

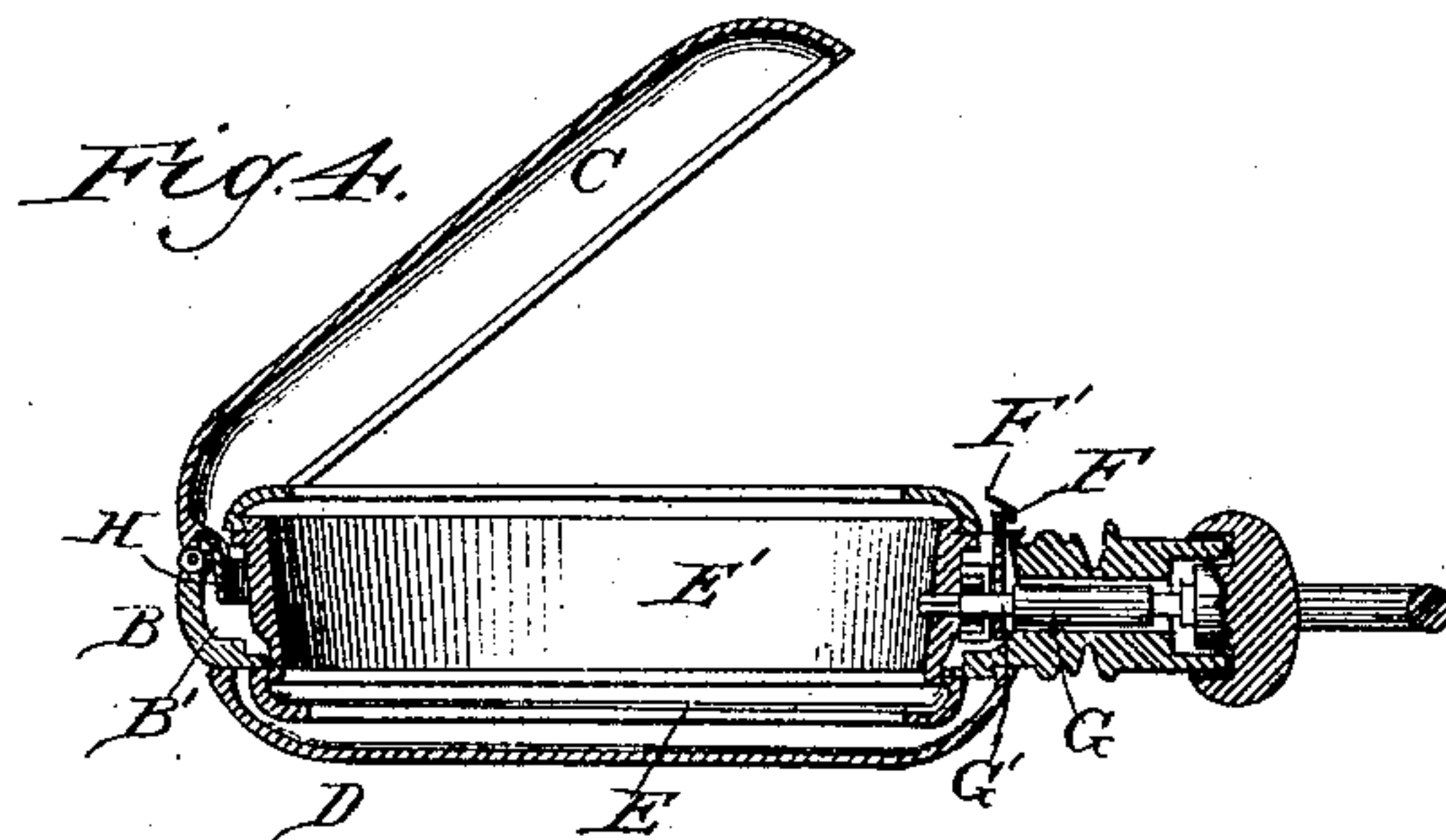
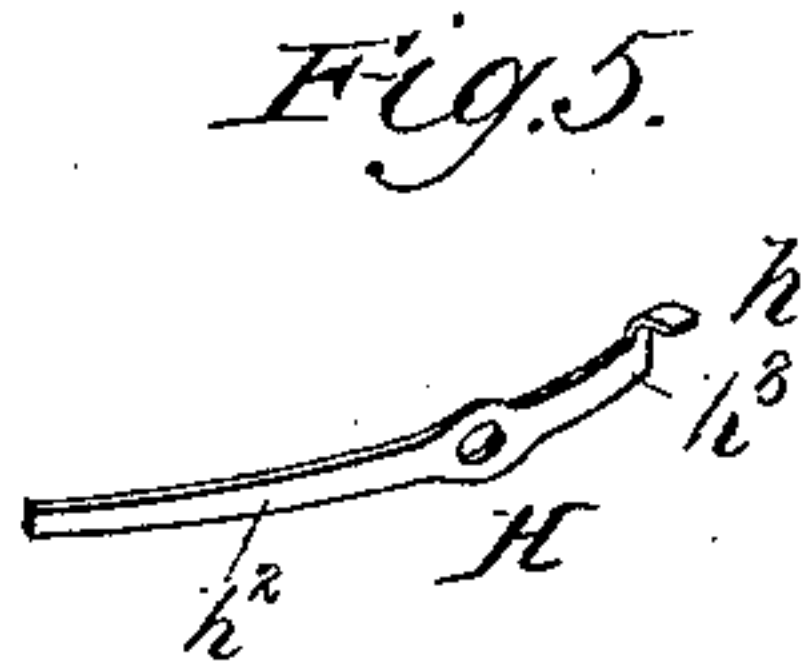
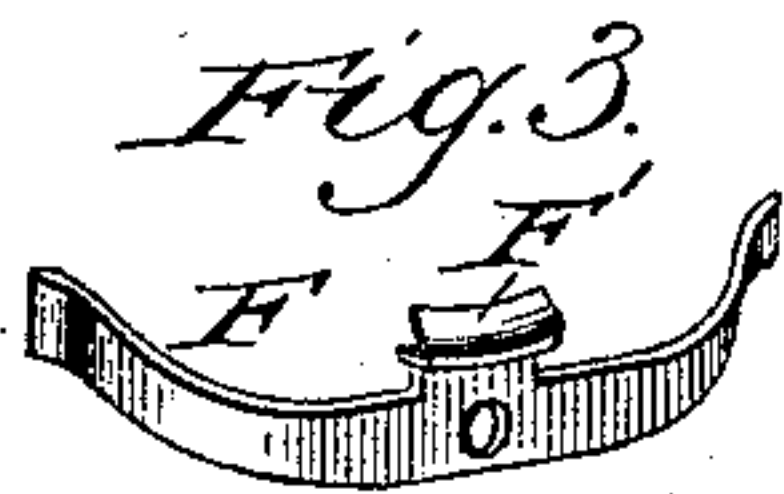
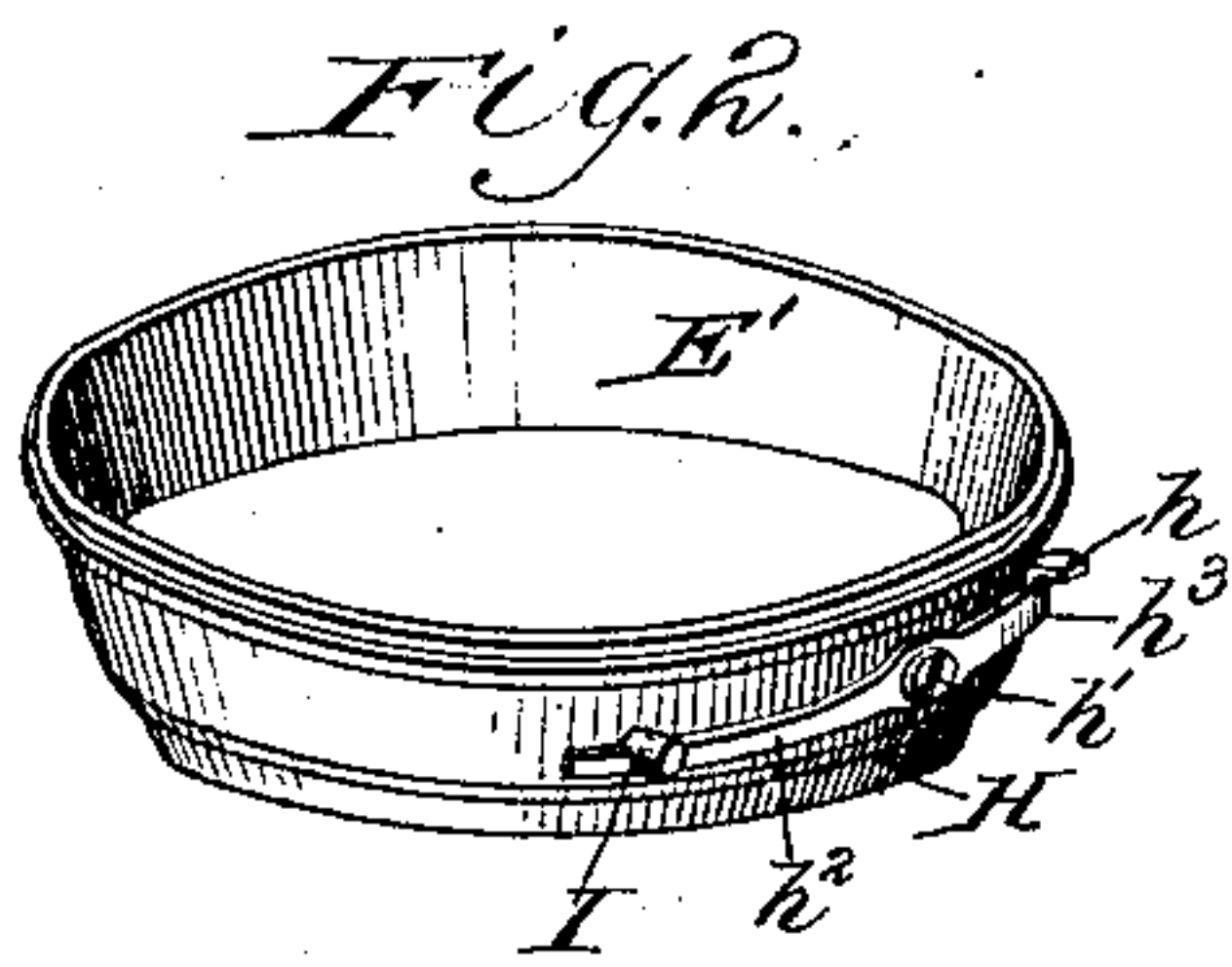
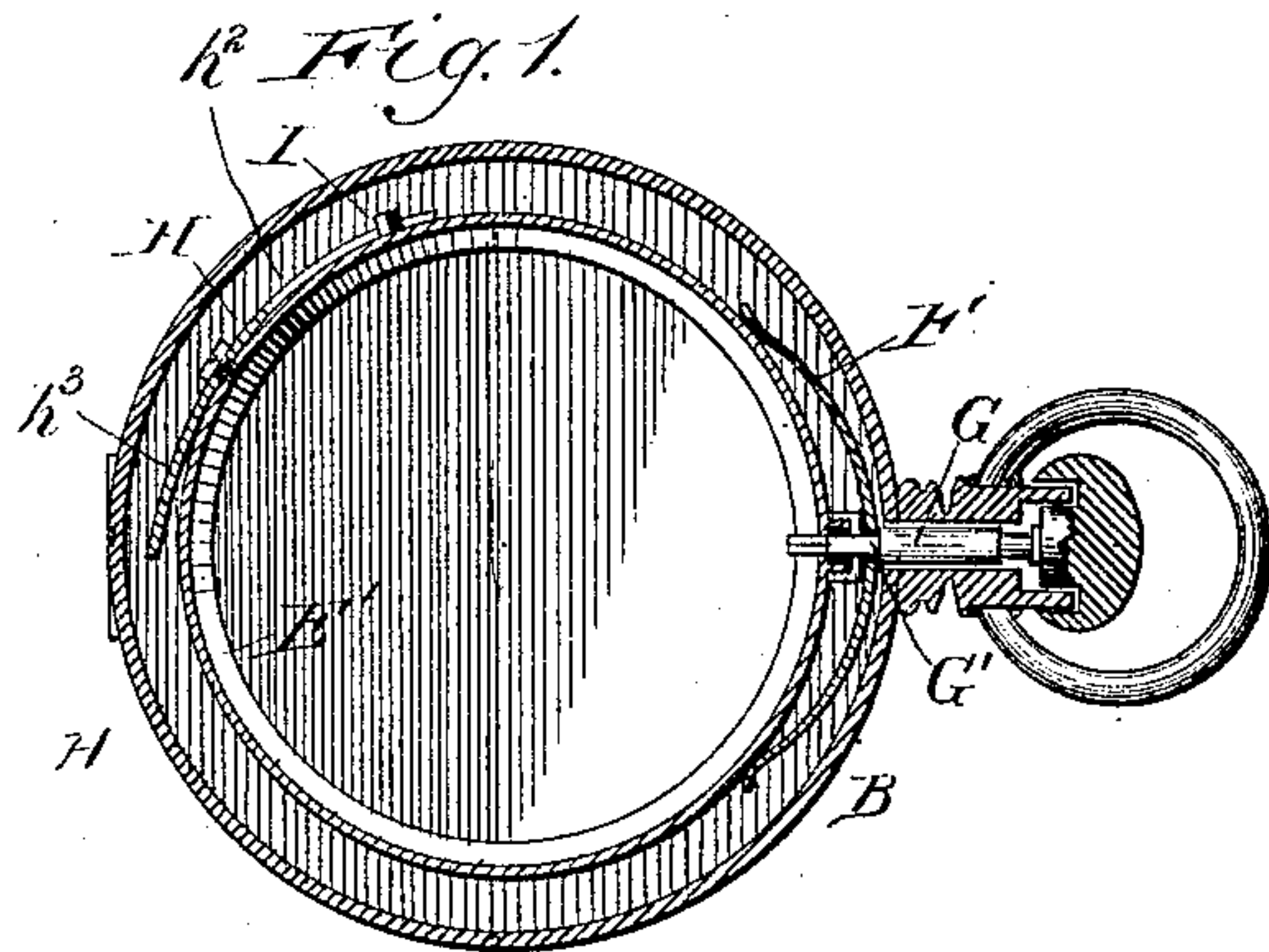
(No Model.)

W. H. FITZ GERALD & G. C. SMITH.

WATCH CASE SPRING.

No. 297,123.

Patented Apr. 22, 1884.



Witnesses.

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# UNITED STATES PATENT OFFICE.

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## WATCH-CASE SPRING.

SPECIFICATION forming part of Letters Patent No. 297,123, dated April 22, 1884.

Application filed August 6, 1883. (No model.)

*To all whom it may concern:*

Be it known that we, WALTER H. FITZ GERALD and GEORGE C. SMITH, both citizens of the United States, residing in Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Watch - Case Springs, of which the following is a specification.

This invention relates to springs for watch-cases, commonly known as the "catch" and "lift" springs, the former being employed for engaging and holding closed the hinged front, and the latter for lifting or throwing open the hinged front after the spring - catch has been released therefrom. A serious objection to these springs as heretofore constructed and applied has been their liability to breakage, and the inconvenience and expense attending their manufacture and adjustment in and to the watch-case. Such springs have usually been made large and heavy at one end, which is secured in and to the case, while the free end for lifting the front or for engaging and locking down the latter has been arranged to bear against the under side of the front where the spring is used as a lift-spring, and to engage the front where it is employed as a catch-spring, which, as is well known, is operated to release the free edge of the hinged front by pushing in the stem. Such springs require time and labor to secure them to the case, and when secured frequently break by reason of the severe strain to which they are subjected. A lift-spring for a watch-case has also been made in the form of a bow, with the lip or catch for engaging the front made at the middle of the bow, and such spring has been arranged between the movement and the rim, with the ends of the spring that are provided with flanges secured between said two members. This spring is, however, open to the objection that the ends of the spring being secured, the spring, when bent, is liable to become broken. In another instance, a hoop-spring, as contradistinguished from a bow-spring, has been provided for a watch-case, said hoop-spring being adapted to subserve the combined functions of a catch and a lift-spring, for which said purpose the spring is divided to form two free ends, and provided at its middle with a catch for engaging the

free edge of the lid, while the free ends of the spring are bent up so as to engage the lid near the point at which it is hinged; but a single spring for both of such purposes does not admit of the required readiness of operation, since, by reason of its free ends engaging the lid, the said ends cannot slide freely to allow the portion of the spring carrying the catch to be partially straightened out when the stem is pushed inwardly.

It is the object of our invention to obviate such objections, and to provide a watch-case with an improved construction and arrangement of both catch and lift springs which shall be strong, durable, and efficient, and at all times have a certainty of action. These objects we attain by means of the catch and lift-springs constructed and applied to a watch-case in the manner hereinafter described and claimed, and illustrated in the annexed drawings, in which—

Figure 1 represents a section taken through a watch-case on a plane coincident with the face or front thereof, and illustrates our improved spring. Fig. 2 is a perspective view of the rim detached. Fig. 3 represents the catch-spring. Fig. 4 is a section taken transversely through the watch-case. Fig. 5 is a view of the lift-spring detached.

Referring by letter to the several figures of the drawings, in which like letters denote like parts, A indicates a hunting-watch case, which can be of any ordinary or suitable construction, that herein shown being mainly composed of the following members, namely: a center, B, provided with the usual pendant, through which the stem passes, a hinged front, C, a back, D, and a bezel or cap, E, which latter is covered by the said back. The center is provided with an inner annular seat for an inner ring or rim, E', that is employed for holding the movement, said rim being seated and secured within the center in any approved manner. The catch-spring F, employed for engaging and holding the front when the latter is closed, is arranged between the center and the rim, but is unattached to either, the inner annular groove, B', of the center constituting a seat in which the spring is arranged. This catch-spring is made bow-shaped, and provided at its middle portion with a lip or



catch, F', for engaging the front when the latter is closed. This spring is arranged between the center and the rim with its ends, that are formed with slight reverse bends, bearing  
 5 against the perimeter of the latter and the middle of its bowed portion normally bearing against the inner wall of the center. By forming the ends of this bow-spring with reverse bends at its ends, said ends will ride freely  
 10 over the perimeter of the rim while the spring is straightening out or springing back from a partially straightened out position to its normal condition; and hence friction between the ends of the spring is lessened and the spring  
 15 caused to work more readily than if the ends, in place of being rounded were left so as to have sharp edges or corners bearing against the rim. The stem G, that passes through the pendant, also passes through a perforation in  
 20 the middle of the spring, and is provided with a shoulder, G', at a point beyond the spring, so that when the stem is pushed inwardly said shoulder abutting against the spring shall tend to straighten out the bow, and thereby release  
 25 the catch from the hinged front, while as soon as the stem is released the resiliency of the spring will restore it to its normal shape and force out the stem to its original position. The ends of the spring ride freely over the  
 30 perimeter of the rim while the spring is being straightened out, or while it is in the act of springing from a partially straightened out condition to its normal bow-shape; and hence it can be readily actuated by the stem for the  
 35 purpose of releasing the catch from the free edge of the hinged front; or it can be actuated by the front independently of the stem when the front is closed, so as to cause the catch to automatically engage, and thereby hold down  
 40 the front.

It will be observed that when the stem is pushed in against the spring-pressure will be exerted laterally against the middle of a bow-spring, and that by locating the catch at the  
 45 said middle portion of the spring the result attained is in effect the combined power of two spring-arms, whereby, while the spring can be easily operated, the maximum of strength will be attained with a minimum of spring metal.  
 50 Also, as the ends of the spring slide freely between the rim and the center, there will not be the same liability of the spring breaking as in those cases where the spring has its ends secured to the case. The stem can be employed  
 55 in watches in which the stem is solely employed for operating the catch-spring, or in stem-winding watches in which the stem is employed both for operating the catch-spring and for winding up the watch.

60 The lift-spring H, which we employ for throwing open the hinged front, and which has heretofore been secured at one end in and to the center, is pivotally secured at a point between its ends to the perimeter of the rim  
 65 that is fitted in the center, so that when the rim is seated and secured in the center said

spring shall lie between the two members. By pivoting this spring at a point at or near its middle, a practically compound or two-armed spring is employed, whereby the combined power of the two arms is attained, and  
 70 hence an exceedingly strong spring produced. This spring has one of its ends provided with a bent lip, h, which bears against the hinged front at a point near the hinge of the latter,  
 75 so that when the front is closed it shall depress this end of the spring. As such action will tend to turn the spring about its pivot or fulcrum H', and in order to hold the opposite end of the spring so as to attain the full spring  
 80 action of both arms of the spring, we provide upon the perimeter of the rim a suitable abutment, against which one end of the spring shall bear while the opposite end thereof is subjected to the pressure of the hinged  
 85 front.

As a simple and convenient form of abutment, we provide a stud, I, upon the rim, and form in said stud a notch in which one end of the spring is held when the opposite end thereof is subjected to the pressure or resistance of  
 90 the hinged front. The arm or part h<sup>2</sup> of the spring between the pivot and the stud is made tapering toward the end of the spring, and is preferably somewhat longer than the arm h<sup>3</sup>,  
 95 that is directly in contact with the front, whereby, when the latter portion is depressed, the tapering part of the spring between the pivot and the stud will be easily bent into bow-shape.

It will be seen that the spring is bent laterally from its edge instead of from its flat side,  
 100 and that when the arm carrying the lip is bent down, the opposite arm, being checked at its free end by the stud, will be bent or bowed, so that the spring shall be capable of flexure at  
 105 both sides of its pivot, and thereby be bent at said sides, so as to open the front when the latter is released. By giving a proper curve or bevel to the lip on the spring, the latter will, at its end carrying the lip, also be bent  
 110 laterally from its flat side to some extent when the front is closed, and hence additional power be obtained, and at the same time the spring rendered less liable of breakage. This spring  
 115 will be bent to conform to the contour of the perimeter of the rim, so to lie closely upon the same, except at its end carrying the lip, which latter end will stand slightly out from the rim, in order to bring the lip into position to bear  
 120 against the under side of the hinged front.

When the bow-shaped catch-spring is used in a watch-case without a rim, the spring could be made operative by applying it to the center and providing on said center any suitable bearings for the ends of the spring. Also,  
 125 provision can be made for using the lift-spring in a watch-case without a rim. This can be accomplished by pivotally connecting the spring with the center and providing on the latter the abutment or some equivalent means  
 130 for holding one end of the spring.

Having thus described our invention, what



we claim, and desire to secure by Letters Patent, is—

1. The combination, with a watch-case, of the bow-shaped catch-spring F, provided with a catch at its middle, and having its ends loosely resting against the rim between the rim and the center and free to slide over the perimeter of the rim while the spring is being operated, substantially as described.
2. The combination, with a watch-case, of the bow-shaped catch-spring F, provided with a catch at its middle, and having its ends bent reversely to the main bend of the spring and loosely resting against the rim between the latter and the center, substantially as described.
3. The combination, in a watch-case having a hinged front, of the lift-spring H, located between the center and the rim, and pivoted at a point between its ends to the latter, and means for holding one end of the spring when the opposite end thereof is depressed by the hinged front, substantially as described.

4. The combination, with a watch-case having a hinged front, of the bow-shaped catch-spring F, having a catch at or near its middle, and arranged between the rim and the center with its ends free to slide along the rim when the spring is operated, said spring being provided with an opening through which the stem passes, substantially as described.

5. The combination, in a watch-case having a hinged front, of the lift-spring located between the center and the rim, and pivoted at a point between its ends to the latter, said rim being provided with a stud or abutment for holding one end of the spring when the opposite end thereof is depressed by the hinged front, whereby the spring shall be capable of flexion at both sides of its pivot, substantially as described.

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