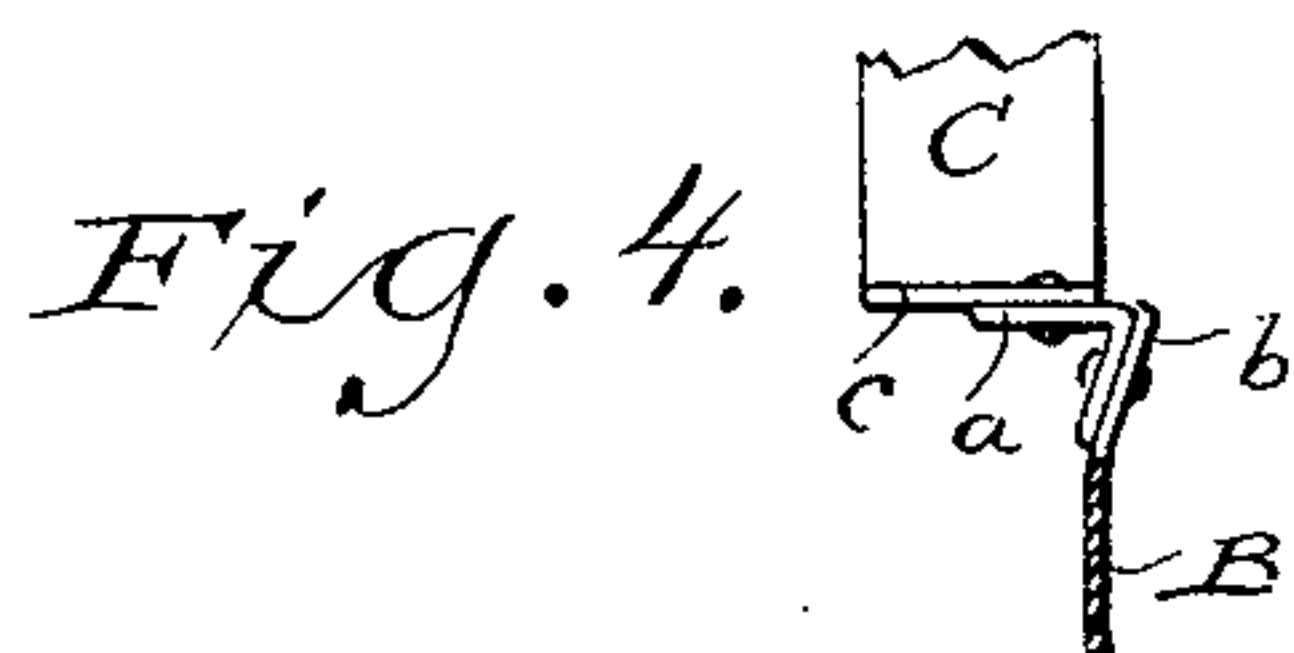
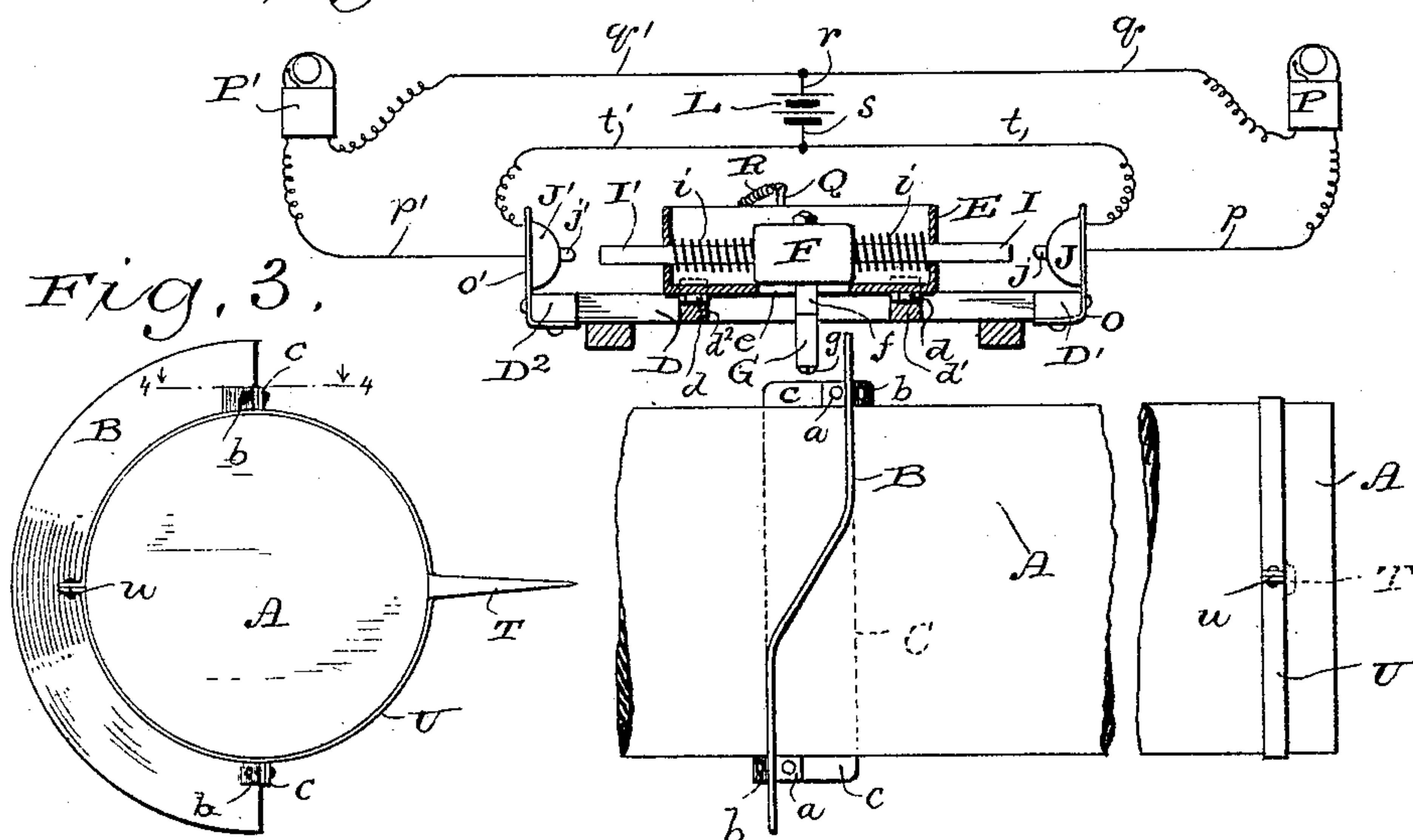
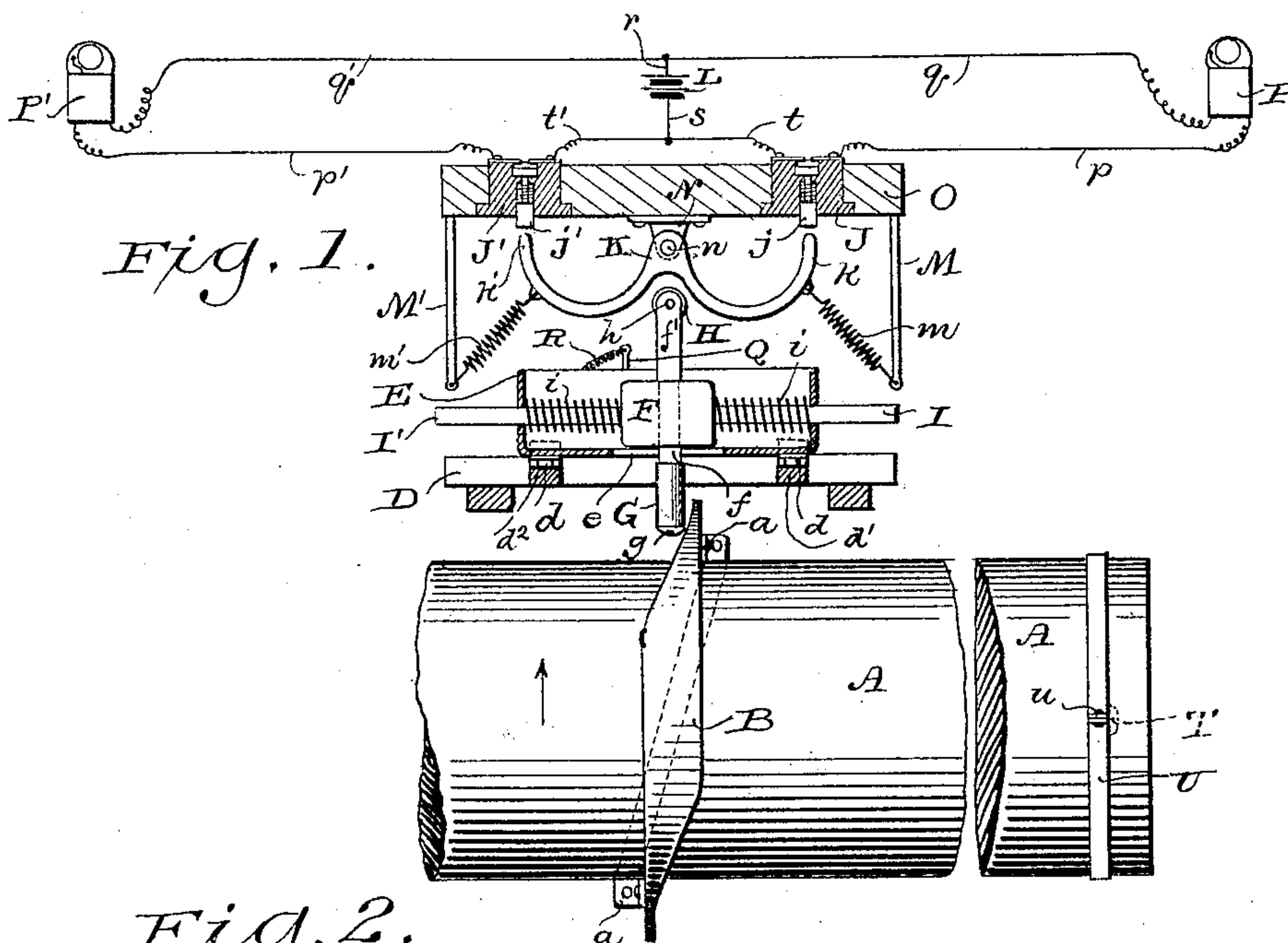


(No Model.)

J. C. RICKETSON.
ELECTRIC INDICATOR FOR ENGINE SHAFTS.

No. 404,867.

Patented June 11, 1889.



Witnesses
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UNITED STATES PATENT OFFICE.

JAMES C. RICKETSON, OF MILWAUKEE, WISCONSIN.

ELECTRIC INDICATOR FOR ENGINE-SHAFTS.

SPECIFICATION forming part of Letters Patent No. 404,867, dated June 11, 1889.

Application filed January 26, 1889. Serial No. 297,609. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. RICKETSON, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Electric Signals for Engine-Shafts; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to electric signals for engine-shafts, and will be fully described hereinafter.

In the drawings, Figure 1 is an elevation, partly in section, of one form of my present invention. Fig. 2 is a like view of another form of the same. Fig. 3 is an end view of the shaft and attachments shown in Fig. 2. Fig. 4 is a detail view illustrating one manner of securing the cam to its band or strap on the line 4 4 of Fig. 3.

My present invention has special reference to devices for indicating at any point distant from the shaft of a marine engine the direction in which said shaft is revolving, as well as its rate of speed, and is in part an improvement on the devices set forth in my prior application for patent, filed August 31, 1885, Serial No. 175,744, but is applicable to any reversible shafting.

A represents the shaft of a marine engine, which has secured to it a cam B, whose opposite side edges are alternatively operative, depending upon which direction the shaft is revolving. This cam is preferably secured to the shaft by a band or strap C, having suitable flanges or lugs *c*, bolted to the cam B, or to flanges or lugs *b* on said cam, or to an angle-plate *a*, interposed between the said flanges *b* and *c*, as best shown in Fig. 4, the particular method of attaching my cam B to the shaft A being non-essential so long as it is firmly secured thereto so as to revolve with it. The said cam B may be a double cam, as shown in Fig. 1, or a single bent strip, as shown in Fig. 2, so long as the outside or opposite side edges are shaped to be alternatively operative, as hereinafter described.

D represents the rear bar of a suitable supporting-frame, having cross-strips *d'* *d''*, on which the casing E of the slide F rests, said casing E being hinged to said cross-strips, as shown at *d*, and provided with a longitudinal

slot *e* in its bottom plate for the admission and travel of the lower part of the pin *f*, depending from the slide F, and which pin is surrounded by an anti-friction sleeve G (held in place by screw *g*) for engagement with the side edges of the described cam B. This pin *f*, in the form of my device shown in Fig. 1, extends entirely through the slide F and projects upward therefrom, (forming a contact-pin *f'*), terminating at its upper end in a bifurcation, between the arms of which an anti-friction roller H is journaled on a shaft *h*. From the ends of said slide F there project guide-pins I I', extending through perforations in the ends of the slide-casing E, between which ends and the ends of the said slide the said pins are surrounded by spiral springs *i i*. In Fig. 1 the said pins I I' are shown as guide-pins only, while in Fig. 2 these pins serve as contact-pins as well, and hence in the form of device shown in said Fig. 2 I dispense with the upward extension *f'* of the pin *f*, which serves as a contact-pin in the form shown in said Fig. 1, in the manner hereinafter described.

O, Fig. 1, represents a timber or frame-work supported above the slide-casing E and carrying push-buttons J J', having projecting push-rods *j j'*, respectively, and electrically connected to the distant signals P and P' and battery L by the wires *p, q, r, s*, and *t* and the wires *p', q', r, s*, and *t'*, respectively, as shown in the diagram portions of my drawings. From the timber O there depends a hanger N, to which is pivoted by journal *n* a double U-shaped lever K, one of whose outer free ends *k* is normally held (as by spring *m*, secured to rod M or other part of the frame-work) just beneath but out of contact with push-rod *j*, while the other outer free end *k'* of said lever K is likewise normally held (as by spring *m'*, secured to rod M' or other part of the frame-work) similarly just below but out of contact with push-rod *j'*. Hence it is obvious in this form of my device that a revolution of the shaft A in one direction (for instance, in the direction of the arrow shown on said shaft A in said Fig. 1) will cause one side of the cam B to impinge against the sleeve-covered end G of pin *f* and move said pin and its slide F to one side, so that the up-

per part f' of this pin, with its roller H, would strike against the lever K, and (in this described revolution) thereby raising the end k' of said lever against the push-rod j' of push-button J' , thereby closing the circuit $p' P' q' r L s t'$ and actuating the distant signal P' in such circuit, (the guide-pins I I' insuring that the slide F will move truly, so that the said roller H will strike against and raise the said arm of the lever K, as described,) and similarly if the shaft A revolves in the opposite direction, then the other side of the cam B will impinge against and move the pin f and its slide and roller H, and this will raise the other free end k of lever K against the push-rod j of push-button J and close the other circuit $p P q r L s t$, and thereby actuate the distant signal P in such other circuit. Thus the captain in the pilot-house (or wherever the said distant signals may be located) will at once know in which direction the shaft is revolving, (as well as its rate of speed by reason of the interval between the ringing of the bells or movement of the signals, whatever they may be, using bells by preference,) the bells, if such are employed as the signals P and P' , being preferably of different sound, for obvious reasons.

Inasmuch as it is only at certain times (as when entering or leaving port or making landings) that my device is needed, I have shown at $d d$ my slide-casing E hinged to its supporting-frame D $d' d^2$ and provided with a rod Q, to which may be attached a cord, spring, or wire R, for raising said slide-casing and dependent pin f out of the path of motion of the cam B, and I may, if desired, attach to this casing the spring-and-cord arrangement shown and claimed in connection with the slide-casing set forth in my application for patent for an analogous device filed October 4, 1888, Serial No. 287,162.

In the foregoing description relative to the form of my device illustrated in Fig. 1 I have set forth the means in which I make indirect communication between a contact-pin on my slide and the push-rods electrically connected to the distant signals—namely, by the interposition of a lever—and in Fig. 2 I have shown a means of direct communication, as follows: In this latter form of my device I dispense, as stated, with the lever K and contact-pin f' H, and secure the push-buttons J J' to vertical supports $o o'$, rising from cross-beams D' D² of the supporting-frame, so that the push-rods $j j'$ of said push-buttons shall be directly in the path of motion of the guide-pins I I' of the slide F, so that when the shaft revolves in either direction and the cam B impinges against and moves to one side the lower part G of the pin f the slide F will be moved therewith, and the guide-pin I or I' will thereby come in direct contact with the push-rod j or j' , and thereby close the circuit on that side and actuate the signal in said circuit in the manner already described.

In order that the engineer may be certain that the shaft when stopped is in such a position that the signals will not be actuated thereby, I may employ an indicator like the lug or rod T, secured to the shaft in any suitable manner, as by the band or strap U, which indicator is located at a point on the shaft on a horizontal line midway between the horizontal lines of the ends of the cam B, as best shown in Fig. 3, and then when this indicator T is in a vertical upward position it is evidence that the cam B is free from contact with the pin f . The said indicator may be attached in any manner to the band U and the ends of the latter flanged, as shown at u , and riveted together, thereby holding the strap firmly to the shaft.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an electric signal for engine-shafts, the combination of a revolving shaft and a two-sided or double cam attached thereto, with a pair of push-buttons electrically connected to distant signals, and a pin adapted to be moved by said cam to actuate said push-buttons, substantially as set forth.

2. In an electric signal for engine-shafts, the combination of a revolving shaft, a two-sided or double cam attached thereto, and a movable pin depending in the path of motion of said cam, with a pair of push-buttons electrically connected to distant signals and adapted to be actuated by said pin, substantially as set forth.

3. In an electric signal for engine-shafts, the combination of a revolving shaft, a two-sided or double cam attached thereto, a movable pin depending in the path of motion of said cam, and a slide connected to said pin, with a pair of push-buttons electrically connected to distant signals and adapted to be actuated by said pin, substantially as set forth.

4. In an electric signal for engine-shafts, the combination of a revolving shaft, a two-sided or double cam attached thereto, a movable pin depending in the path of motion of said cam, a slide connected to said pin, a contact pin or pins carried by said slide, and a pair of push-buttons electrically connected to distant signals and adapted to be actuated by said contact pin or pins, substantially as set forth.

5. The combination, with a revolving shaft, of a two-sided or double cam attached thereto, a pair of distant signals, push-buttons located adjacent to said shaft and connected by electric circuits to said distant signals, a horizontally-moving slide carrying a pin depending in the path of motion of said cam, and means, substantially as described, for closing one or the other of said electric circuits and actuating the signal in said circuit thereby closed, substantially as set forth.

6. In an electric signal for engine-shafts, the combination of a revolving shaft with a

cam partially encircling the same, and an indicator secured to said shaft at a point on a horizontal line between the horizontal lines of the ends of said cam, substantially as set
5 forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in

the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

JAMES C. RICKETSON.

Witnesses:

H. G. UNDERWOOD,
WILLIAM KLUG.