joined so as to extend at an angle with each other, and the chambers in their interiors communicate along the edge of junction. At the apex or end where the smaller merges into the larger an opening is made into the tubular part 6 for a pin, and at the other end this tubular part opens to allow the pin to be thrust through. The interior diameters of the chamber in this tubular part 6 and of the openings through the end are substantially the size of the diameter of the pins with which the retainer is to be used for safety purposes.

The tubular part 5 is closed at both ends, but has an opening 7 in one side. In this tubular part 5 is located a ball 8, that is preferably formed of steel of a diameter that is slightly smaller than the diameter of the chamber in this part. Beneath the ball in the tubular part 5 is a hollow plunger 9, and thrusting between the hollow plunger and the cap 10, that closes the lower end of this tubular part, is a spring 11. This spring thrusts the plunger upwardly and normally forces the ball toward the apex end, so as to not only fill the chamber in the tubular part 5, but also to extend into and occupy a portion of the chamber in the tubular part 6. A pin thrust into the opening in the upper end of the tubular part 6 causes the ball to roll before it, forcing down the plunger and compressing the spring until the passage through the tubular part 6 is sufficiently large to allow the easy insertion of the pin. The spring-plunger readily yields for this purpose, and as the ball rolls down the chamber in the tubular part 5 it is directed farther and farther from the diverging chamber in the tubular part 6. The spring, however, holds the ball closely against the pin, and when any strain in an upward direction is brought upon the pin the friction between the pin and the ball causes the latter to roll upwardly into a space that is smaller on account of the convergence of the chambers in the tubular parts. In this manner the ball securely clamps the pin against the wall of the tubular pin-chamber and prevents its withdrawal outwardly.

To remove the pin, it is necessary to hold the ball from outward movement by the thumb or finger, and thus prevent its clamping the pin. As the tubular parts are inclined toward each other at a small angle, the wedging of the ball when rolling outwardly toward the smaller space causes an exceedingly-strong bite to be placed upon the pin. Yet the pin is easily thrust into the holder and can be easily removed by holding the ball from outward movement. This retainer is made quite small and on account of its form is very strong, so that while it can be made cheap it is efficient.

I claim as my invention—

1. A pin-retainer consisting of a shell having tubular chambers extending at an angle and communicating with each other, one of

said chambers opening at both ends, a ball loosely located in one chamber, and a spring arranged to thrust the ball toward the point of convergence of the chambers, substantially as specified.

2. A pin-retainer consisting of a shell having tubular chambers extending at an angle and communicating with each other, one of said chambers opening at both ends, a ball located in one chamber, and a spring arranged to thrust the ball toward the point of convergence of the chambers, substantially as specified.

3. A pin-retainer consisting of a shell having tubular chambers extending at an angle and communicating with each other, one of said chambers being smaller than the other and open at both ends, a ball located in the larger chamber, and a spring arranged to thrust the ball toward the point of convergence of the chambers, substantially as specified.

4. A pin-retainer consisting of a shell having tubular chambers extending at an angle and communicating with each other, one of said chambers being smaller than the other and opening at both ends, a ball located in the larger chamber, a plunger placed beneath the ball, and a spring arranged to thrust the ball toward the point of convergence of the chambers, substantially as specified.

5. A pin-retainer consisting of a shell having a chamber that is larger at one end than the other, openings through the ends of the shell near the edge, an opening through the side of the shell, a ball located within the shell, a plunger placed below the ball, and a spring adapted to thrust the plunger and ball toward the smaller end of the chamber in the shell, substantially as specified.

6. A pin-retainer consisting of a shell having tubular chambers extending at an angle and communicating with each other, one of said chambers having an opening for the insertion of the pin, a ball free to roll in the other chamber, and a spring arranged to thrust the ball toward the point of convergence of the chambers, substantially as specified.

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Witnesses:
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