

No. 867,943.

PATENTED OCT. 15, 1907.

W. H. BOLES.

PIN AND SOCKET FASTENER.

APPLICATION FILED NOV. 8, 1906.

2 SHEETS—SHEET 1.

Fig: 1.

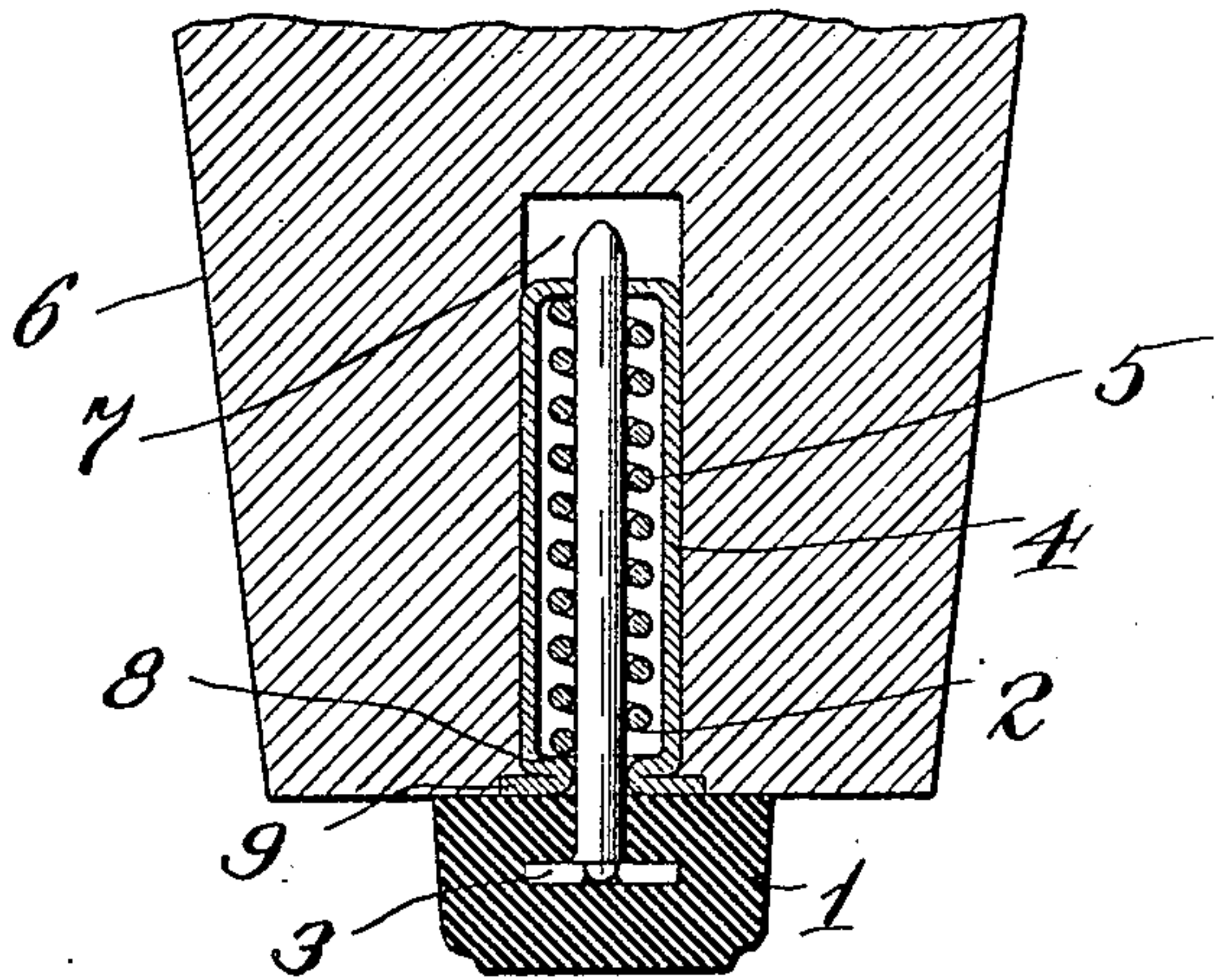


Fig: 2.

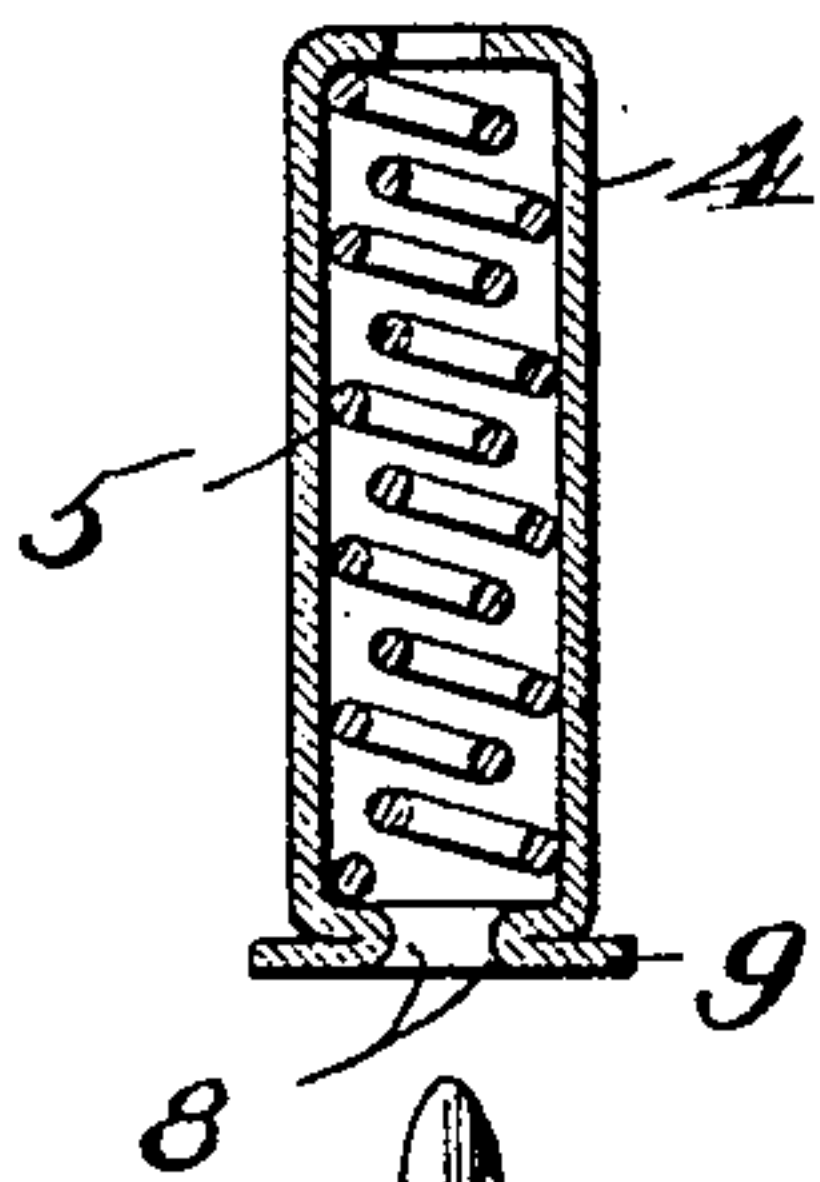


Fig: 5.

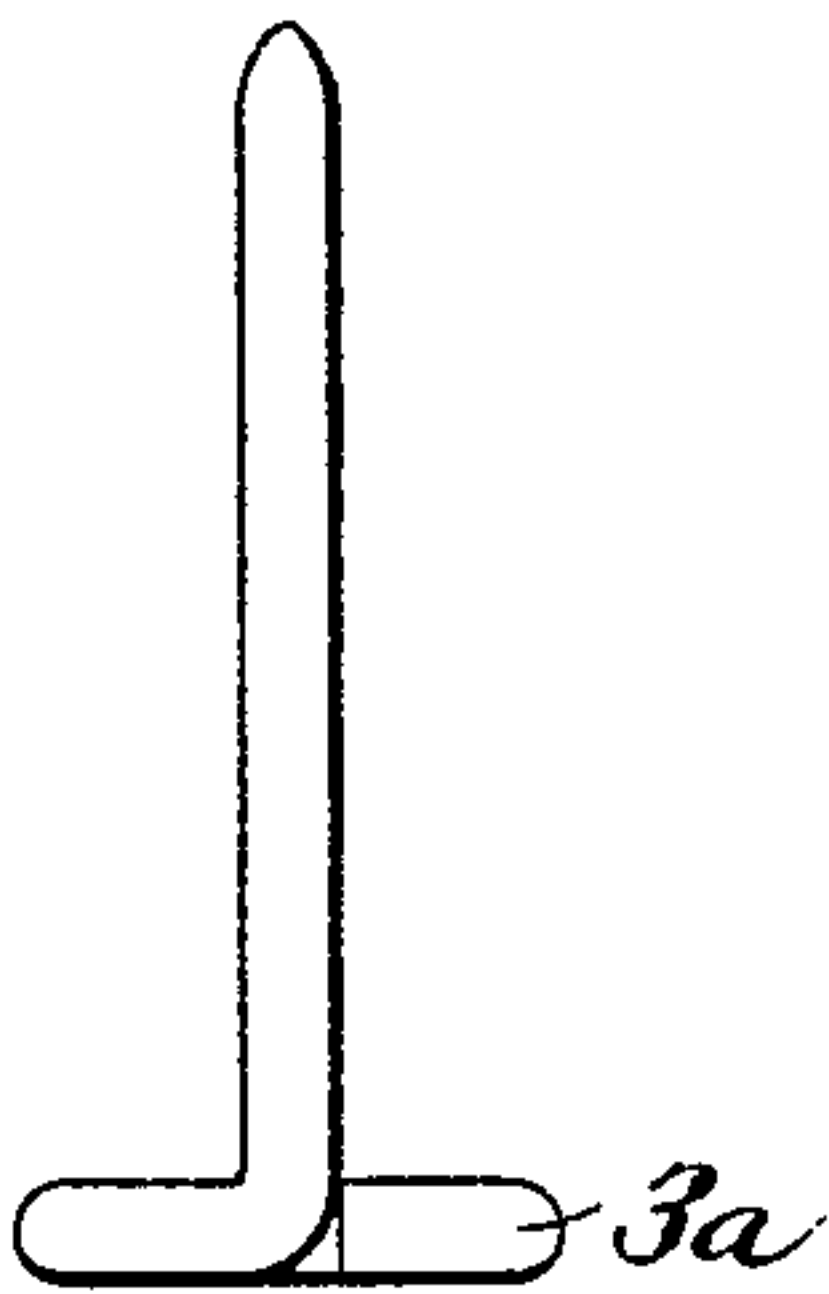


Fig: 3.

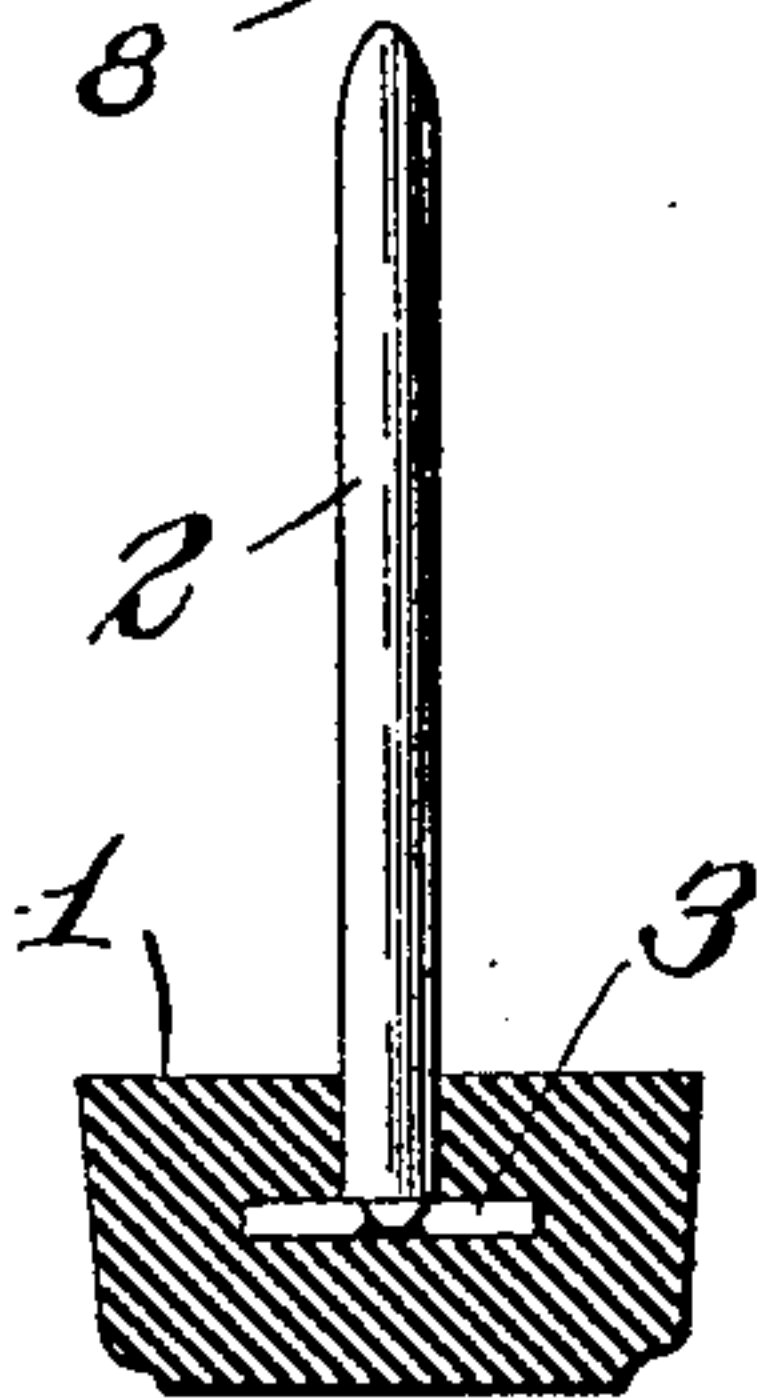
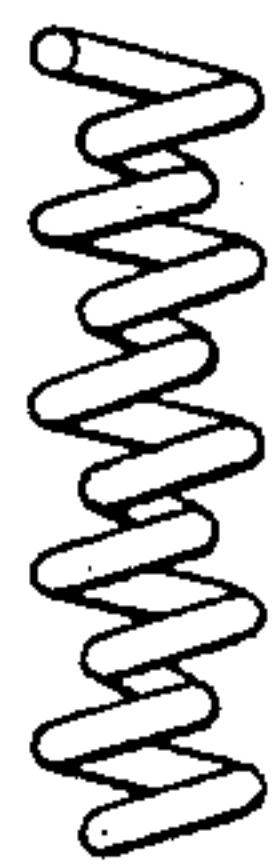


Fig: 6.



Fig: 4.



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INVENTOR

Warren H. Boles

BY

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ATTORNEYS

24. BUCKLES, BUTTONS, CLASPS, ETC.
 Separable fasteners,
 Head & socket,
 Axial closures.

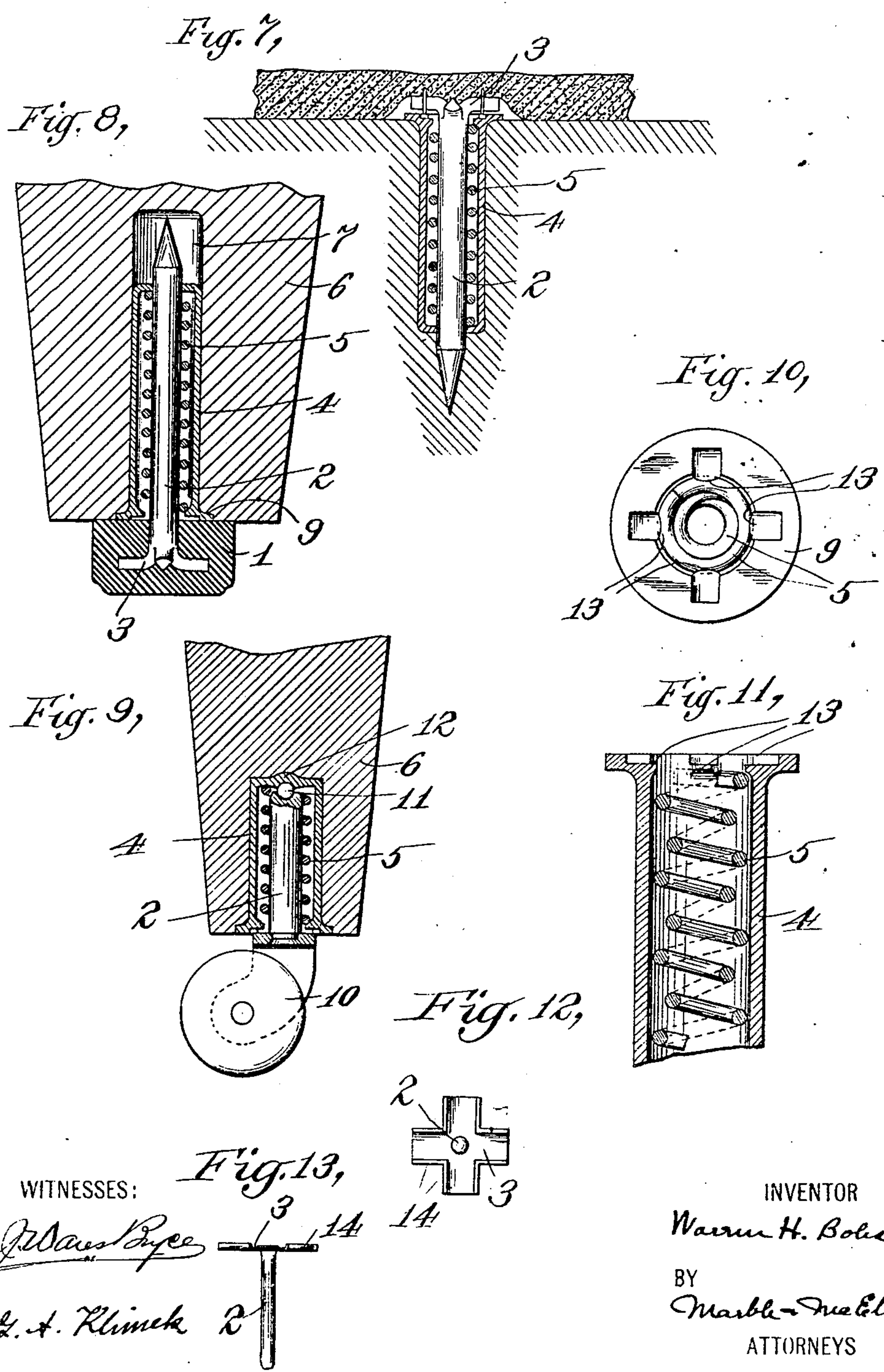
Draftsman.

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

WARREN H. BOLES, OF NEWARK, NEW JERSEY, ASSIGNOR TO BOLES FRICTION FASTENER COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PIN-AND-SOCKET FASTENER.

No. 867,943.

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed November 8, 1906. Serial No. 342,517.

To all whom it may concern:

Be it known that I, WARREN H. BOLES, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain
5 new and useful Improvements in Pin-and-Socket Fasteners; and I do hereby declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the same.

10 My invention relates to pin-and-socket fasteners, particularly those classes thereof adapted for use as carpet fasteners or for use in connection with furniture casters, furniture tips, etc.

My invention consists in the construction of said
15 fastener, and particularly of the socket and spring thereof.

The objects of my invention are to improve and simplify pin-and-socket fasteners; to provide improved means for frictionally grasping and holding in place the
20 pins of such fasteners; to make the friction holding device of such fasteners self-cleaning; to improve the shell or casing of such fasteners; and generally to make the device simple, efficient, durable, and easy to make.

25 In the accompanying drawings I illustrate my said fastener employed as a furniture-tip fastener, as a carpet fastener, and as a caster-retainer; these being certain of the uses to which the invention is applicable.

In said drawings: Figure 1 shows a vertical section of
30 one form of furniture tip and pin-and-socket fastener therefor in place on an article of furniture; Fig. 2 shows a longitudinal section of the socket and its spring gripping device, and of the cushion of the tip, the pin being shown withdrawn from the socket; Fig. 3 is a detail elevation of the spring gripping device; Fig. 4
35 shows a top view of one form of pin head; Figs. 5 and 6 are respectively an elevation and top view of a pin having an alternative form of head; Fig. 7 shows in vertical section the pin-and-socket fastener employed
40 as a carpet fastener; Figs. 8 and 9 show similar sections of fasteners employed in connection with furniture tips and with furniture casters respectively; Figs. 10 and 11 are respectively a top view and a central section of a socket having alternative means for holding the
45 spring in place; and Figs. 12 and 13 are respectively a top view and a side view of a pin having an alternative form of head.

Referring now to the accompanying drawings, and at first to Figs. 1—6 inclusive, 1 designates the cushion
50 of the said furniture tip, 2 a pin having a head 3 embedded in such cushion 1, and 4 a socket adapted to receive said pin and having within it an elastic gripping or retaining device comprising a spiral spring 5. The pin 2 and socket 4 having within it the gripping device 5 together constitute a pin-and-socket fastener,

adapted also for various other uses, as for example, carpet fasteners, caster sockets and the like. 6 designates an article to which the furniture tip is applied, the socket of said tip being set within a recess 7 of such article.

The cushion 1 is commonly formed of some flexible yielding or compressible material, such for example, as rubber, felt or the like. When formed of rubber the head 3 of the pin is commonly embedded in the material as shown in Figs. 1 and 2, during the molding of said
60 cushion. Such a yielding, elastic or compressible cushion will yield or compress to a variable degree, within limits, according to the pressure to which it is subjected. The fastening device for holding said cushion in place must yield in an exactly corresponding degree, otherwise
70 practically the entire pressure will be brought upon the fastening device itself—said device being thereby subjected to far greater stresses than it is intended to withstand. The fastening device must also permit reexpansion of the cushion when the pressure thereon is re-
75 lieved, otherwise said cushion will be held permanently in compressed condition, and so will become substantially rigid—which not only defeats the main purpose for which the cushion is employed, but causes the cushion to wear out or give way very soon. It is further
80 essential that the holding device for the cushion, while permitting reexpansion of the latter, shall exert continuously, retarding influence upon such reexpansion, otherwise the furniture tip and its attached parts may
85 “pop out” of the socket owing to the sudden expansion of the cushion. All these conditions are fully satisfactory by the form of fasteners shown in the drawings, in which the spiral spring 5 permits entrance of the pin into the socket to any desired extent, gripping the pin
90 at any point at which the latter may come to rest, by permitting reexpansion of the cushion, when the pressure thereon is relieved, and consequent partial withdrawal of the pin 2, said spring nevertheless exerting a retarding braking influence upon the pin, so as to prevent too rapid withdrawal thereof and thereby to pre-
95 vent the cushion and pin from “popping out”. The head 3 of the pin is of some shape such that it cannot turn within the cushion, as for example a bar (Fig. 6) or a cross (Figs. 4, 12 and 13), and preferably is so formed as not to cut off from each other the portions of
100 the main body of the cushion which are on opposite sides of said head; practically equal compression of the material on both sides of the head so being insured. This is quite important, particularly in the case of rubber and similar materials, which, as well known, yield,
105 not by real compression, but by deformation or change of shape; for a piece of rubber if compressed in one direction, takes up the compression by swelling or expanding in another direction, and unless permitted to so expand, is one of the most rigid and incompressible of sub-
110

stances. Unless all portions of the cushion can deform or change shape in substantial harmony, local stresses are set up which are apt to limit greatly the life of the cushion.

I have found a spiral spring such as 5 an especially efficient device for gripping a cylindrical or like surface, such as that of the pin 2, for the tension of the coils causes each coil to tend to contract individually, each turn of the spring therefore gripping the pin, and accommodating itself to the minute differences of size, form, etc., which are inevitable in commercial manufacture, and which prevent equivalent contact between such a pin and any other type of metal sleeve with which I am acquainted. The internal diameter of the spring is, of course, slightly less, when the spring is relaxed, than the diameter of said pin, so that the pin, when inserted within the spring, must expand the latter, thus placing the several coils of the spring under tension.

In another application for Letters Patent, filed November 23, 1904, Sr. No. 233,939, I have described and claimed a pin and socket fastener comprising a spiral spring holding device. The fastener shown in the drawings of this case embodies the invention of that application, and also an improvement thereon, illustrated particularly in Figs. 2 and 3. Said improvement consists in offsetting certain of the coils of the spring relative to other coils of the spring so as to give the spring what may be called a "staggered" form, when the spring is relaxed. This is illustrated in Figs. 2 and 3, in which alternate coils of the spring are so staggered. These coils occupy such staggered positions only when the spring is relaxed; for the pin, when inserted into the socket, draws the coils into line. By so staggering the coils, the pressure of the coils against the pin is greatly increased, and, what is exceedingly important, the lateral movement of the several coils relative to each other, causes any dirt which may have collected between the coils, to work out and fall away. Thereby the coils are made self cleaning—a very important feature.

For holding the spring in place within the socket, I have shown said socket provided with an internal shoulder 8 formed by crimping in the walls of the shell. The walls of the shell are spread immediately above the crimp so as to form a flange 9 which prevents the socket entering too far into the recess 7. The spring so held is perfectly free to turn within the socket shell, which in turn permits rotation of the cushion with respect to the chair leg, table leg, or other article to which it may be attached, thus avoiding twisting stresses on the material to be cushioned while moving the chair, table, or other article.

One form of pin head particularly suitable for use in these devices, is shown in Fig. 4, said head being formed by spreading the pin longitudinal for a portion

of its length into four practically equal parts and then spreading these parts out laterally. An alternative form of head is shown in Figs. 12 and 13, in which the head, though of cross form, is stamped from sheet metal, the pin being riveted to it. A further alternative form of head is shown in Figs. 5 and 6, the head there shown being formed by bending the material of the pin laterally and then back upon itself twice so as to bring the end of the wire adjacent to the first bend.

My pin-and-socket fastener is applicable in many connections other than with furniture tips. In Fig. 7 I have shown it employed as a carpet fastening device, the socket 4 being sunk into a floor. The forms of head shown in Figs. 4 and 12 and 13 are particularly suitable for carpet fasteners, since they may be stitched to the underside of the carpet or rug, and thus do not show above same. The sheet-metal head shown in Figs. 12 and 13 has raised flanges 14 forming rounded edges which avoid any tendency to cut the threads.

In Figs. 7—11 inclusive I also illustrate alternative means for holding the spring 5 in place within the socket. After the spring has been inserted within the socket, lugs 13 are pressed out from the material of the socket, by means of a suitable die, and these lugs project out over the top of the spring far enough to prevent its withdrawal. In Fig. 8 I show this form of socket employed in connection with a furniture tip, and in Fig. 9 I show same employed as a caster socket, the pintle of the caster being the pin which enters and is held by said socket. In this latter figure, I show the end of the caster pintle and the end 12 of the socket correspondingly recessed to receive a bearing ball 11, through which the load is transmitted to the caster, the horns of the caster having merely a steady bearing on the end of the socket.

What I claim is:—

1. A pin and socket fastener comprising in combination a socket, a pin and a spiral spring within said socket adapted to receive said pin within it and having coils of substantially the same diameter, certain of which are offset with respect to certain others. 95
2. A pin and socket fastener comprising in combination a socket, a pin and a spiral spring within said socket adapted to receive said pin within it and having staggered coils. 100
3. A socket for socket and pin fasteners, comprising a shell and a retaining keeper for a pin comprising a spiral spring having coils of substantially the same diameter, certain of which are offset with respect to certain others. 105
4. A socket for socket and pin fasteners, comprising a shell and a retaining keeper for a pin comprising a spiral spring, having staggered coils.

In testimony whereof I affix my signature, in the presence of two witnesses.

WARREN H. BOLES.

Witnesses:

ROGER H. LYON,
H. M. MARBLE.