

(No Model.)

C. H. SMITH.

SNAP HOOK.

No. 353,890.

Patented Dec. 7, 1886.

Fig. 1

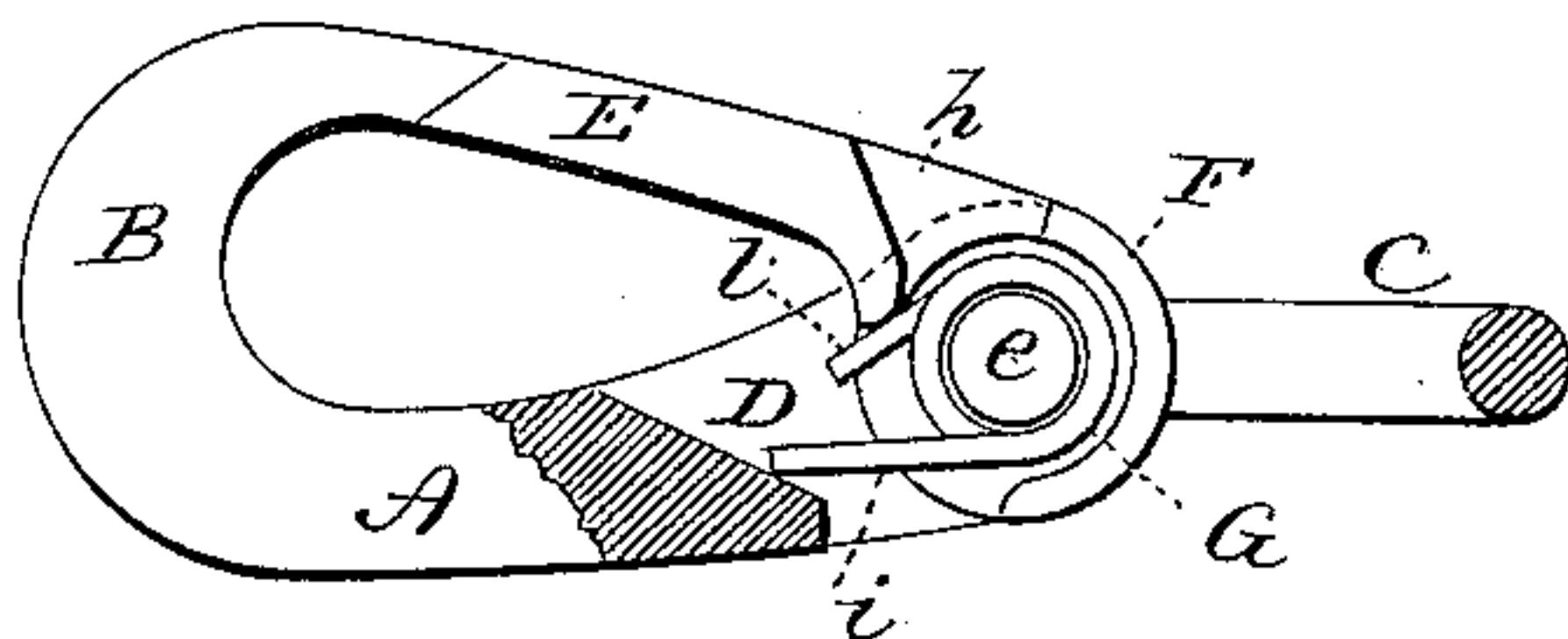


Fig. 2

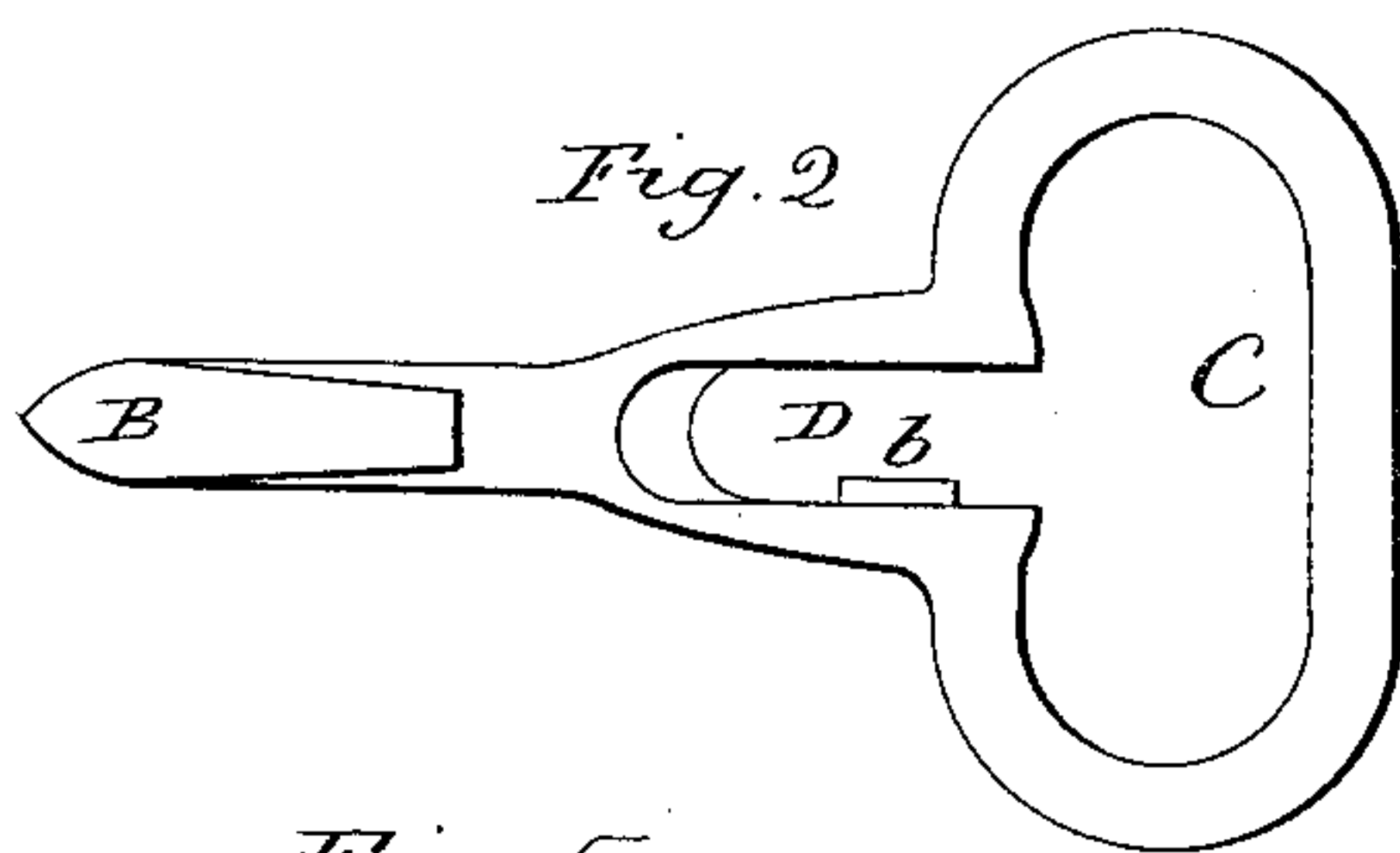


Fig. 3

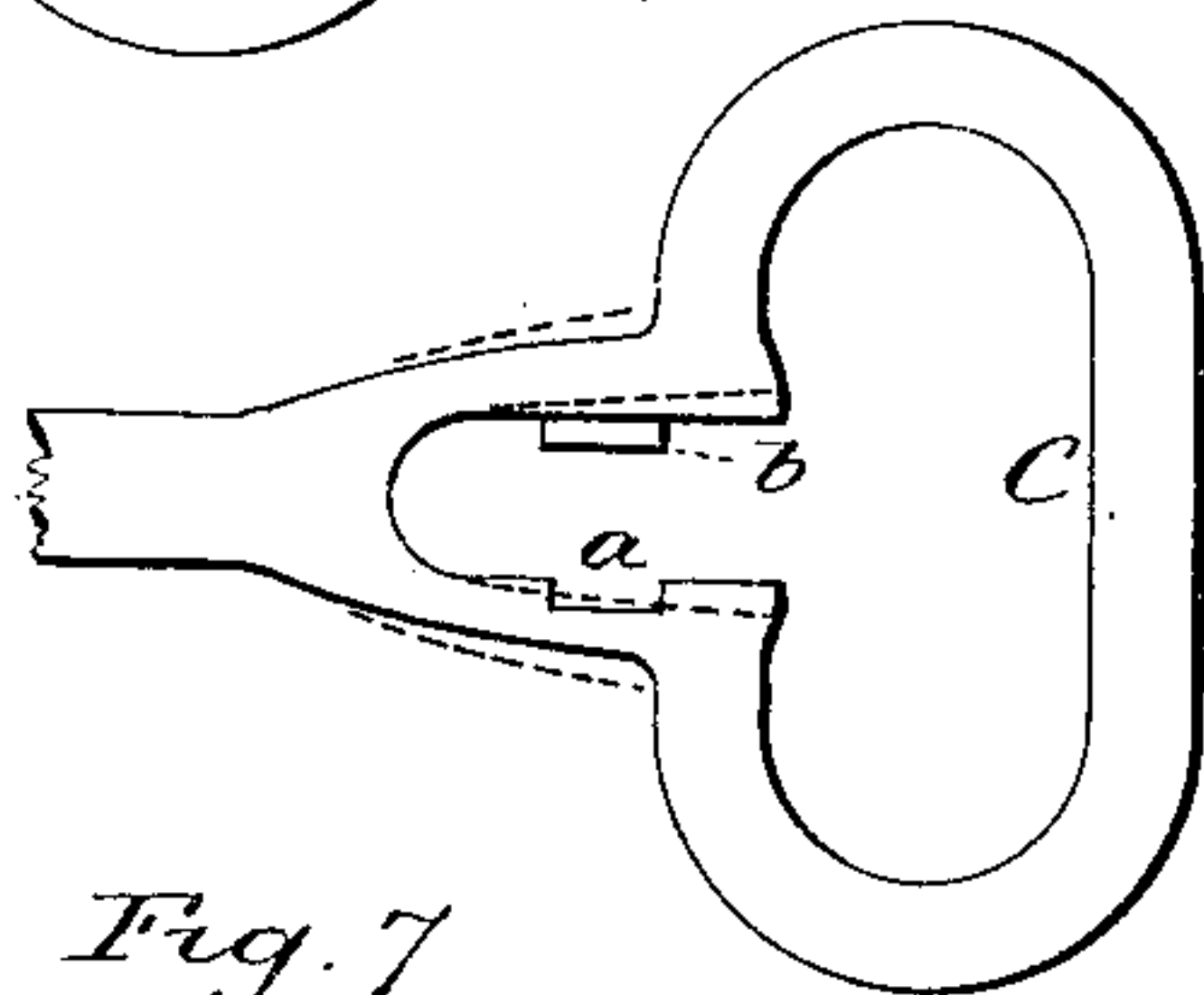


Fig. 4

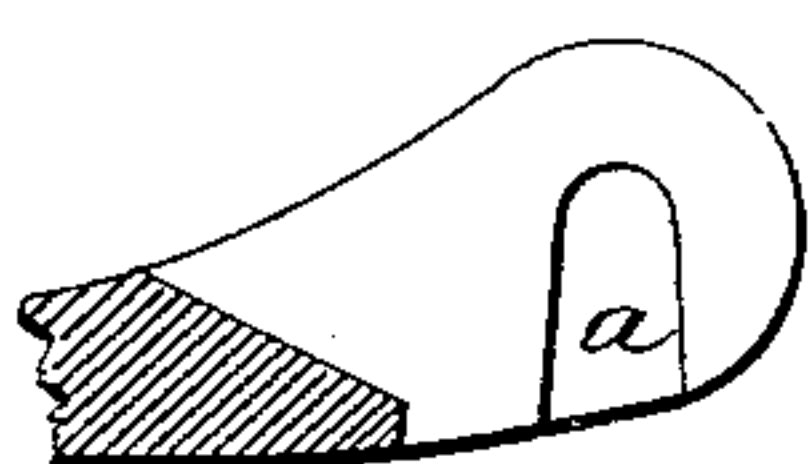


Fig. 5

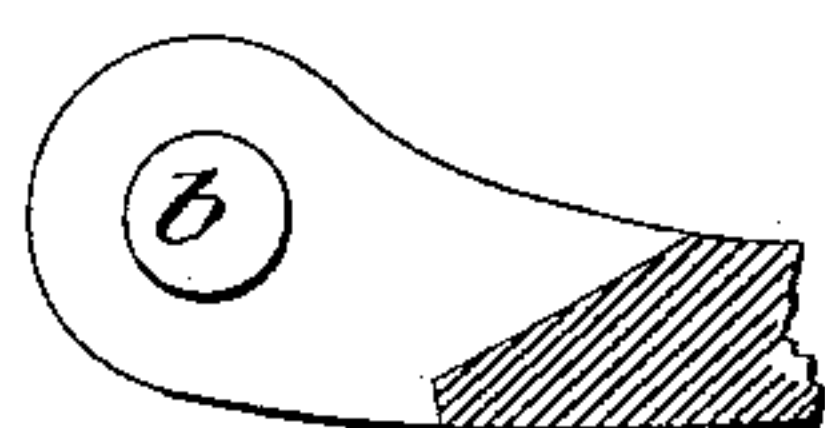


Fig. 13

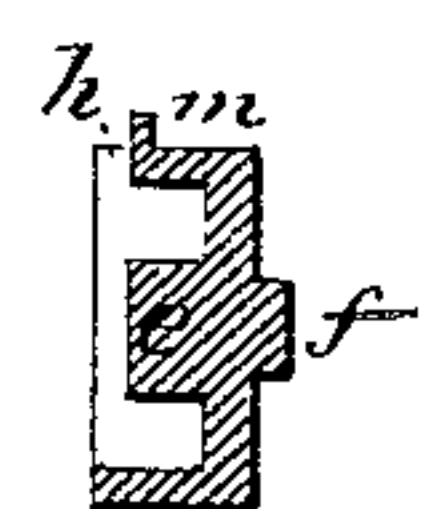


Fig. 14

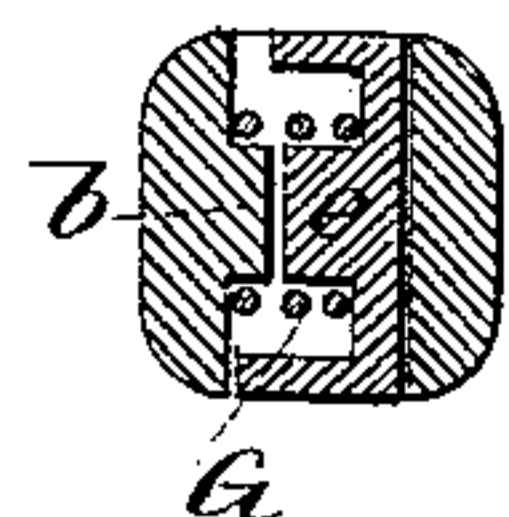


Fig. 11

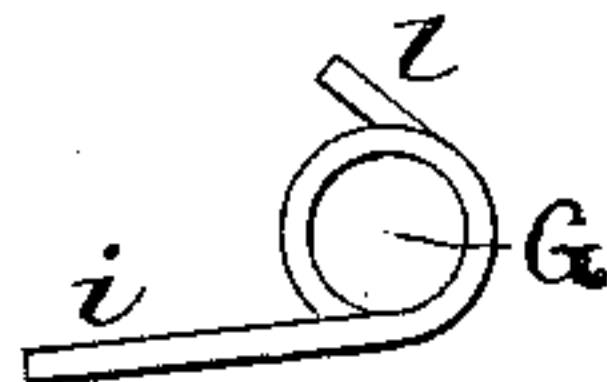


Fig. 6

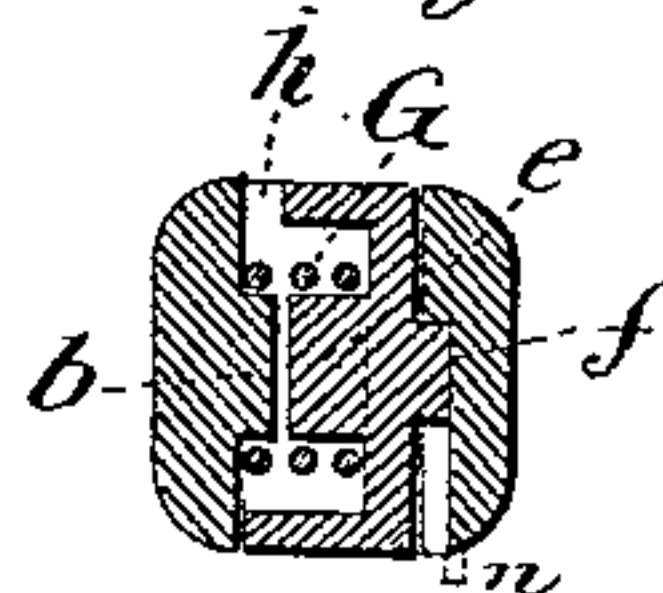


Fig. 12

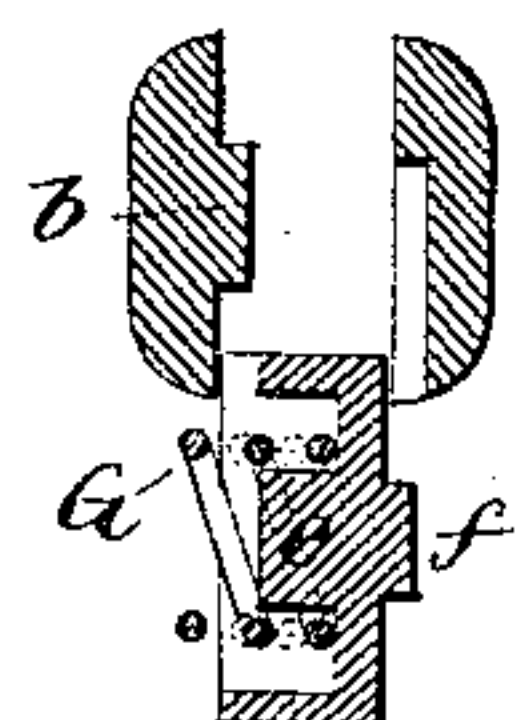


Fig. 7

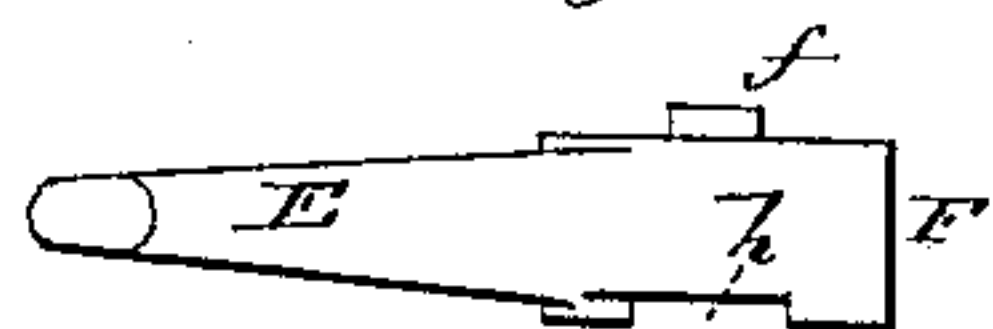


Fig. 8

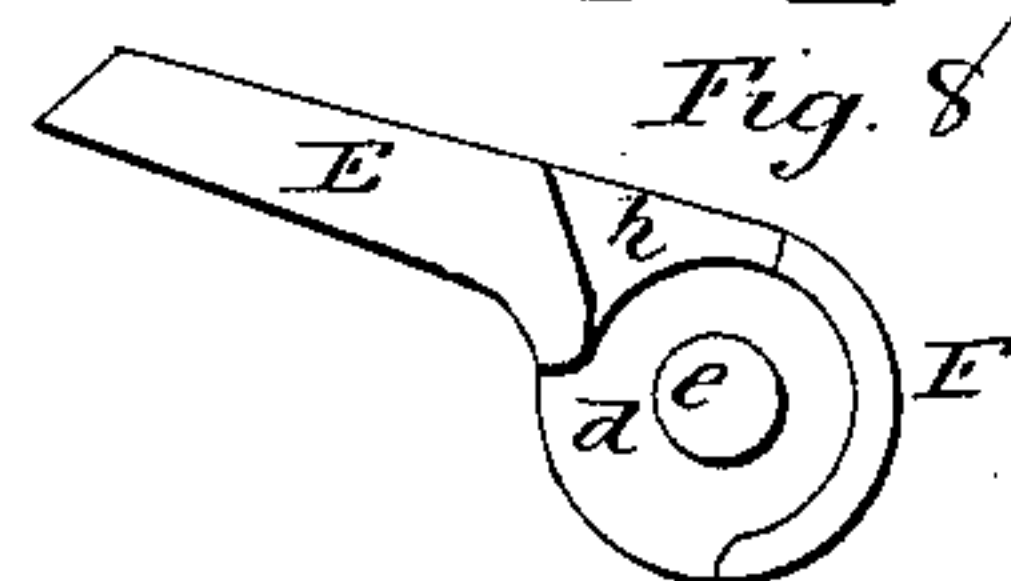


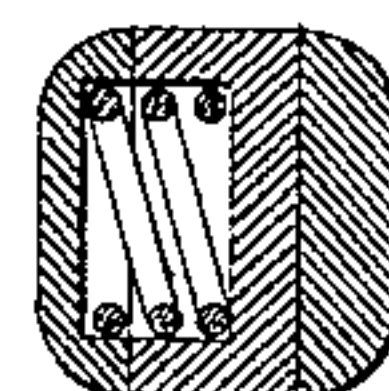
Fig. 9



Fig. 10



Fig. 15



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# UNITED STATES PATENT OFFICE.

CHARLES H. SMITH, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO O. B. NORTH & CO., OF SAME PLACE.

## SNAP-HOOK.

SPECIFICATION forming part of Letters Patent No. 353,890, dated December 7, 1886.

Application filed September 20, 1886. Serial No. 213,996. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. SMITH, of New Haven, in the county of New Haven and State of Connecticut, have invented a new  
5 Improvement in Snap-Hooks; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and  
10 which said drawings constitute part of this specification, and represent, in—

Figure 1, a sectional side view of the hook; Fig. 2, a top view, the tongue removed; Fig. 3, an under side view, the tongue removed;  
15 Fig. 4, a longitudinal section showing the side of the recess in the body in which the groove *a* is formed; Fig. 5, a longitudinal section showing the opposite or stud side of the recess; Fig. 6, a transverse section cutting through  
20 the hub; Fig. 7, a top view of the tongue detached; Fig. 8, a recessed side view of the tongue; Fig. 9, an under side view of the tongue; Fig. 10, the stud side view of the tongue; Fig. 11, the spring detached; Fig. 12,  
25 a transverse section through the hub, showing the method of introducing the tongue and spring; Figs. 13, 14, and 15, modifications.

This invention relates to an improvement in that class of snap-hooks in which the body is  
30 constructed with a hook at one end and with a loop at the opposite end, with a tongue hung in a recess in the body in the plane of the hook, and provided with a spring to force the tongue up and outward against the end of the hook,  
35 the object of the invention being to make the spring perform the double function of a spring for the tongue and as the means for holding the tongue upon its pivot.

A represents the body, terminating at one  
40 end in a hook, B, and at the opposite end in the usual loop, C. The body is constructed with a longitudinal recess, D, in the plane of the hook, and in this recess the tongue E is arranged, the width of the recess corresponding to the hub  
45 F of the tongue, so as to allow free play of the tongue. The recess D is constructed upon one side with a groove, *a*, opening to the under side of the body, and extending upward terminates in semicircular shape concentrically, as  
50 seen in Figs. 3 and 4. Upon the opposite side

of the recess is an inwardly-projecting stud, *b*, as seen in Figs. 2 and 4, the stud *b* and the semicircular end of the groove *a* being concentric the one with the other.

The hub F of the tongue is constructed with  
55 a recess, *d*, upon one side to form the spring-chamber, and concentrically in this recess is a stud, *e*, a little smaller in diameter than the internal diameter of the spring to be employed. Upon the other side of the hub is a  
60 concentrically-projecting stud, *f*, corresponding to the groove *a* in the recess of the body, and so that the hub may be set into the recess in the body. The stud *f* passing into the groove *a*, and arriving at its concentric seat,  
65 the studs *d* and *f* will stand concentric and in line with the stud *b* in the recess, as seen in Fig. 6.

On the recessed side of the hub a notch, *h*, is cut from the recess outward sufficient to per-  
70 mit the hub to pass the stud *b* as it enters the recess in the body.

The spring G (see Fig. 11) is a helical spring wound open, and of an internal diameter slightly larger than the studs *e* *b*, and so that it  
75 may be set into the recess in the tongue around the stud *e*. At one end of the spring it terminates in an arm, *i*, and at the opposite end it terminates in an arm, *l*, one arm, *l*, adapted to take a bearing upon the tongue, and the  
80 other arm, *i*, to take a bearing upon the body of the hook in the usual manner for this class of springs, and so that the spring acts between the tongue and body as a torsion-spring. The length of the helical spring is  
85 somewhat greater than the depth of the recess in the tongue.

The spring is introduced into the recess in the tongue and around the hub *e*, as seen in Fig. 12, and because of its length it extends  
90 outside the plane of the recessed side of the hub.

To introduce the tongue and spring to the body the spring is compressed, as indicated in broken lines, Fig. 12, to such an extent that  
95 it may pass the stud *b*, and thus compressed the tongue is passed up through the recess D in the body, the notch *h* permitting it to pass the stud *b*, and the compressed condition of the spring permitting it also to pass the hub, 100



until it arrives at the concentric position, then the spring left free expands in the direction of its length and passes onto the stud *b*, as seen in Fig. 6. Because of thus passing onto the hub, the spring acts as a sleeve over the stud *e* on the tongue and the stud *b* on the body, and thus forms a support between the two to hold them in line, or concentric position. The hub of the tongue cannot be moved in any direction except rotative, because the spring held in the hub embraces the stud *b* in the recess, and it can only be removed by forcibly compressing the spring, so that it may escape the stud *b*, and this operation is one of extreme difficulty, so that while the parts are readily assembled there is no liability of their displacement by accident. By this construction the tongue in being introduced may pass below the nose of the hook without turning the hook to one side; hence the body and hook may be cast in the same plane in which they are to stand without turning to one side, as in the more general construction, and which necessitates the bending of the hook into its natural plane after the tongue is introduced, and in which operation very many hooks are lost. Again, this method of supporting the tongue avoids casting the recess open and then closing the recess upon the hub after the tongue is introduced; in fact, the hook and tongue are cast in their complete shape and form without bending of any character, and all loss due to the bending, as in previous constructions, is avoided.

If it should be desirable to close the notch *h* in the tongue, it may be done by casting the tongue with an upwardly-projecting flange, *m*, adjacent to the notch *h*, as seen in Fig. 13, and which, after the tongue is introduced, may be bent down to close the recess. So, also, should it be desirable to close the opening in the groove *a*, a flange, *n*, may be cast upon the side of the body adjacent to the open end of the groove, as seen in Fig. 6, and turned inward after the tongue has been introduced; but neither of these flanges are necessary, as the exposure through the openings is no objection.

I prefer to construct the tongue with the concentric stud *e* in the recess; but this may be omitted, as indicated in broken lines, Fig. 6, the spring taking its bearing upon the stud *b* on its inside, and outside upon the wall of the recess in the hub. I also prefer to construct the body with the groove *a*, and the tongue with a corresponding stud, *f*; but these may also be omitted, as seen in Fig. 14.

The notch *h* may be omitted in the tongue, and the recess in the body cast in a spread condition, as indicated in broken lines, Fig. 3, and the body closed after the tongue is introduced, the spring extending onto the stud *b*, as before described, and so as to form the bearing between the tongue and body.

The engagement between the spring and the body, whereby the spring substantially forms

the pivot upon which the tongue turns, may be made by constructing the side of the recess in the body with a cavity, instead of the stud *b*, as seen in Fig. 15, the diameter of the cavity corresponding to the external diameter of the spring, and so that in introducing the tongue the spring, being compressed to enter the recess *D*, will, when brought to its concentric position, expand in an axial direction and enter the cavity, as in Fig. 15. It is therefore only essential to the invention that the body shall be constructed to receive the spring under its expansion in an axial direction.

By taking advantage of the expanding force of the spring in a longitudinal or axial direction to engage the tongue with the body and form a bearing upon which the tongue turns, I avoid much of the mechanical labor necessary in previous constructions in securing the tongue in place, and consequently reduce the cost of manufacture.

Certain features of the hook described in this application are also shown in two other applications which I have made for Letters Patent, Serial Nos., respectively, 213,995 and 215,217, and I do not wish to be understood as claiming anything in this application which I have claimed in either of the said two applications.

I claim—

1. In a snap-hook substantially such as described, the combination of the body constructed with a hook at one end and an attaching device at the other end, and with an open recess, *D*, at the loop end in the plane of the hook, a tongue having a hub corresponding to said recess in the body, and constructed with a concentric recess in one of its sides, and an open helical spring adapted for contraction and expansion in the direction of its axis, and terminating at each end in an arm, one of which takes a bearing upon the body and the other upon the tongue, and whereby the torsion of the spring serves to yieldingly hold the tongue in its closed position, the corresponding side of the body constructed to receive the said spring under its expansion in an axial direction, substantially as described, and whereby said spring substantially forms the pivot upon which the said tongue rotates.

2. In a snap-hook, the combination of the body *A*, constructed with a hook at one end and an attaching loop at the other end, and with an open recess, *D*, at the loop end in the plane of the hook, the said recess constructed with a stud, *b*, upon one side, the tongue *E*, having its hub corresponding to said recess in the body, and constructed with a recess, *d*, in one side of its hub, concentric with the stud *b* in the body, and an open helical spring, *G*, in the said recess in the hub, the said spring extending to and surrounding the said stud *b* on the body, the said spring terminating at each end in an arm, one of said arms taking a bearing upon the body and the other upon the tongue, substantially as described.



3. The combination of the body A, terminating at one end in a hook, B, and at the other end in an attaching-loop, C, constructed with a recess at its loop end, in the plane of the hook, 5 with a stud, *b*, in one side of said recess, the tongue E, constructed with a hub, corresponding to said recess in the body, and with a concentric recess in the same side of the hub as the stud *b* on the body, and with a stud, *e*, in 10 said recess, and concentric therewith, corresponding to the said stud *b* on the body, and an open helical spring in said recess in the hub, and around the stud therein, the said spring also extending onto the stud *b*, each end of the 15 spring terminating in an arm, one of said arms taking a bearing upon the body and the other upon the tongue, substantially as described.

4. The combination of the body A, terminating at one end in the hook B and at the opposite end in an attaching-loop, C, constructed 20

with a recess, D, at the loop end, the said recess constructed upon one side with an inwardly-projecting stud, *b*, and upon the opposite side with a groove opening downward, the upper end of the groove concentric with said 25 stud, the tongue E, having its hub corresponding to said recess, and the hub constructed with a concentric recess upon one side and with a concentric stud upon the opposite side, with an open helical spring in the recess in the 30 hub, the said spring extending to and surrounding the said stud *b* on the body, and the spring constructed with an arm at each end, one arm taking a bearing upon the body and the other upon the tongue, substantially as described. 35

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Witnesses:

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A. H. JACKSON.