

No. 815,212.

PATENTED MAR. 13, 1906.

J. R. POWELL.  
SQUIB HOLDER.

APPLICATION FILED MAY 10, 1905.

FIG. 1.

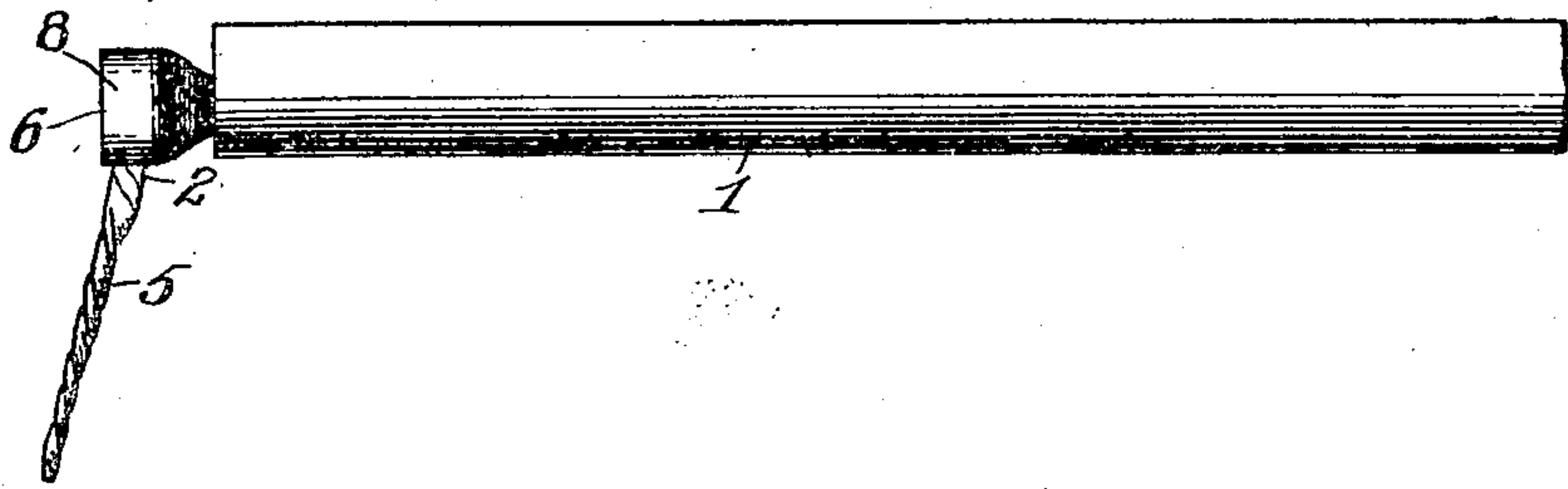


FIG. 2.

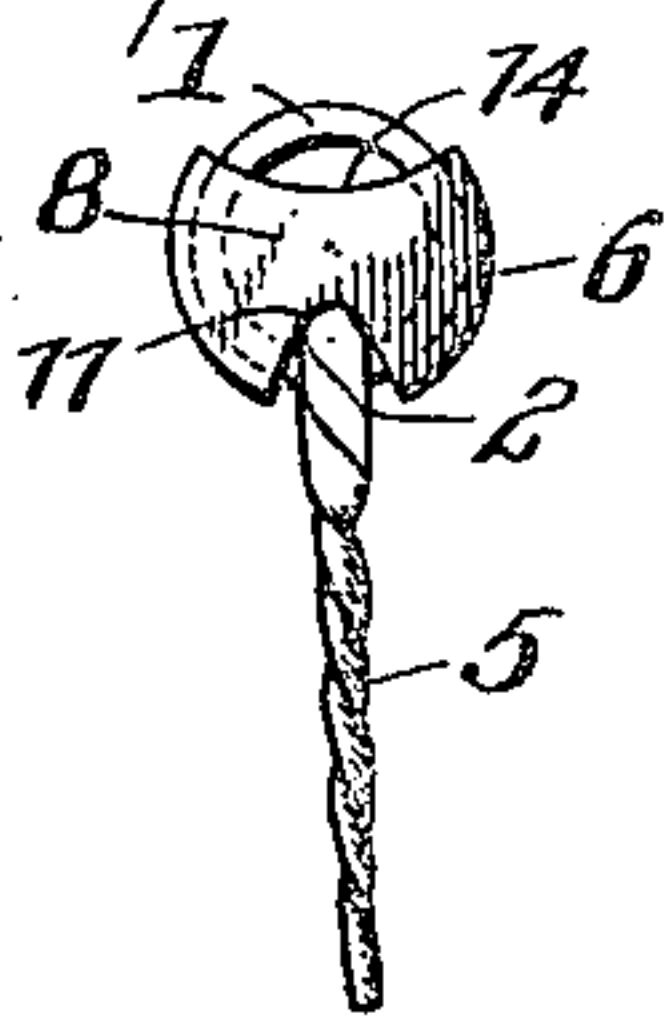


FIG. 3.

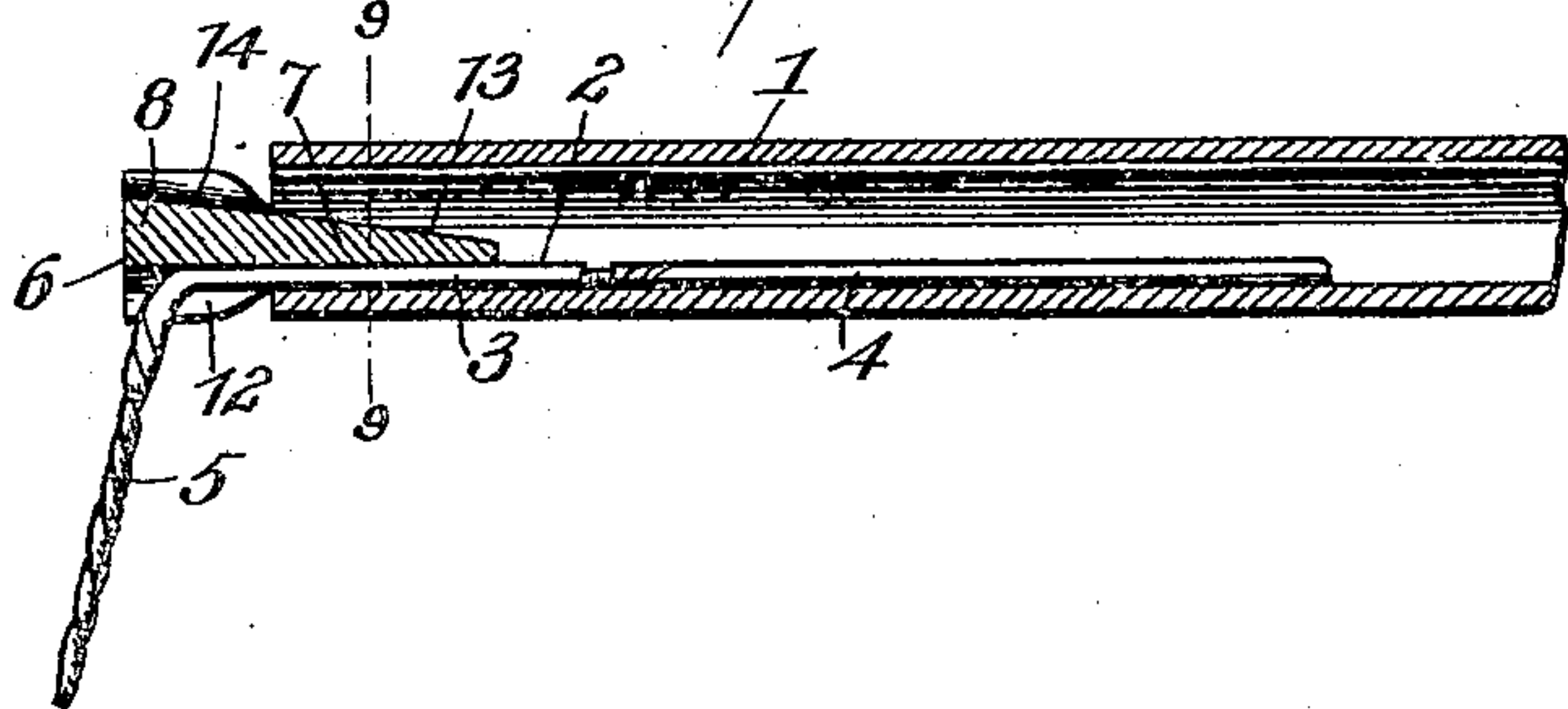


FIG. 4.

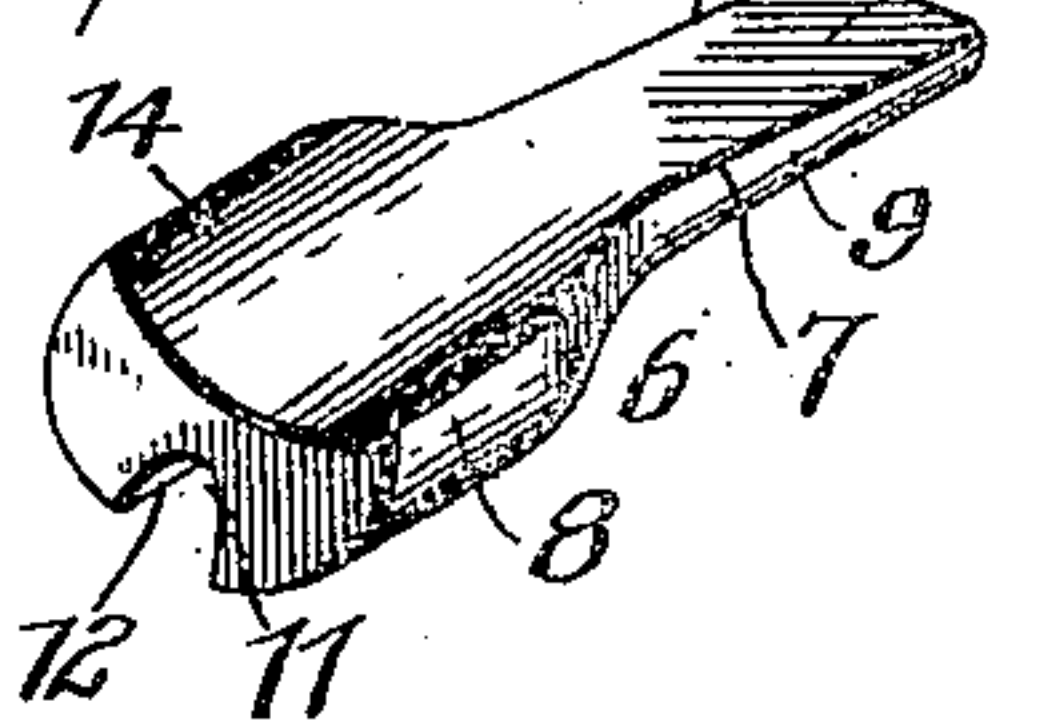


FIG. 5.

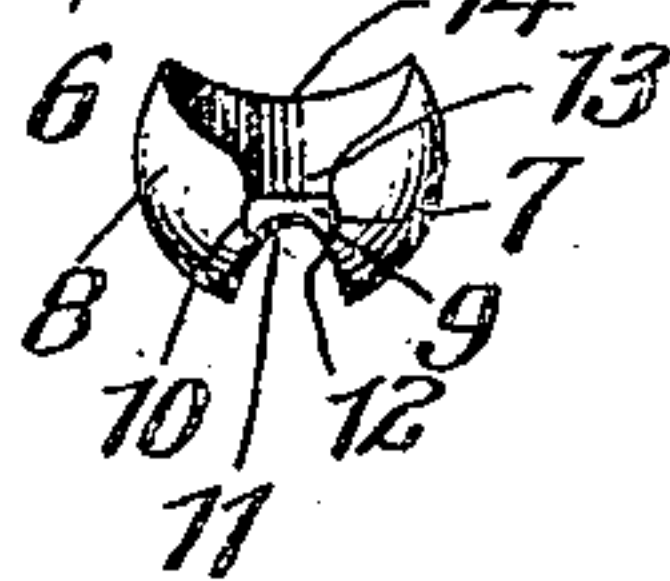


FIG. 6.

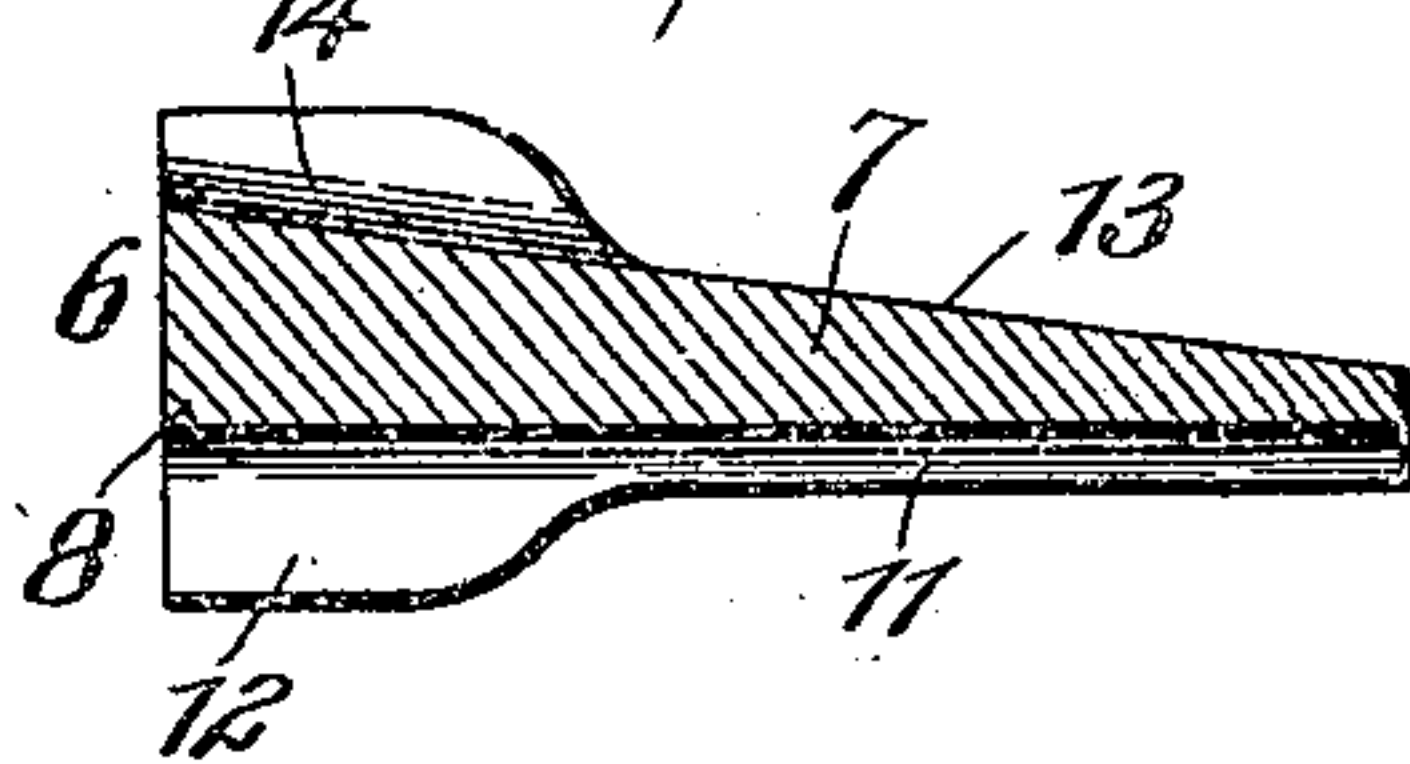


FIG. 7.

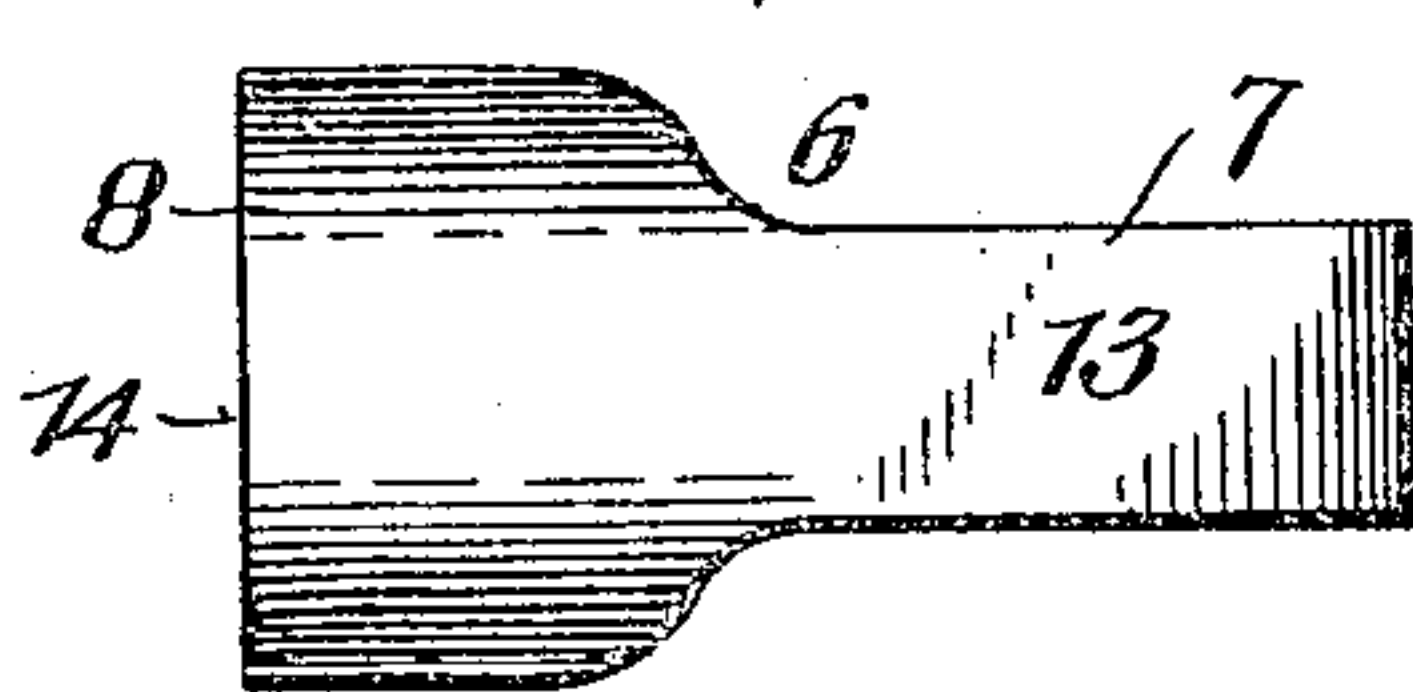


FIG. 8.

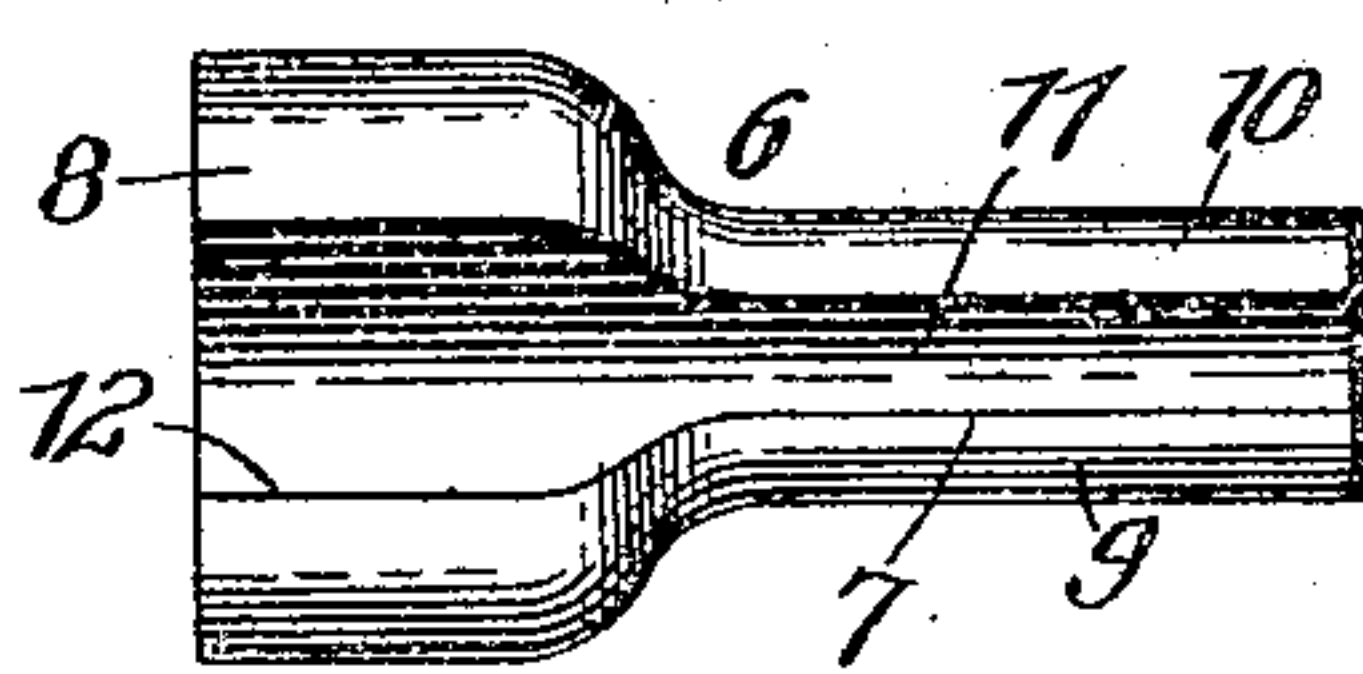
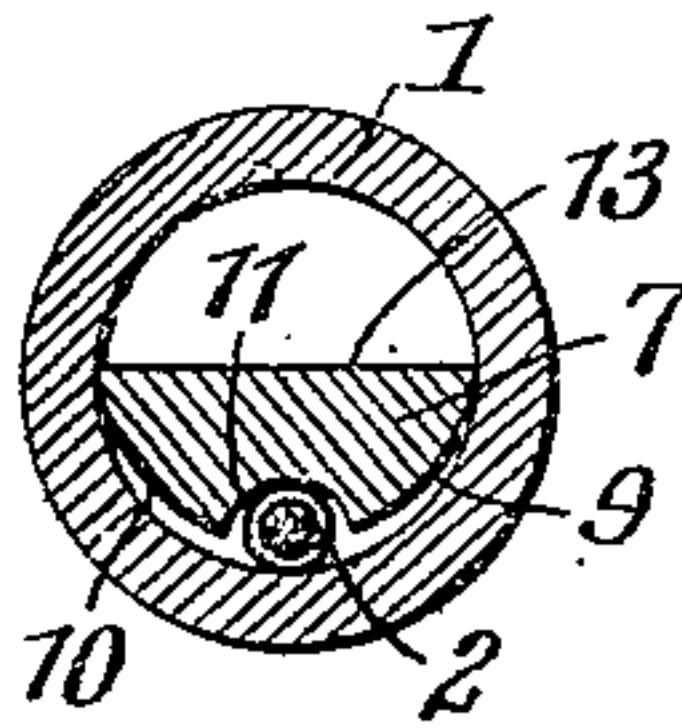


FIG. 9.



John R. Powell Inventor

Witnesses  
M. C. Syddanc  
Louis G. J. J. J.

E. G. Siger  
Attorney



# UNITED STATES PATENT OFFICE.

JOHN R. POWELL, OF PLYMOUTH, PENNSYLVANIA.

## SQUIB-HOLDER.

No. 815,212.

Specification of Letters Patent.

Patented March 13, 1906.

Application filed May 10, 1905. Serial No. 259,729.

*To all whom it may concern:*

Be it known that I, JOHN R. POWELL, a citizen of the United States, residing at Plymouth, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Squib-Holder, of which the following is a specification.

This invention relates to a novel squib holder and shield.

In mine-blasting a hole usually several feet in depth is drilled. At the inner end of this hole the charge is placed and is tamped to form a "needle-hole" extending out from the charge to the face of the rock. Sometimes in lieu of the tamping a "blasting-barrel" is inserted in the drilled opening. In either event a conduit is formed for the reception of a squib, which preferably comprises front and rear sections and a match. The squib is inserted in the outer end of the conduit, and the front section is wedged securely in place to prevent dislodgment of the squib by air or gas currents or by the concussion of adjacent blasts. The protruding end of the match is then ignited, and when the fire reaches the rear fuse-section the latter flies back and ignites the charge.

My present invention relates to a novel holder and shield for firmly securing the squib in place in the conduit and for effectually shielding the match from gas or other currents which frequently issue from the outer end of the conduit and tend to extinguish the match, which is slow-burning, before the powder or other explosive substance in the fuse proper is reached by the fire.

The object of the invention is to produce a simple inexpensive device which may be constructed from a single piece of metal or other suitable material and which when inserted in the end of the squib-conduit will secure the squib in place and effectually deflect gas or other currents away from the match, so that there is practically no danger of prematurely extinguishing the match, even though the gas-currents are sufficiently strong to dislodge an unsecured squib from the conduit.

To the accomplishment of this object the invention resides in that construction of holder and shield to be hereinafter described, illustrated in the accompanying drawings, and defined in the appended claims.

In said drawings, Figure 1 is a side elevation of a blasting-barrel with my holder and shield applied as in use. Fig. 2 is an end view of the subject-matter of Fig. 1. Fig. 3

is a longitudinal vertical section of the same. Fig. 4 is a perspective view of the holder detached. Fig. 5 is a rear end elevation thereof. Fig. 6 is a longitudinal sectional view of the holder. Figs. 7 and 8 are top and bottom plan views, respectively, of the same subject-matter, and Fig. 9 is a transverse section on the line 9 9 of Fig. 3.

1 indicates a blasting-barrel which extends back to the charge (not shown) and constitutes a squib-conduit, it being understood that my invention is applicable for the holding and shielding of a squib within a conduit regardless of the manner in which the latter is formed.

2 indicates a squib, the form shown comprising front and rear sections 3 and 4 and a match 5 extending from the front end of the section 3. The squib holder and shield 6 is designed to securely hold the front section 3 against the wall of the conduit. The holder 6 is preferably formed in a single piece of metal and comprises a tapered portion or wedge 7 and an enlarged head 8. Viewed in plan the wedge 7 is substantially parallel-sided; but the upper and lower edges thereof converge rearwardly, as shown in Fig. 6. The side faces 9 and 10 of the wedge 7 are rounded, as shown in Fig. 9, the curvature of these faces corresponding substantially to that of the squib-conduit. The head 8 is considerably larger than the wedge and projects beyond the outer end of the squib-conduit. In fact, this head is preferably of such size as to prevent the holder from being forced entirely within the barrel or conduit 1. Extending longitudinally of the under side or face of the holder from end to end thereof is a groove or inverted trough 11, that portion of the trough extending along the wedge being too shallow to entirely receive the squib, and thus causing the latter to project below the wedge and in contact with the bottom wall of the conduit. As the top wall of this groove or channel 11 extends in a substantially straight line from end to end of the holder, its front end is comparatively deep in consequence of the comparatively large diameter of the head 8. This deepened portion of the channel or trough 11 is indicated by 12 in Fig. 3 and is designed to constitute a shield or protector for that part of the squib which is bent downwardly to dispose the match considerably below the outer end of the squib-conduit. When the holder is inserted, the bottom wall of the wedge 7 is substan-



tially parallel with the adjacent wall of the conduit, the upper edge 13 thereof being upwardly inclined from the rear end of the wedge to the front or outer end of the head 8, the top side of the head being formed with a concavity 14, the bottom of which constitutes a continuation of the upper edge or face 13 of the wedge 7.

In practice the holder and squib are inserted in the outer end of the squib-conduit until the combined dimensions of the wedge and squib are sufficient to cause them to bind against the walls of the conduit with sufficient friction to securely retain the parts in place, it being understood, of course, that as the walls of the conduit converge upwardly from the horizontal diameter thereof the wedge will engage these walls with increasing resistance as said wedge is moved farther into the conduit.

It will be noted that above the holder is formed a vent through which gases may escape from the conduit without being discharged in proximity to the squib. On the contrary, the squib being located below the holder and having its match end bend downwardly and the upper edge of the holder being upwardly and outwardly inclined, as shown, the escaping gases will be directed upwardly away from the match and will be separated from the latter by the interposed holder.

Obviously the upper side of the head might be made flat instead of concaved, as shown, or in lieu of the concavity the upper portion of the head might be pierced by an opening extending back to the conduit, it being essential, however, that some provision be made for the escape of gas and that the escaping gas be so directed that it will not tend to extinguish the match of the squib.

It is thought that from the foregoing the construction of my novel squib holder and shield will be fully comprehended; but while the present embodiment of the invention is thought at this time to be preferable I desire to reserve the right to effect such changes, modifications, and variations of the illustrated structure as may come fairly within the scope of the protection prayed.

What I claim is—

1. A squib-holder, including a wedge having rounded sides and converging top and bottom faces, one of which latter is provided with a longitudinal groove or channel.

2. A squib-holder, including a wedge having substantially parallel transversely-rounded sides and a longitudinal groove or channel extending along its bottom.

3. A squib-holder, including a wedge having a longitudinal groove or channel of substantially the same depth for the major portion of its length.

4. A squib-holder including a wedge having substantially parallel sides, and a groove

or channel extending along one of the converging sides of the wedge and of substantially the same depth for the major portion of its length to provide for comparatively extensive engagement of the squib.

5. In combination, a squib-conduit, and a squib-holder including a wedge extended into the conduit and spaced from the upper side thereof to provide a vent, said wedge having a longitudinal groove or channel in its under side face for the reception of the squib.

6. In combination, a squib-conduit, and a squib-holder, including a wedge extended into the conduit and having its upper face spaced from the upper side of the conduit to form a vent and inclined upwardly toward the outer end of the conduit to deflect the escaping gas upwardly, and a longitudinal groove or channel extending along the under side of the wedge to receive the squib.

7. As a new article of manufacture, a squib-holder, including a wedge adapted to be inserted in the squib-conduit, and an enlarged head at one end of the wedge.

8. As a new article of manufacture, a squib-holder comprising a wedge, an enlarged head at one end thereof, and a longitudinal groove or channel for the reception of the squib.

9. A squib, having an enlarged head, a comparatively narrow wedge extended from the head, and a longitudinal groove or channel extending from end to end of the holder.

10. A squib-holder, comprising a wedge, and an enlarged head at one end thereof, said holder having a longitudinal groove or channel extending along its under side from end to end thereof, the upper face of the holder being upwardly inclined from the inner end of the wedge to the outer end of the holder.

11. A squib-holder, including a wedge having parallel sides and converging top and bottom faces, an enlarged head at one end of the wedge, a longitudinal groove extending the entire length of the holder at the under side thereof, and a concavity formed in the upper side of the head to prevent said head from obstructing the escape of gases from a squib-conduit in which the wedge is inserted.

12. As a new article of manufacture, a transversely trough-shaped squib-shield.

13. As a new article of manufacture, a transversely trough-shaped squib-shield having a longitudinal taper to permit said shield to be wedged into the squib-conduit.

14. The combination with a squib-conduit, of a squib shield and holder arranged to guard the squib-match and having a tapered portion adapted to be wedged in the conduit.

15. In combination with the blasting-barrel, a squib shield and holder formed of flame-resisting material and constructed to be secured in and project from the barrel and form a protection for the squib, the part of the shield and holder within the barrel serving to hold the squib in place.



16. In combination with the blasting-barrel, a squib-shield independent of the squib and held in place by the barrel so as to partially inclose and protect that portion of the  
5 squib projecting from the barrel.

17. As a new article of manufacture, a squib-shield of the character described, designed to shield all except the extremity of a squib-match projecting from the squib-conduit, said shield having a tapered portion  
10 adapted to be wedged in the conduit to insure its retention in place.

18. The combination with a squib-conduit, of a squib shield and holder retaining the

squib against movement in the conduit and  
15 arranged to guard the squib-match projecting beyond the outer end of the conduit.

19. The combination with a blasting-barrel, of a tapered squib-shield wedged therein and having its larger end projecting there-  
20 from.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN R. POWELL.

Witnesses:

C. W. HONEYWELL,

OWEN W. EDWARDS.