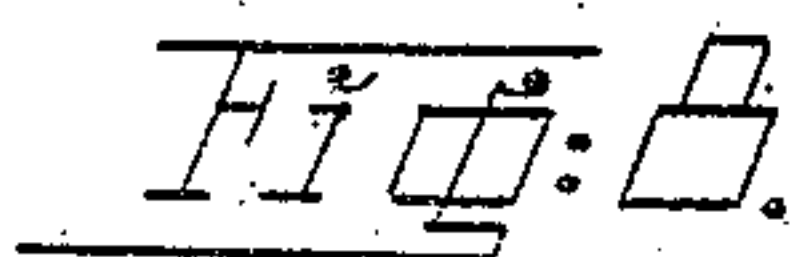
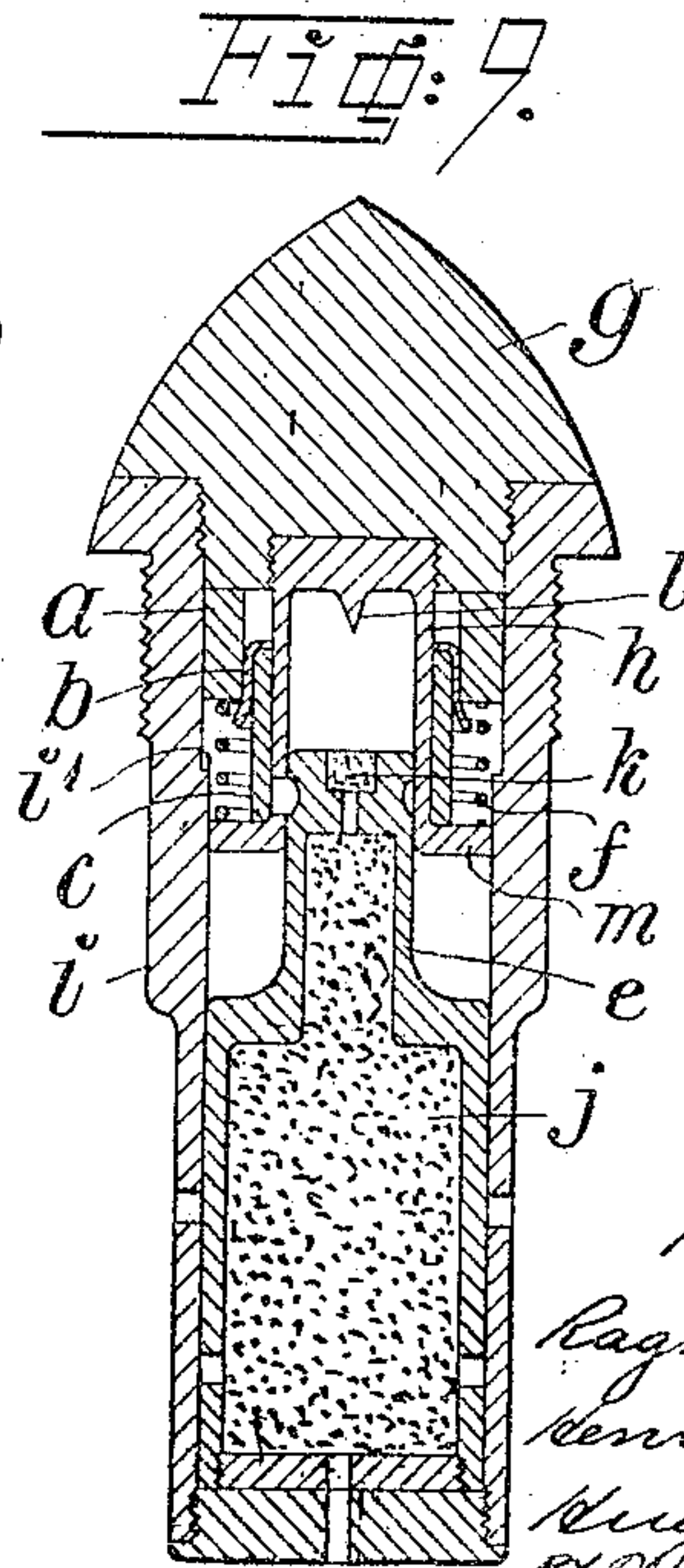
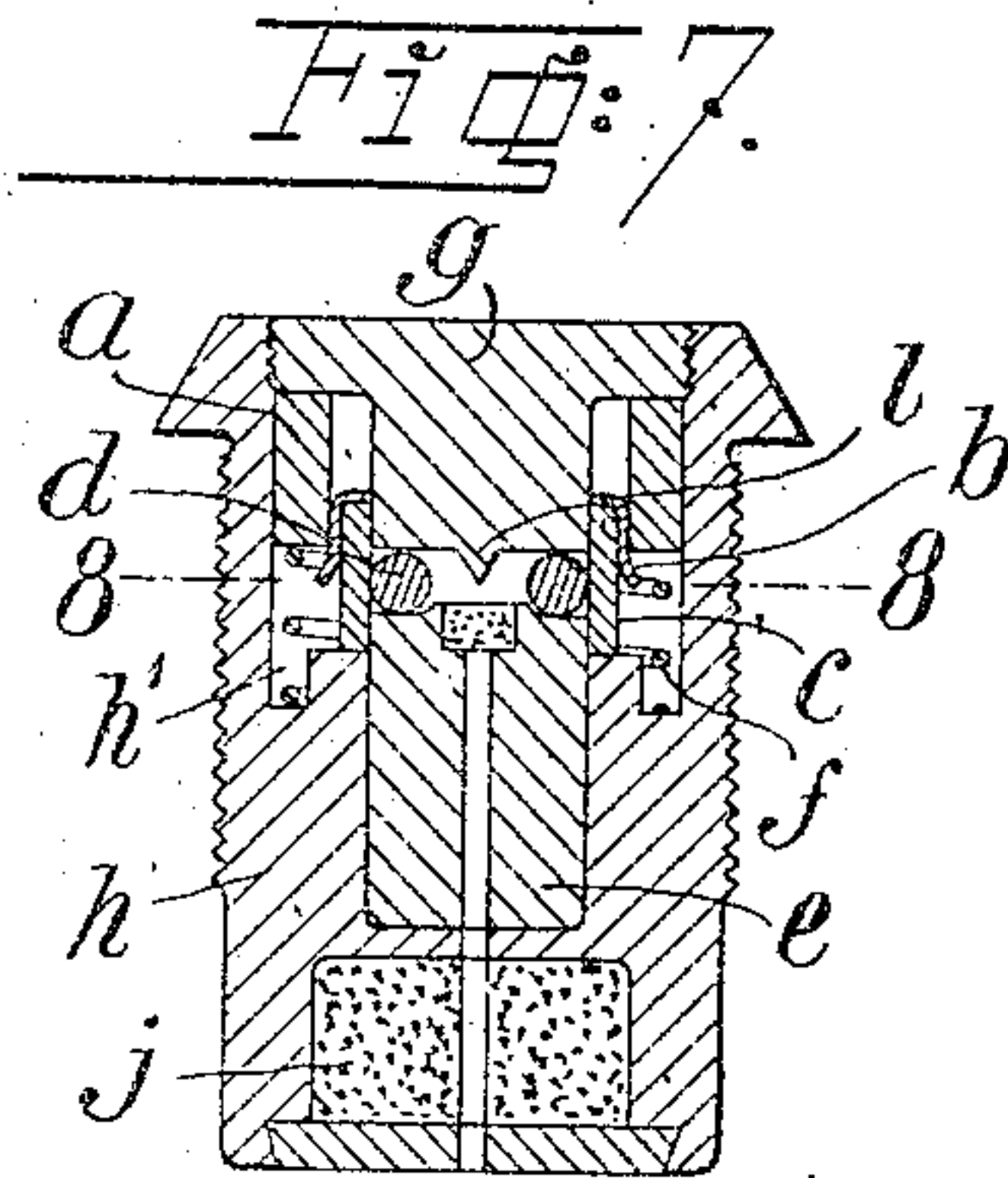
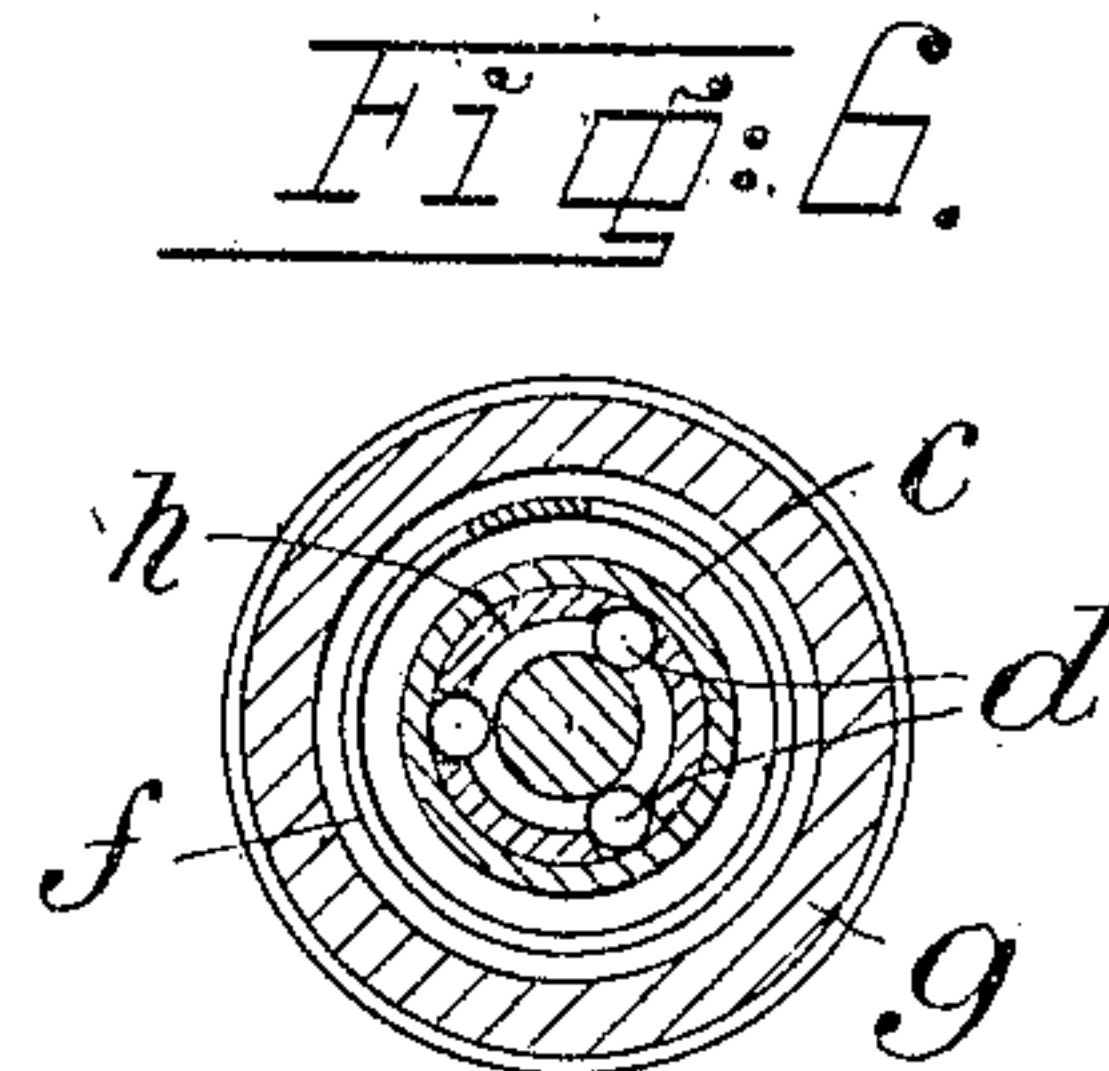
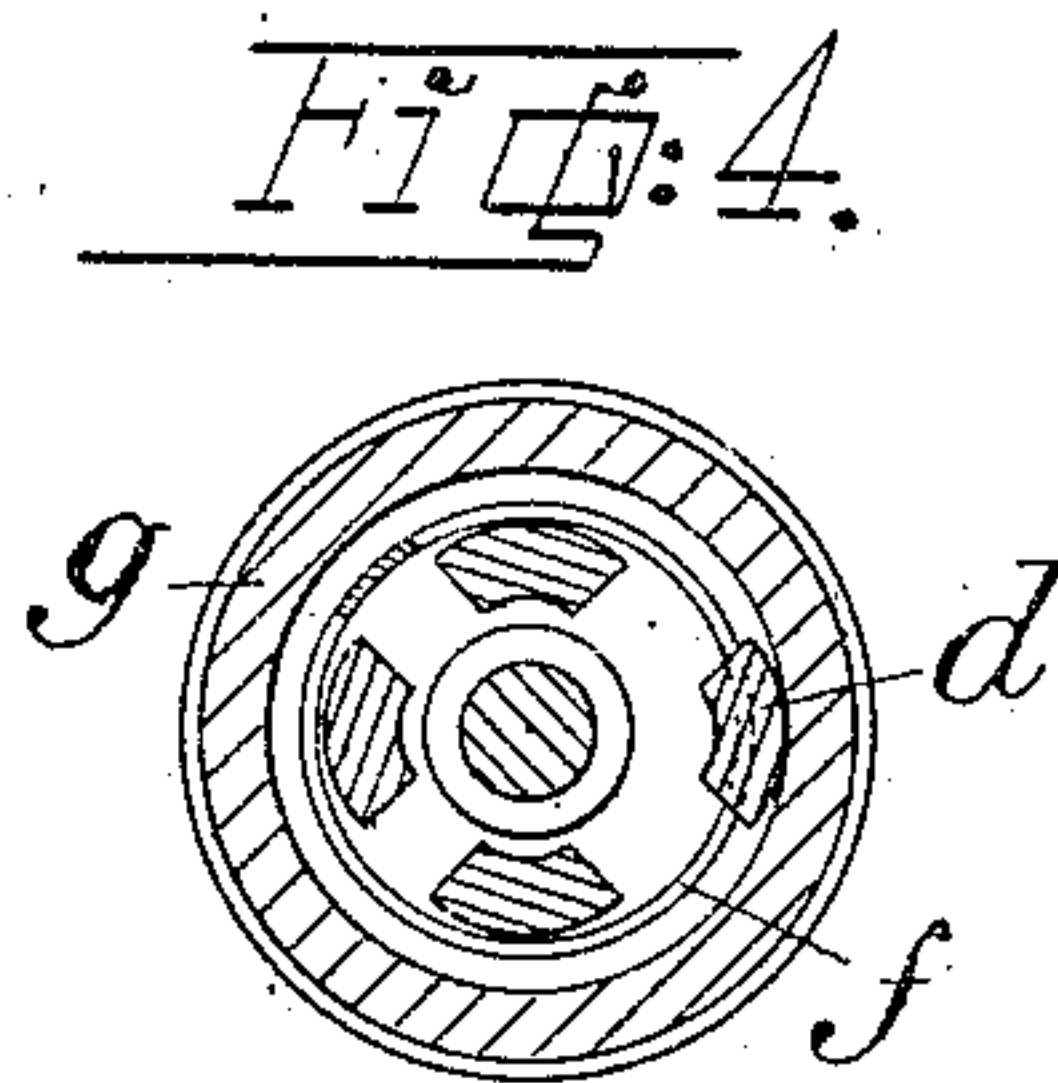
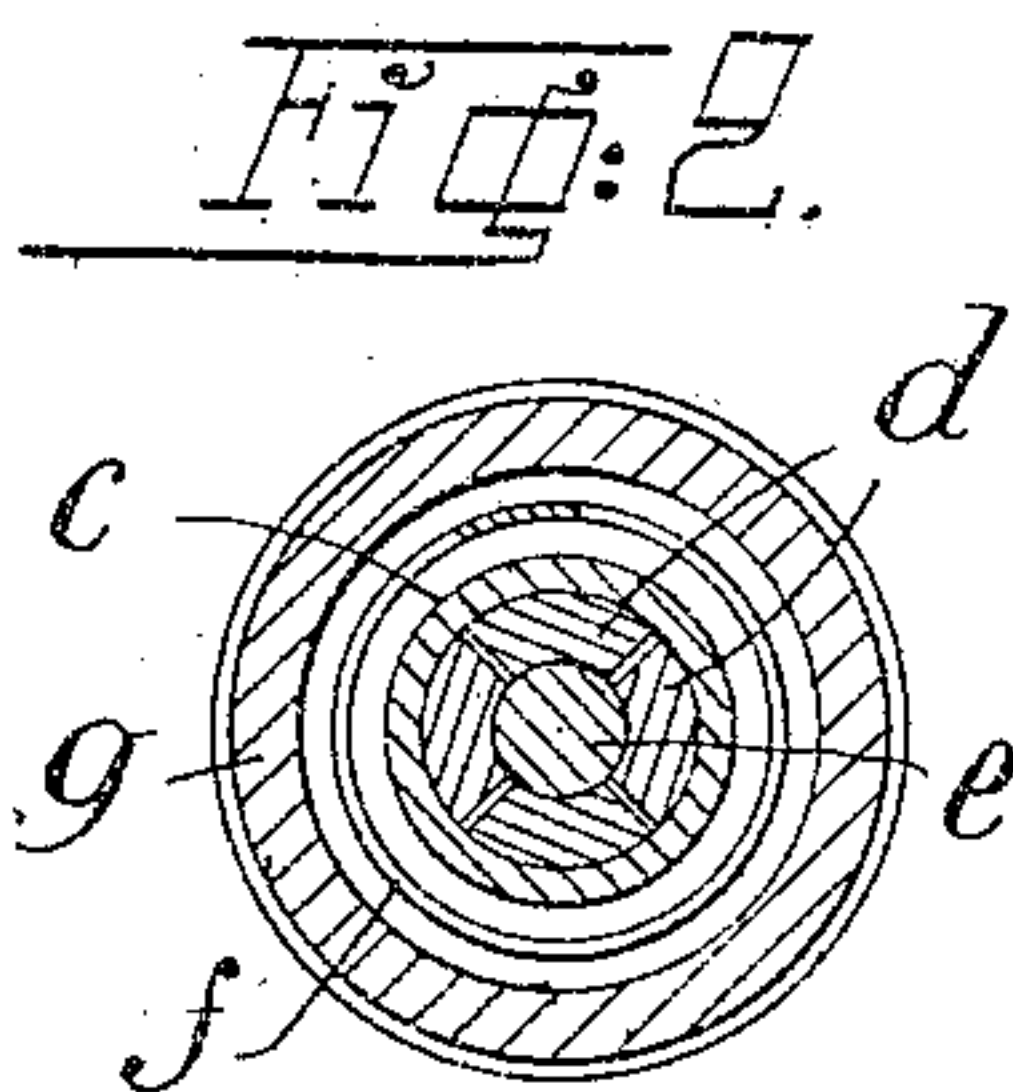
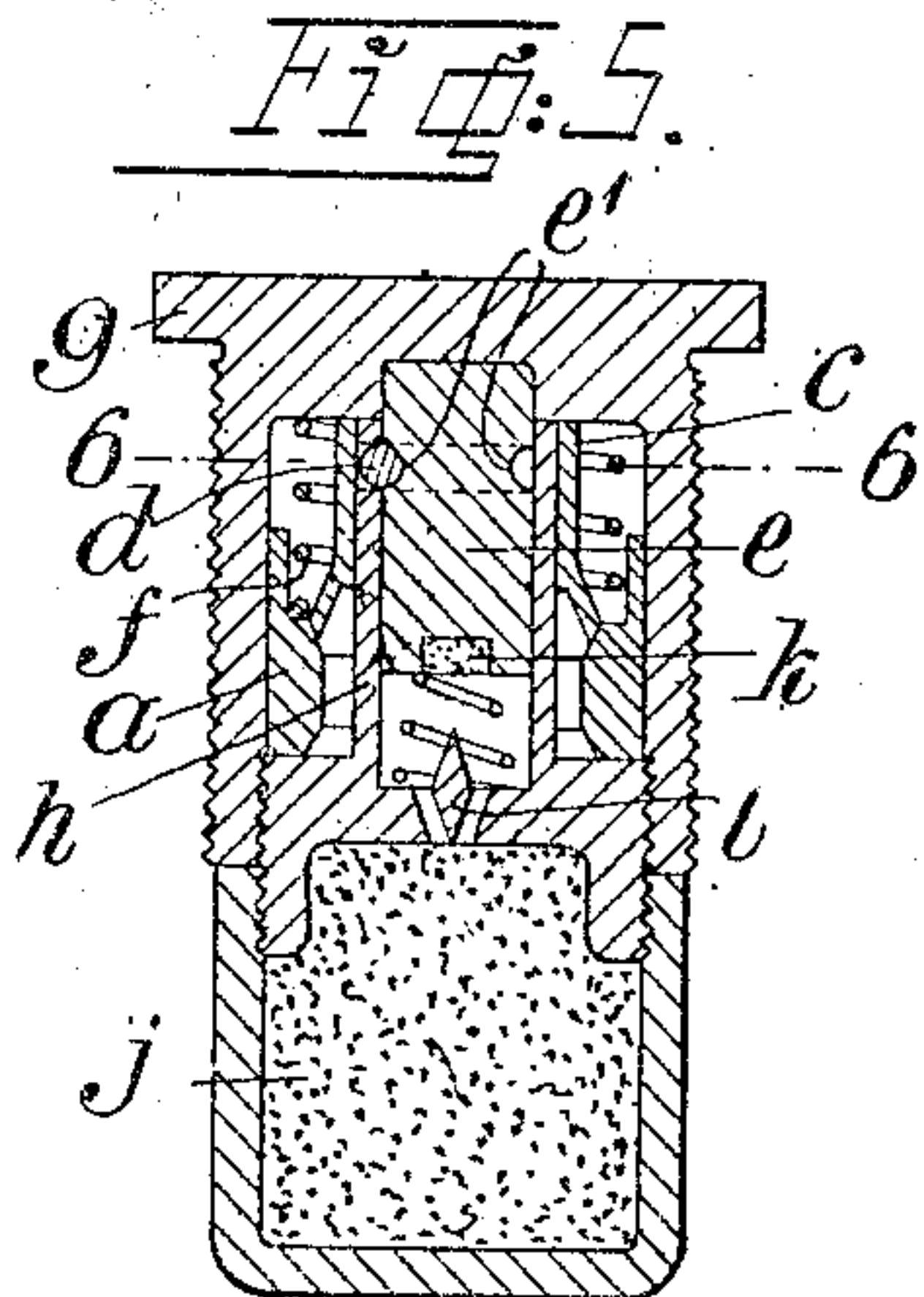
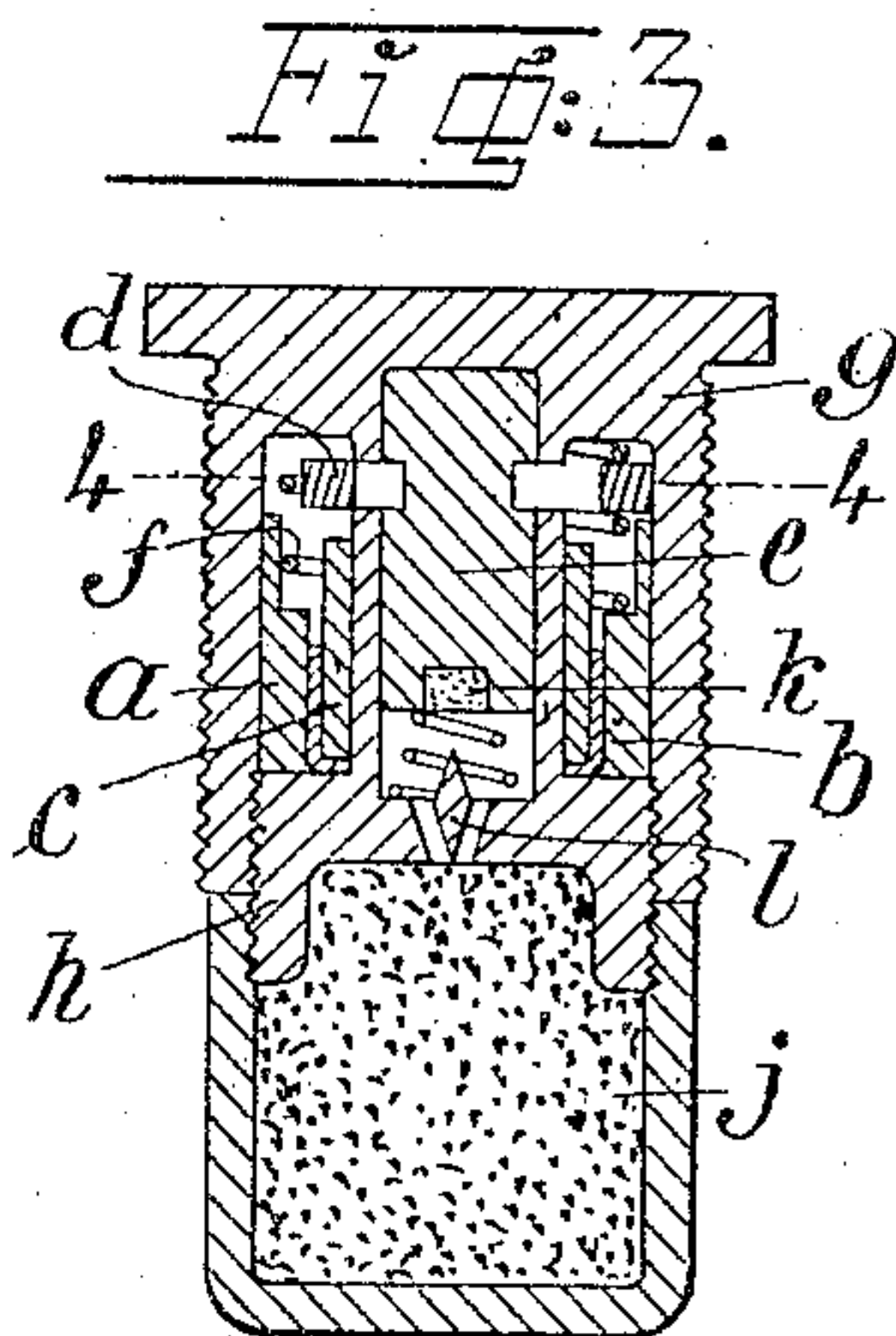
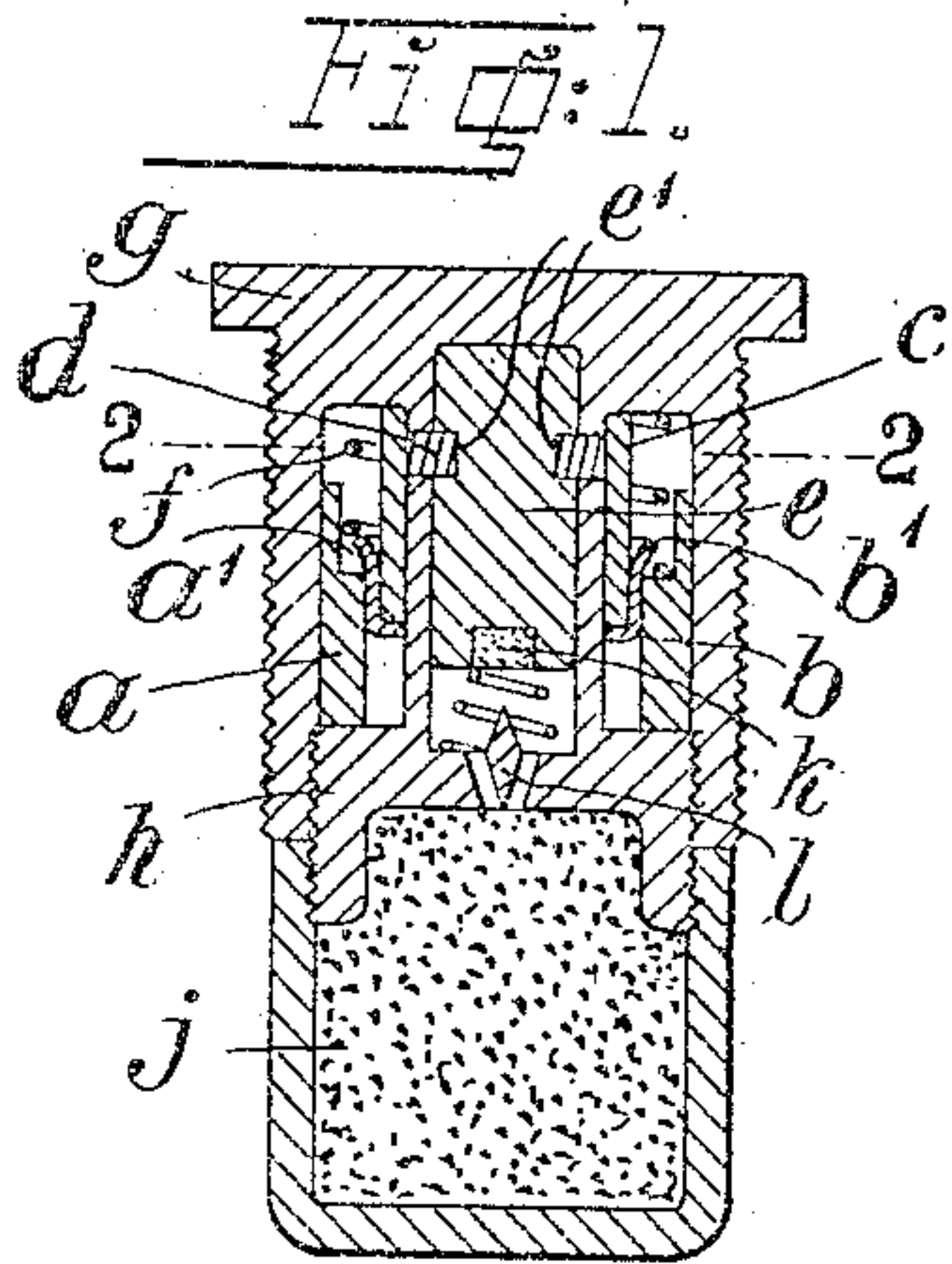


R. SOHLMAN, H. NORDENFELT & H. MOREN.  
FUSE FOR SHELLS WITH SAFETY DEVICE.

APPLICATION FILED SEPT. 1, 1910.

999,268.

Patented Aug. 1, 1911.



WITNESSES

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# UNITED STATES PATENT OFFICE.

RAGNAR SOHLMAN, HENRIK NORDENFELT, AND HUGO MORÉN, OF BOFORS, SWEDEN.

FUSE FOR SHELLS WITH SAFETY DEVICE.

999,268.

Specification of Letters Patent.

Patented Aug. 1, 1911.

Application filed September 1, 1910. Serial No. 580,090.

To all whom it may concern:

Be it known that we, RAGNAR SOHLMAN, managing director, HENRIK NORDENFELT, assistant director, and HUGO MORÉN, engineer, subjects of Sweden, residing at Bofors, Sweden, have invented new and useful Improvements in Fuses for Shells with a Safety Device, of which the following is a specification.

10 The present invention relates to percussion fuses of the kind provided with a safety device of such a construction as to prevent the movable percussion member from being released before the acceleration  
15 of the projectile has ceased. For this purpose, the safety device comprises an outer and an inner ring, which are separated from each other by an elastic member and held in such a position, that the locking members  
20 for the movable percussion member are retained by the inner ring. On the discharge of the gun, the outer ring is moved over the inner on account of its inertia, hereby compressing a spring behind the ring, where-  
25 upon the elastic member will lock the rings together. When the acceleration has ceased, the compressed spring will move the rings now locked together forward to such a position, as to permit the locking members to  
30 release the movable percussion member (hammer) under the action of the centrifugal force.

The invention is applicable to base fuses as well as point fuses.

35 In the accompanying drawing some forms of the invention are illustrated, Figure 1 showing a base fuse in an axial longitudinal section and in safe position; Fig. 2 is a cross section on the line 2—2 in Fig. 1, Fig. 3 a view corresponding to Fig. 1 immediately  
40 before the striking against the butt, Fig. 4 a section on the line 4—4 in Fig. 3, Fig. 5 an axial longitudinal section of another form of fuses in safe position, Fig. 6 a section on the line 6—6 in Fig. 5, Fig. 7 a longitudinal section of a form of point fuse in safe position, Fig. 8 a section on the line  
45 8—8 in Fig. 7 and Fig. 9 still another form of a point fuse in safe position, shown in an axial longitudinal section.

50 In the constructional form shown in Figs. 1—4, the hammer *e* carrying the percussion cap *h* is movable in a bore in the tubular piece *k* carrying the point *l*. The locking  
55 members here consist of four ring quadrants *d* partly embraced by an annular

groove *e'* in the hammer *e* and also filling up the space between the fuse head *g*, the part *h*, and the ring *c*, which latter is pressed against the fuse head by the elastic member  
60 *b*, said member also pressing the ring *a* against the part *h*. The ring *a* is turned down at *a'* for receiving the coiled spring *f*, when the ring is pressed against the fuse head *g*. 65

On the discharge of the gun, the ring *a* is moved over the ring *c* against the head *g*, hereby compressing not only the spring *f*, but also the curved ends *b'* of the elastic member *b*. When the acceleration has  
70 ceased, the ring *a* is moved forward by the spring *f*, in which movement the ring *c* will partake on account of the elastic member *b*, the quadrant *d* as a result being thrown out by the centrifugal force (Figs. 3 and 4) 75  
and releasing the hammer *e*, which on striking against the butt will press the percussion cap against the point *l* and ignite the detonator *j*.

In the constructional form shown in Figs. 5 and 6, the locking members *d* consist of balls, at least two in number, half of each of the balls being embraced by the groove *e'*  
80 in the hammer *e*. Their other halves are embraced by suitable holes in the part *h*. 85  
The resilient member between the rings *a* and *c* here consists of a projection of the ring *c*.

In the form shown in Figs. 7 and 8 the locking members *d* (consisting of balls) are  
90 placed between the hammer *e* and the part *g* carrying the igniting point *l*. On account of the annular projection around the percussion cap the balls *d* are prevented from touching the said cap. A cylindrical recess  
95 *h'* in the part *h* here embraces the spring *f*, when the ring *a* is placed against the said part *h*.

In the form shown in Fig. 9, the hammer *e* is rigidly secured to the detonator *j*,  
100 whereby a greater weight of the hammer is obtained and consequently a higher degree of sensibility on striking against the butt. The part *h*, at its lower end, is formed with a flange *m* receiving the pressure from the  
105 ring *c* and the spring *f*. The mantle *i* of the fuse, in its front part, has a larger inner diameter, and the shoulder *i'* thus formed will receive the ring *a*, when this part is  
110 moved at the discharge of the gun. The compressed spring *f* lies between this shoulder *i'* and a flange *m*.



Having now particularly described the nature of our invention and the manner of its operation, what we claim is:

1. A shell fuse comprising stationary and 5 movable percussion members, locking members engaging recesses in the latter and resting against a fixed stop, a longitudinally slidable ring normally resting against a fixed stop at its front end under the action 10 of a spring, another ring capable of being telescoped relatively to the first-named one, an elastic member normally holding the second ring in such position relatively to the first one as to surround the locking members 15 of the movable percussion member, but permitting the first-named ring to move backward on the discharge of the gun so as to compress the said spring and deform the said elastic member, both rings being pressed 20 forward by the action of said spring after the acceleration of the projectile has ceased and permitting the locking members to be released by centrifugal action.

2. A shell fuse comprising stationary and 25 movable percussion members, locking members engaging recesses in the latter and resting against a fixed stop, a longitudinally slidable ring normally resting against a fixed stop at its front end under the action 30 of a spring, another ring capable of being telescoped relatively to the first-named one, a dish-shaped ring with elastic wings nor-

mally holding the second ring in such position to the first one as to surround the locking members of the movable percussion 35 member but permitting the telescoping of the said two rings and then retaining them in their new mutual position.

3. A shell fuse comprising a stationary member carrying a percussion point and a 40 movable member carrying a percussion cap and a main detonator, locking members engaging said movable members and resting against a fixed stop, a longitudinally slidable ring normally resting against a stop at 45 its front end under the action of a spring, another ring capable of being telescoped relatively to the first-named one, and an elastic member normally holding the two rings in such mutual position, that the latter one will 50 surround the locking pieces of the movable percussion member, but permitting such movement of the said rings, under the action of the initial thrust and the said spring, as to release the said locking members. 55

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

RAGNAR SOHLMAN.  
HENRIK NORDENFELT.  
HUGO MORÉN.

Witnesses:

H. TCLAUDER,  
D. DAHLSTRÖM.