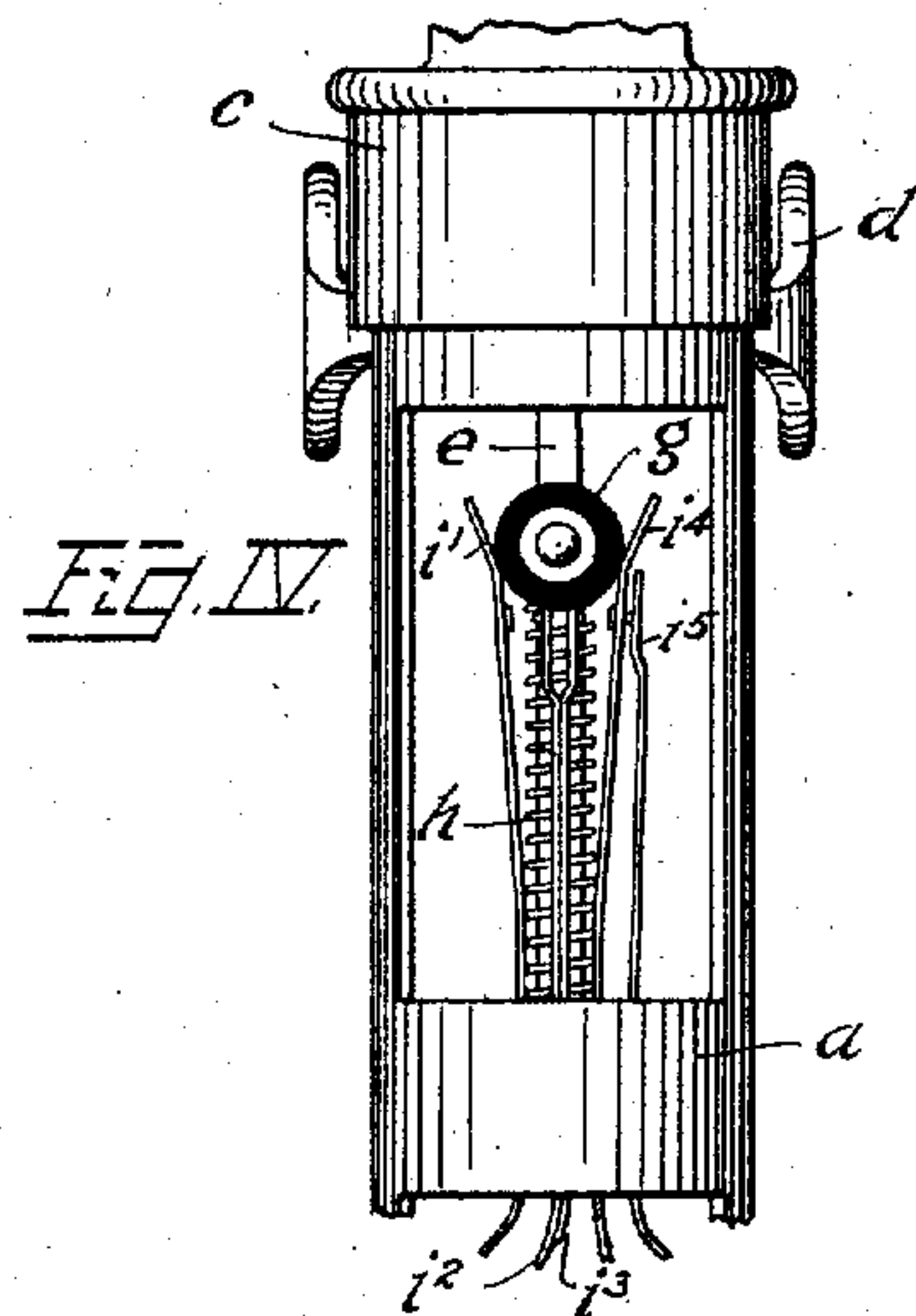
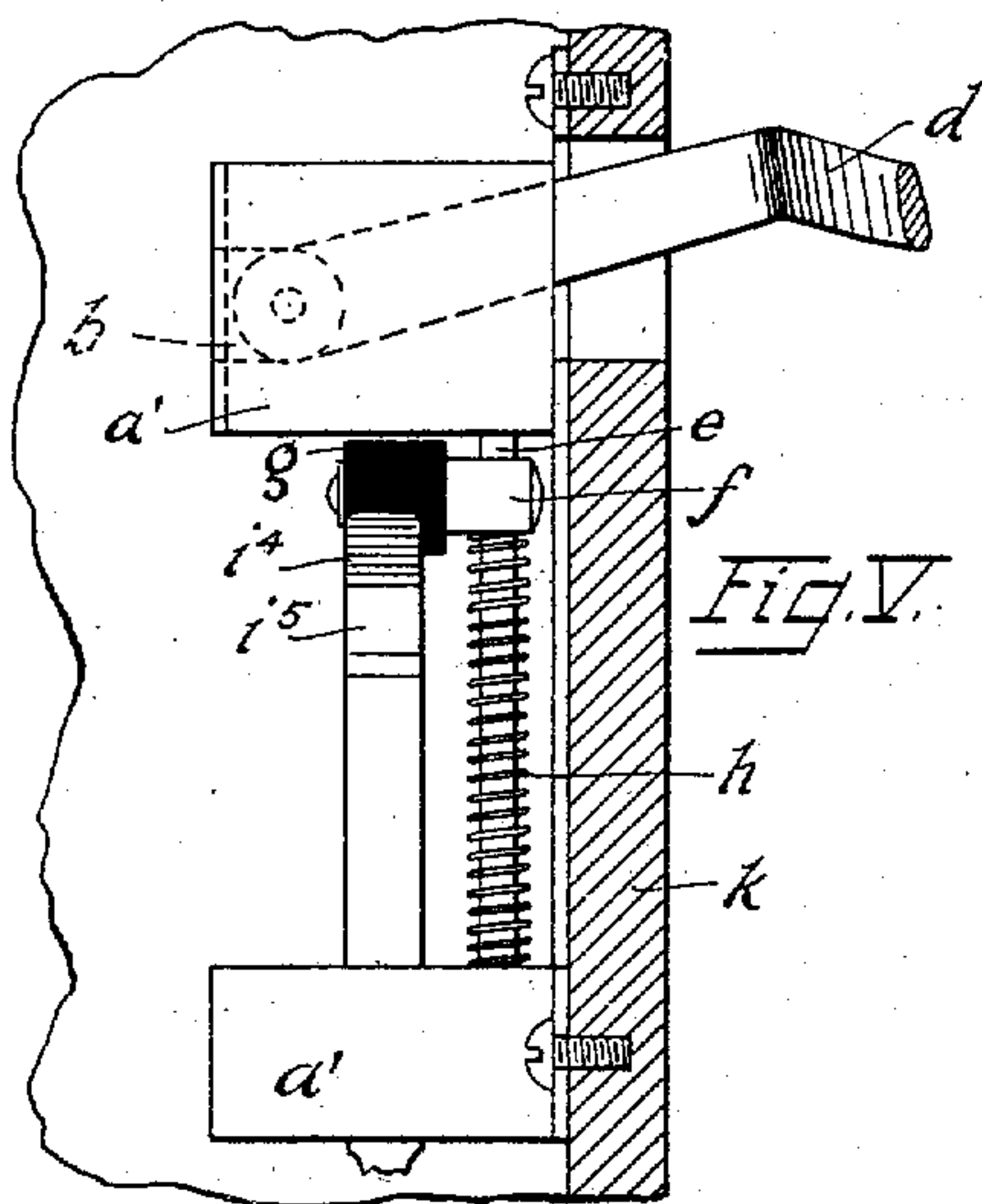
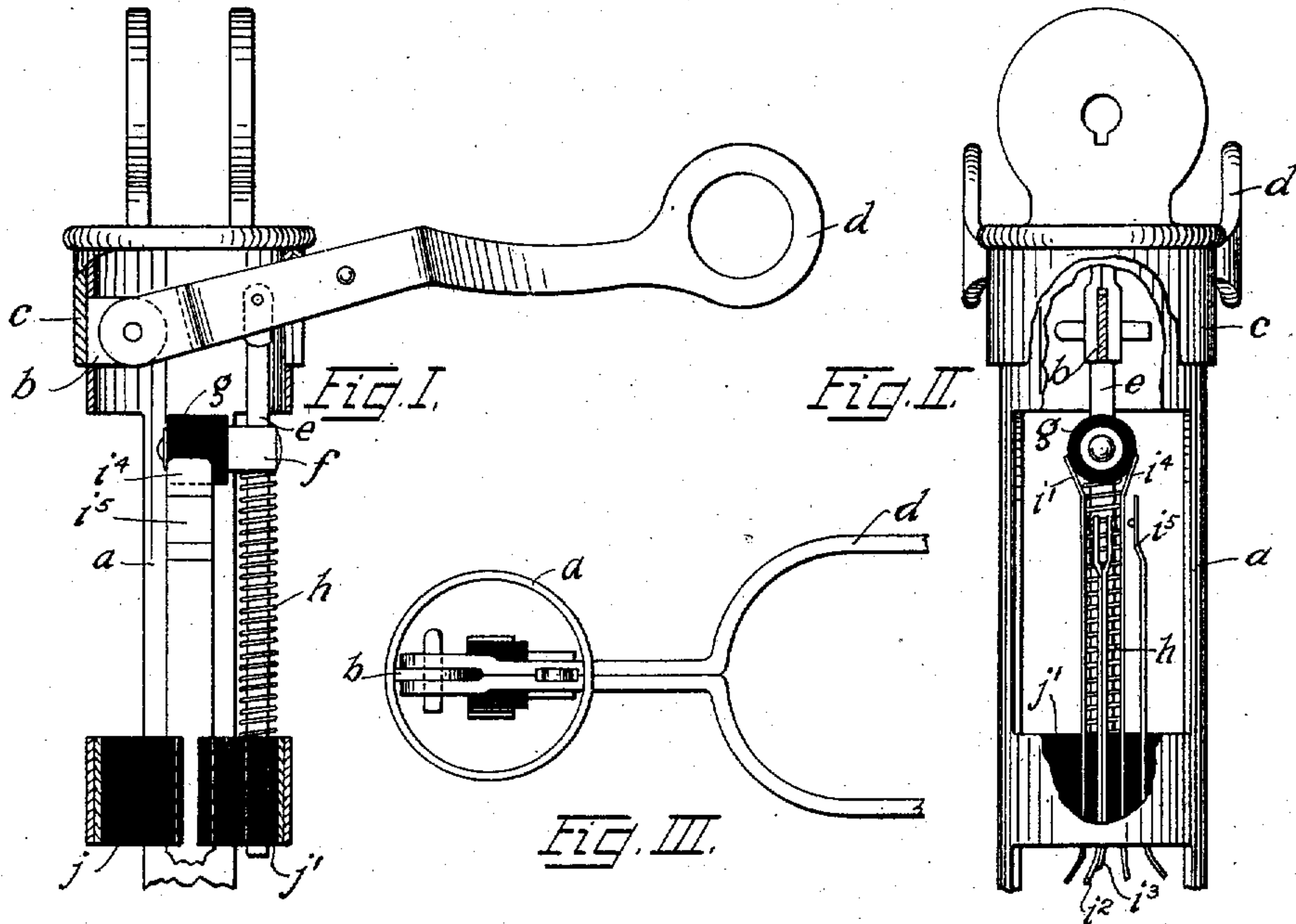


No. 885,348.

PATENTED APR. 21, 1908.

H. L. KNIGHT.
TELEPHONE HOOK SWITCH.
APPLICATION FILED APR. 13, 1906.



Witnesses:

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UNITED STATES PATENT OFFICE.

HERBERT L. KNIGHT, OF CLEVELAND, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO CENTURY TELEPHONE CONSTRUCTION COMPANY, OF BUFFALO, NEW YORK, A CORPORATION OF NEW YORK.

TELEPHONE-HOOK SWITCH.

No. 885,348.

Specification of Letters Patent.

Patented April 21, 1908.

Application filed April 13, 1906. Serial No. 311,410.

To all whom it may concern:

Be it known that I, HERBERT L. KNIGHT, a citizen of the United States of America, and a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Telephone-Hook Switches, of which the following is a specification.

My invention relates to improvements in telephone-hook switches, and has for its object, the construction of an electric switch mechanism which shall be very simple, extremely compact and absolutely positive in its operation.

The apparatus of my invention is especially well adapted for use in connection with telephone desk-sets; the same permitting of such close mounting as to adapt it especially for use within the tubular standards of such instruments. Moreover, the mode of constructing and operating the contact-spring actuating-mechanism is such, that the springs may be disposed very close to the telephone-hook, or they may be mounted at a distance therefrom, and be equally well under the control of the switch-hook. By reason of the employment of an insulating part which engages one or more of the springs, or preferably enters between two opposing springs, to separate them, and establish other contacts, if desired, the positive action of the springs and control of the connected circuits is insured.

Briefly stated, my invention consists in providing in association with the telephone-hook or other pivoted member, a plunger adapted to be vertically moved thereby. Upon said plunger is mounted a coiled spring, which may serve to move the telephone-hook and the contact spring-actuating member in one direction. This actuating member is positioned upon the plunger, and comprises a suitably shaped sleeve or part formed of insulating material, which is adapted to be entered between the upwardly extending ends of the actuated contact-springs, which are mounted with their inner contacts in a vertical position within an insulating base. The improvement is well adapted for use in telephone-sets, especially where the saving of space is required.

I have illustrated embodiments of my im-

proved construction, in the accompanying drawings, wherein;—

Figure I. is a partial view in side elevation of the standard of a telephone desk-set mounting my improved telephone-hook switch. Fig. II. is another view in side elevation, at right angles to the first, further illustrating details of my construction. Fig. III. is a top view of the same, with the cap removed from the standard. Fig. IV. is a side elevation similar to that of Fig. II., but with the contact-springs in the position assumed when the telephone receiver is upon its hook; and, Fig. V. is a view in side elevation, showing my improved switch constructed for use in a telephone box.

Throughout these several figures of the drawings, I have designated similar parts by the same character of reference, in order to avoid any confusion or ambiguity.

A tubular casing or frame *a*, forms the inner standard of the desk-set, and mounts at its upper end, a cap *c*, for carrying the transmitter between the upwardly extending lugs or ears thereon. Upon a bracket *b*, interiorly extending from the casing *a*, there is pivotally mounted the well known form of switch-hook *d* of short arm type. It will be observed, however, that said switch-hook omits the usual bell-crank or angular extension, and makes or breaks none of the contacts directly. Preferably, this part is formed of two symmetrical punchings riveted together, and is pivoted just within the casing to a plunger *e*, which carries a laterally extending actuating member *f*, provided with a sleeve or insulating material *g*, for engagement with the contact-springs. A coil-spring *h* is mounted upon the stem of the plunger, and serves normally to maintain the switch-hook and actuating member in their elevated positions. Two semi-circular blocks *j*, *j*¹, of insulating material, are carried in the casing a short distance below the switch-hook, and serve not only to mount the several contact-springs *i*¹—*i*⁵, by means of saw-cuts in said block and shoulders provided upon the springs, as shown in Fig. I., but the plunger also is accommodated and guided by the vertical bore provided in the right hand block. These contact-springs, obviously, may vary in number and arrangement, but in the form shown, the springs *i*¹

and i^4 are provided with upwardly diverging ends which are adapted to engage with the insulating sleeve g of the actuating member, and normally make electrical contact with the inner springs i^2, i^3 . Also, an exterior contact-spring i^5 is provided, with which the contact-spring i^4 is moved into engagement upon the depression of the switch-hook; said spring i^4 and contact-spring i^1 simultaneously being actuated out of engagement with the inner contact-springs by the downward movement of the insulated actuating member, and thereby making and breaking respectively the controlled circuits. The operation will be perfectly understood by referring to Figs. II. and IV., which show respectively, the parts in the normal position for talking with the telephone receiver removed from the switch-hook, and in the condition assumed by the several parts when the receiver (not shown) is placed upon its switch-hook.

The construction shown in Fig. V., scarcely needs any description, since the parts and their arrangement are very similar to those already set forth. The frame or casing a' , however, differs slightly in that lugs are formed above and below thereon, for accommodating the screws which serve to secure the device in position upon the interior of the telephone box k , or in any desired location.

The construction is so compact that the other necessary apparatus, as induction coils, bell-magnets, etc., may be mounted within the box; the whole occupying much less space than is required with the ordinary types of switch-hooks in use. Merely by lengthening the plunger, it is quite apparent that the contact-springs may be positioned at a distance from the switch-hook, and be operated with equal certainty. Those acquainted with telephone practice will also perceive that the apparatus shown, may be mounted in much closer compass than is depicted even in the drawings showing the full sized apparatus. This is largely due to the fact that all of the apparatus may be disposed in the same, or substantially the same vertical plane, while the movable switch-hook springs share equally in the displacement or play required for altering the controlled circuits, and said springs are positively actuated into and out of engagement or electrical contact by the wedge-like action of the actuating member carried upon the plunger. The springs, too, may be made very short, if required, without affecting their described functions.

Having now described apparatus embodying my invention, I claim as the novel features thereof, and desire to secure by Letters Patent, the following;—

1. In a telephone hook switch of the class described, the combination with a tubular casing, of a telephone-supporting switchhook

pivoted at one side of said casing, an insulating mounting positioned within the casing beneath said hook, closely assembled switch springs carried thereby in substantially parallel planes with their free ends extending upwardly, a plunger-part connected with the supporting switch hook and having vertical movement within the insulating mounting, a spring normally under tension to elevate or raise said hook, and a laterally extending insulated member carried by said plunger-part and adapted to actuate the contact springs into and out of electrical engagement, substantially as set forth.

2. In a telephone-hook switch adapted for positioning in restricted spaces, the combination with a frame or casing, of a transversely extending pivoted switch hook mounted therein, an insulating base below said switch hook, vertical contact springs carried thereby, a plunger-part connected above with said switch hook and freely movable within the insulating base, a laterally extending insulated member thereon positioned to engage and actuate the contact springs for altering their electrical relation, and a coiled spring mounted upon the stem of said plunger-part, re-acting upon said base and insulating member normally to elevate the switch hook, substantially as set forth.

3. In a telephone-hook switch, the combination with a sheet metal frame or casing, of a telephone-hook pivoted within the upper portion thereof, a plunger-part connected to be moved thereby, a laterally-extending actuating member thereon formed of insulating material, a spring under tension normally maintaining said parts in elevated position, and a plurality of contact springs disposed beneath and substantially in the plane of said hook, with which the actuating member is adapted to be brought into engagement to alter their electrical relations during the depression of the switch-hook, substantially as set forth.

4. In a telephone-hook switch adapted for positioning in desk-sets and the like, the combination with a sheet metal frame or casing, of a telephone-hook pivotally mounted therein, a plunger actuated thereby, a spring upon said plunger under tension normally to elevate the switch-hook, an actuating member laterally extending from the plunger and having an insulating sleeve, a plurality of contact springs adapted to be engaged and actuated into and out of contact by said sleeve during the movements of the plunger, the said parts being positioned substantially in the plane of movement of the telephone-hook, and an insulating mounting positioned within the casing for securely maintaining said contact springs in place, substantially as set forth.

5. In a telephone desk-set, the combination with the standard thereof, of a tele-

phone-hook pivotally mounted near the upper part of the standard, an insulating support positioned in the standard a short distance beneath the telephone-hook, a plurality of upwardly-extending, vertically positioned contact springs carried thereby, a vertically movable plunger connected to be moved by the switch-hook, and a laterally extending insulated member upon the plunger for securing the actuation of the contact

springs into and out of electrical engagement, substantially as set forth.

Signed at Cleveland, this 11th day of April, A. D. 1906, in the presence of two subscribing witnesses.

HERBERT L. KNIGHT.

Witnesses:

CHAS. S. BEARDSLEY,
J. D. MALLOY.