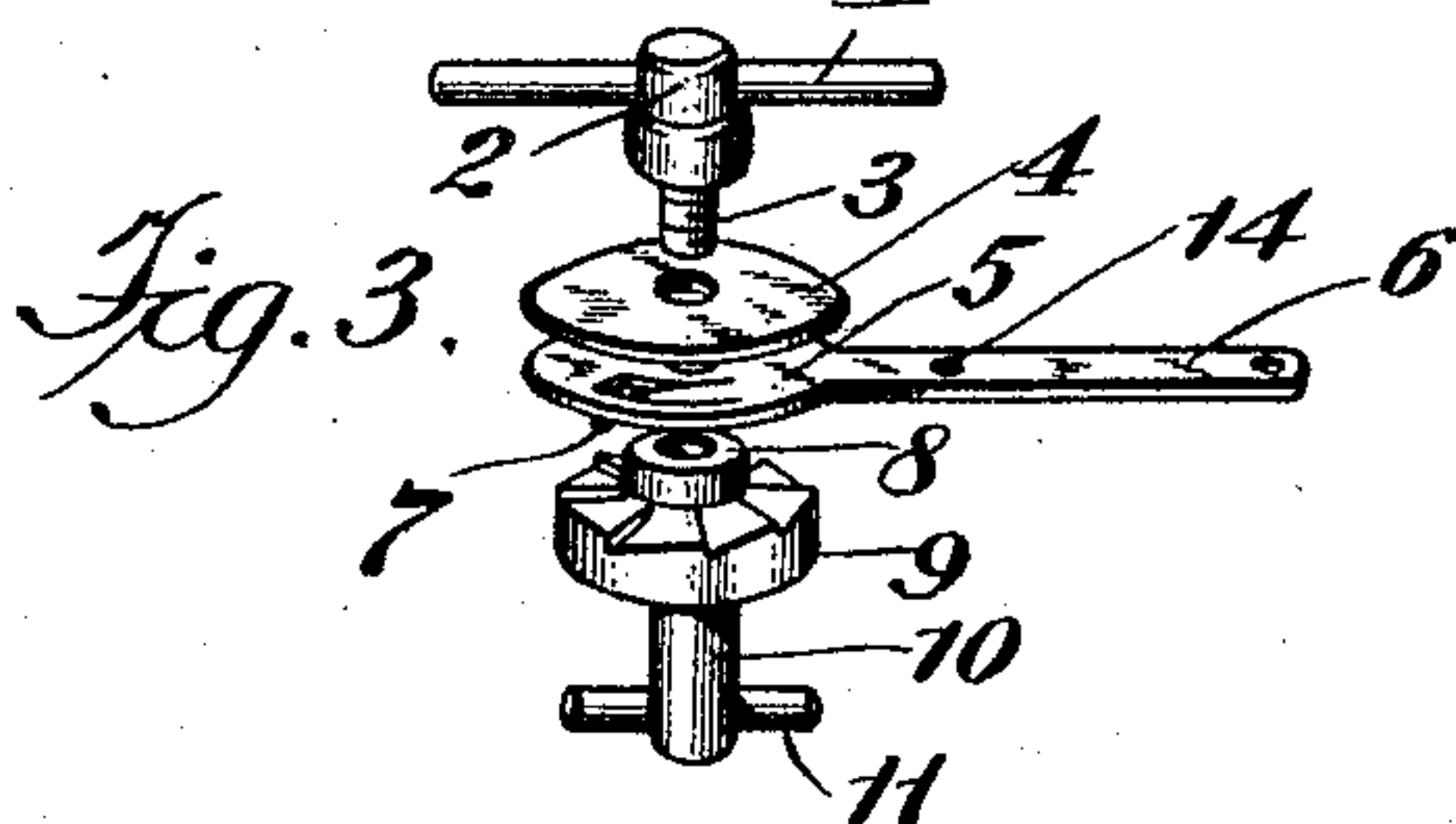
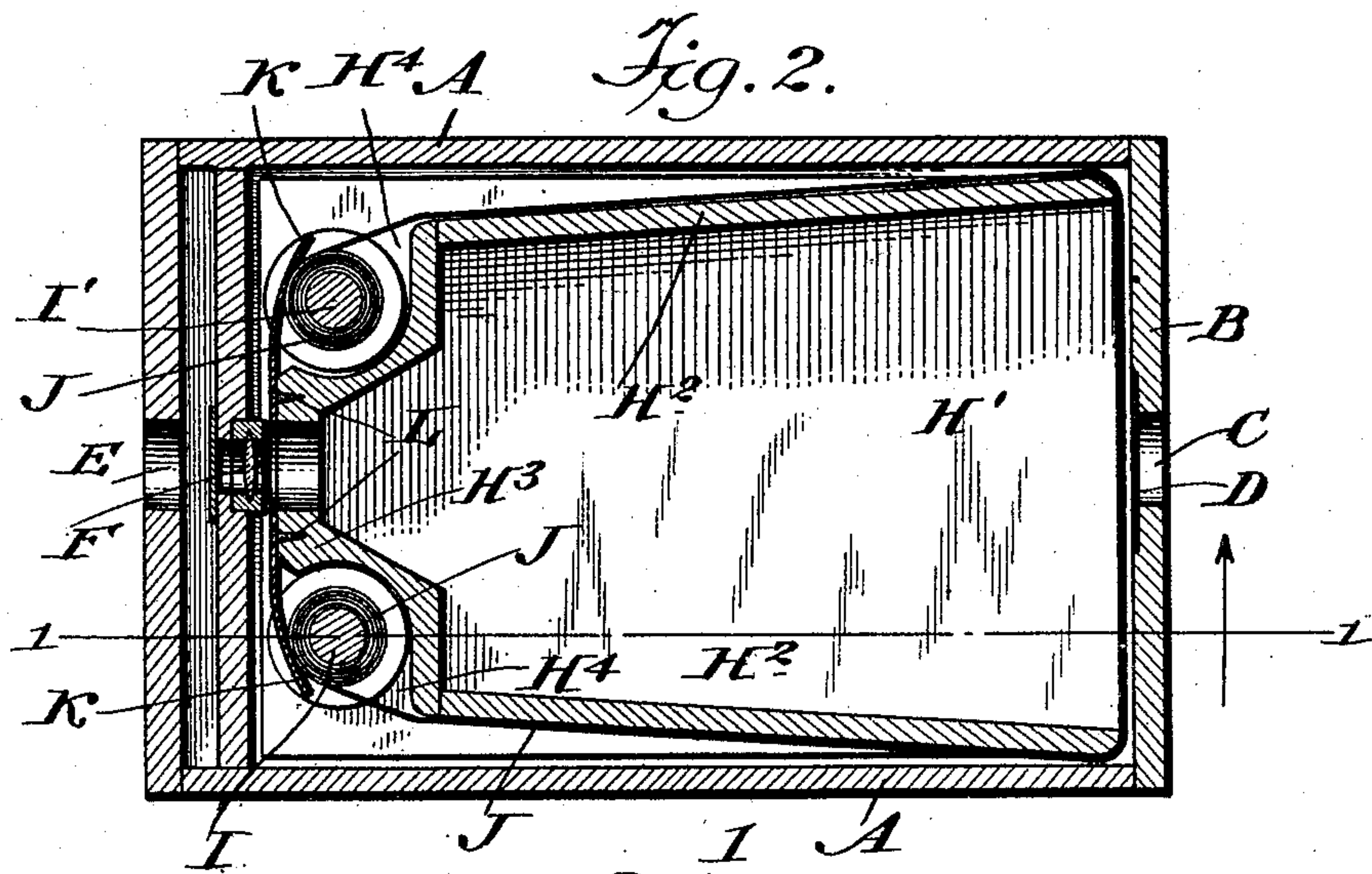
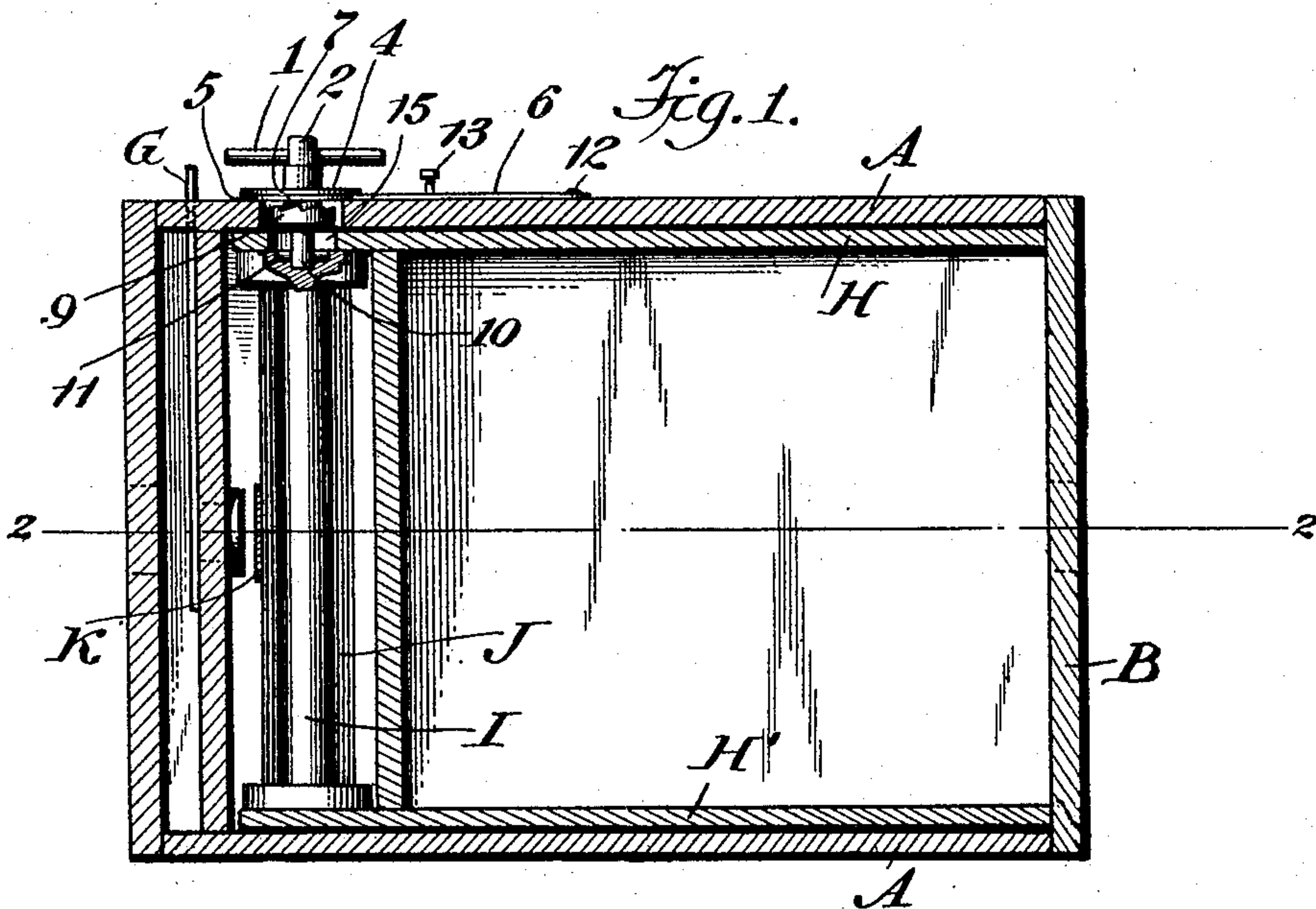


No. 775,261.

PATENTED NOV. 15, 1904.

C. BORNMAN.  
PHOTOGRAPHIC CAMERA.  
APPLICATION FILED JULY 23, 1904.

NO MODEL.



Witnesses  
*A. Appleman*  
*F. M. Donbach*

Inventor  
*Carl Bornmann.*  
By his Attorney *Phillips Abbott*



# UNITED STATES PATENT OFFICE.

CARL BORNMAN, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE ANTHONY & SCOVILL COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

## PHOTOGRAPHIC CAMERA.

SPECIFICATION forming part of Letters Patent No. 775,261, dated November 15, 1904.

Application filed July 23, 1904. Serial No. 217,806. (No model.)

*To all whom it may concern:*

Be it known that I, CARL BORNMAN, a citizen of the United States, and a resident of the city of New Haven, county of New Haven, and State of Connecticut, have invented certain new and useful Improvements in Photographic Cameras, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 illustrates a longitudinal vertical section of a camera embodying my invention, taken on the line 1 1 of Fig. 2. Fig. 2 illustrates a longitudinal horizontal section on the line 2 2 of Fig. 1. Fig. 3 illustrates a perspective of the parts composing the winding apparatus and tension device.

A represents the exterior box of the camera; B, a door at the rear which may be hinged or otherwise removably attached thereto; C, the peep-hole, which is covered with non-actinic celluloid D or its equivalent; E, the exposure-opening; F, the lens; G, the lever, which actuates the shutter, the shutter mechanism not being shown. The camera is composed of a removable interior frame, as usual in such devices, embodying top and bottom pieces or boards H and H', angularly arranged side pieces or boards H<sup>2</sup> H<sup>2</sup>, and an end piece or block H<sup>3</sup>, provided with semicircular recesses H<sup>4</sup>, adapted to receive the flanged spools I and I', the former being the receiving and the latter the supply spool. The film and black paper are shown at J. The parts as thus far described are or may be of any preferred construction.

The features more particularly involved in the present invention are as follows:

In order that the supply and receiving spools may be held snugly within the recesses H<sup>4</sup> H<sup>4</sup> provided for them and necessary tension or braking action applied upon them to secure the proper movements of the film, I provide a flat spring K, which may be fastened, as by screws L or in any other preferred manner, to the front of the block H<sup>3</sup>. The ends of the spring, being resilient, may be lifted or

pressed forwardly during the insertion and removal of the spools, and they in operation rest with requisite pressure upon the outer surface of the black paper, thus retarding the rotation of the spools, as above suggested.

The supply-spool has no axes—that is to say, none are necessary—for it will revolve upon its heads or flanges within the recess H<sup>4</sup>, in which it rests, when the black paper and film are drawn from it by the action of the winding mechanism applied to the receiving-spool, and the receiving-spool likewise need have no axis at its lower end, for it likewise being properly held by the pressure of the spring K and the sides of the recesses in which it rests will suitably revolve under the action of the winding mechanism. The winding mechanism, however, in a sense affords the axis for the upper end of the spool and in construction and operation is as follows, special reference being had to Fig. 3, in which the several parts which may compose it are shown slightly separated from each other for clearness in understanding the construction. It will of course be understood that when the parts are in operative condition they are properly assembled and arranged relative to each other, as shown in Fig. 1. In Fig. 3, 1 is the thumb-piece of the winding mechanism, composed of a bar which passes through a hub 2, having a downwardly-extending threaded part 3, which passes through a flat disk 4, the function of which is to act as a cover for the underlying part 5, the rear edge 6 of which constitutes the spring, from which spring a spring-pawl 7 is cut. The threaded stem 3 enters a hole, as shown, in a hub 8, immediately below which is a horizontally-faced ratchet-wheel 9, below which extends a stem 10, having a short cross-bar 11 at or near its end, which enters a correspondingly-shaped transverse recess in the upper and outer surface of one of the flanges of the receiving-spool. The operation of these parts when properly assembled is clearly illustrated in Fig. 1—that is to say, a screw 12 fastens the rear end of the spring 6 to the outside



of the camera-box A. Another headed pin or screw 13 passes through a hole 14 made in the spring-bar 6, so that when the thumb piece or bar 1 is taken hold of by the thumb and finger of the operator the entire winding mechanism may be pulled upwardly and away from the surface of the camera-box J, during which operation of course the spring-bar 6 is flexed until further movement is resisted by the head on the pin or screw 13, which comes in contact with the upper surface of the spring-bar 6, and when the parts have reached this position it will be found that the cross-bar 11 on the lower end of the stem 10 and the terminal end of that stem also have been lifted clear from the slight depression in the outer surface of the flange of the receiving-spool and also have passed through an opening 15 made in the upper board H of the interior removable frame, so that the frame may then upon opening the rear door B of the camera be dropped out therefrom for removing the exposed film and inserting a new cartridge.

The extreme simplicity and efficiency of the construction is obvious. The interior removable frame is held in its place snugly by the closing of the rear door B, and when that door is opened it cannot accidentally drop out, which might result in the fracture of some part, until the winding apparatus has been lifted, as above stated. The winding apparatus itself is of exceedingly simple and inexpensive construction, inasmuch as the ratchet-wheel may be made by a single blow from a properly-constructed die which will strike up the ratchet-teeth thereof, and the spring-pawl 7 may be cut from the plate 5 by the same blow of the die which cuts out that part itself. It is not essential that the upper frame 4 be used; but I prefer to use it, since thereby it cuts off all possibility of entrance of light to the camera through the opening made by the cutting out of the spring-pawl 7 and also acts as a finish, which greatly improves the appearance of the device. The spring K in a most simple and efficient manner holds the spools in proper position and supplies all requisite tension thereto.

Obviously the spring K need not apply tension upon the receiving-spool, although I prefer it to do so upon both spools, as above stated.

It will be obvious to those who are familiar with this art that many modifications may be made in the detail of construction of the parts composing the invention without departing from the essentials thereof. Consequently I do not limit myself to such details.

I claim—

1. The combination in a camera having an exterior casing and an interior removable film-carrying frame of a winding mechanism spring-supported on the exterior casing of the

camera and which is held in engagement with the receiving-spool and inner removable frame by the spring and disengaged therefrom by outward movement against the stress of the spring.

2. The combination of a winding mechanism embodying a spring, whereby the mechanism is supported upon the outside of the camera, a ratchet-wheel and axis provided with a cross-bar, and a pawl to engage the ratchet-wheel, said pawl being cut from the part composing the supporting-spring.

3. The combination in a camera of a ratchet-wheel having teeth upon its flat surface, an axis provided with means to engage the receiving-spool to which the ratchet-wheel is attached, a thumb-piece or winding device on the outside of the camera, a spring which supports all of said parts, whereby they are normally held in their inward position, but adapted to outward movement for disengagement of the receiving-spool, a pawl cut from the spring and which engages with the ratchet and a stop to limit the outward movement of the spring.

4. In a camera having an exterior casing and an interior removable film-carrying frame, a spring-supported winding mechanism adapted to be engaged with and disengaged from the receiving-spool by the movement of the parts through the side of the camera and of the inner frame.

5. In a camera having an exterior casing and an interior removable film-carrying frame the combination of winding mechanism which is engaged with and disengaged from the receiving-spool by movement through the side of the camera and inner frame, whereby the inner frame is held in position by said winding mechanism until the same be moved outwardly.

6. The combination in a camera of a removable inner frame provided with recesses adapted to receive the spools, and a spring adapted to hold the spools in their recesses and to apply tension upon the supply-spool.

7. The combination in a camera of flanged spools and an interior removable frame provided with recesses adapted to receive the flanges of the spools and permit the spools to revolve therein on said flanges and a spring which revolubly holds the spools within their respective recesses.

8. The combination in a camera of an interior removable frame provided with a recess for the reception of the receiving-spool, a spring to hold the spool within said recess and a winding mechanism provided with a supporting-spring which automatically engages the appropriate part of the winding mechanism with the appropriate part of the receiving-spool.

9. The combination in a camera of winding mechanism embodying a spring which supports the winding mechanism, a ratchet-wheel

with teeth on its flat surface, a spring-pawl  
which engages with the ratchet cut from the  
same part which constitutes said supporting-  
spring, a device for engaging the receiving-  
5 spool located below the ratchet and a thumb  
piece or bar on the exterior of the camera,  
whereby the winding mechanism may be  
turned.

In testimony whereof I have signed my name  
to this specification in the presence of two sub- 10  
scribing witnesses.

CARL BORNMANN.

Witnesses:

W. TRUEMAN,  
JOHN ELLIOTT.