

B. W. ALLEN.  
ELECTRIC SWITCH.

No. 459,465.

Patented Sept. 15, 1891.

FIG. I

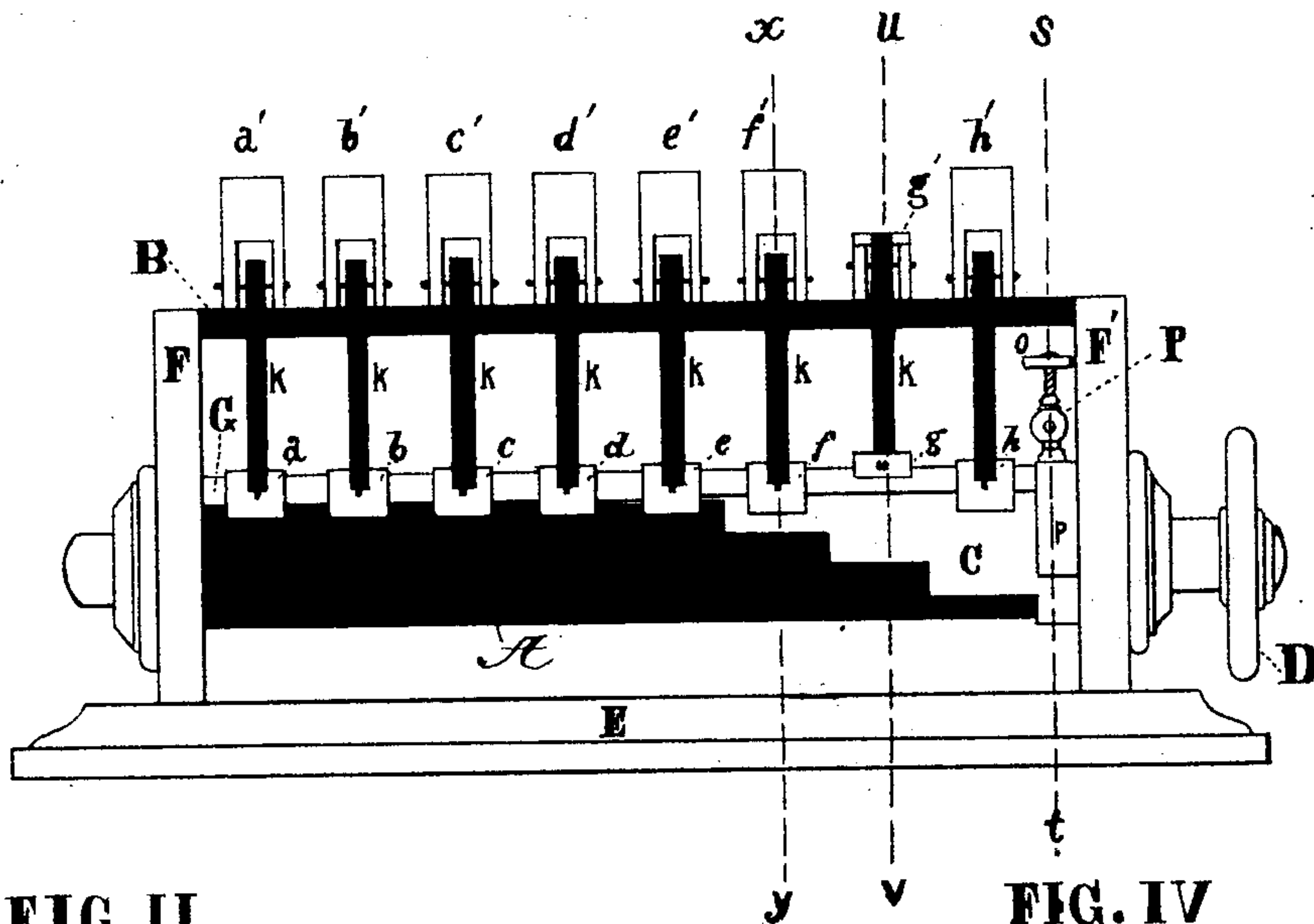


FIG. II

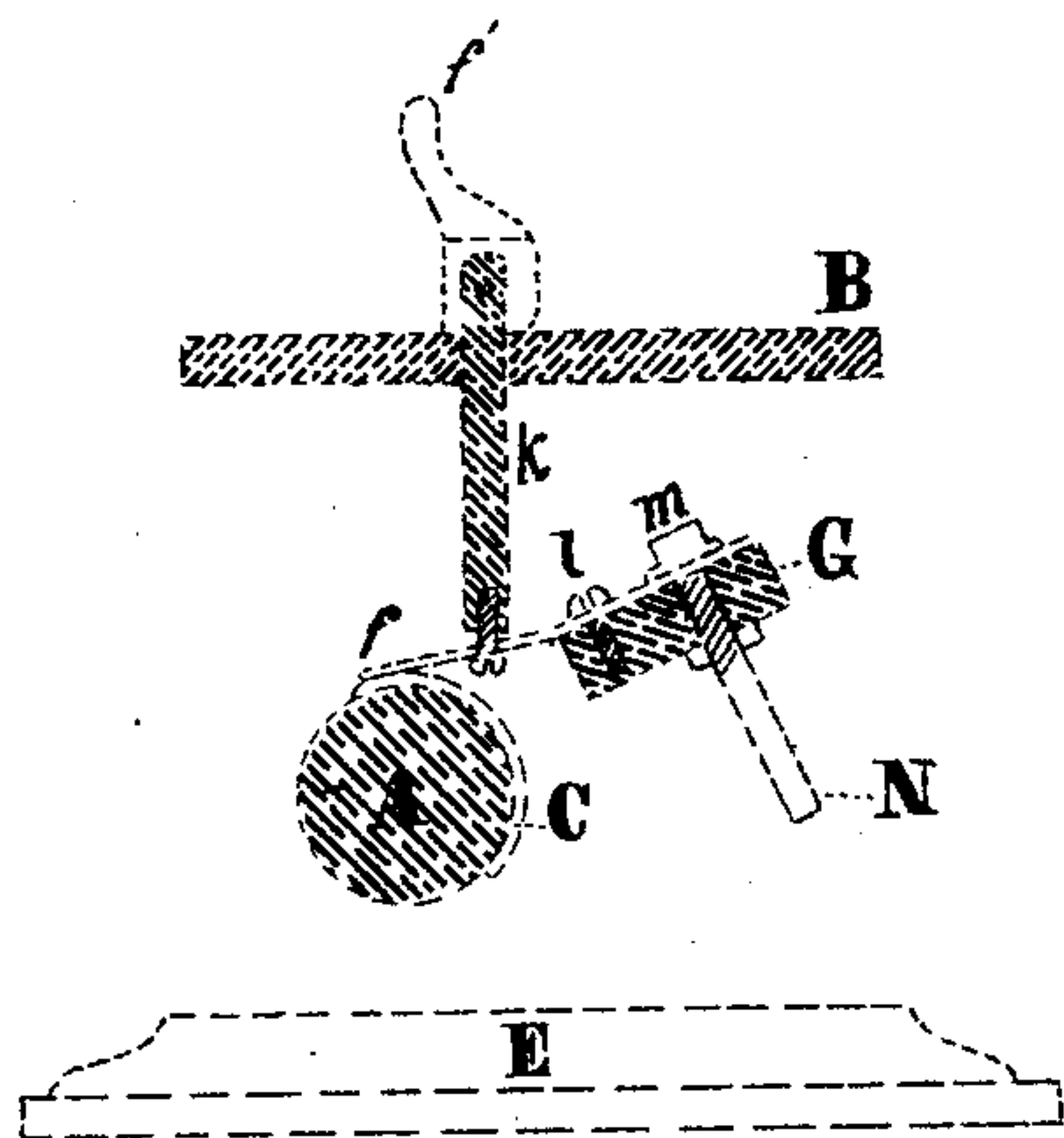


FIG. III

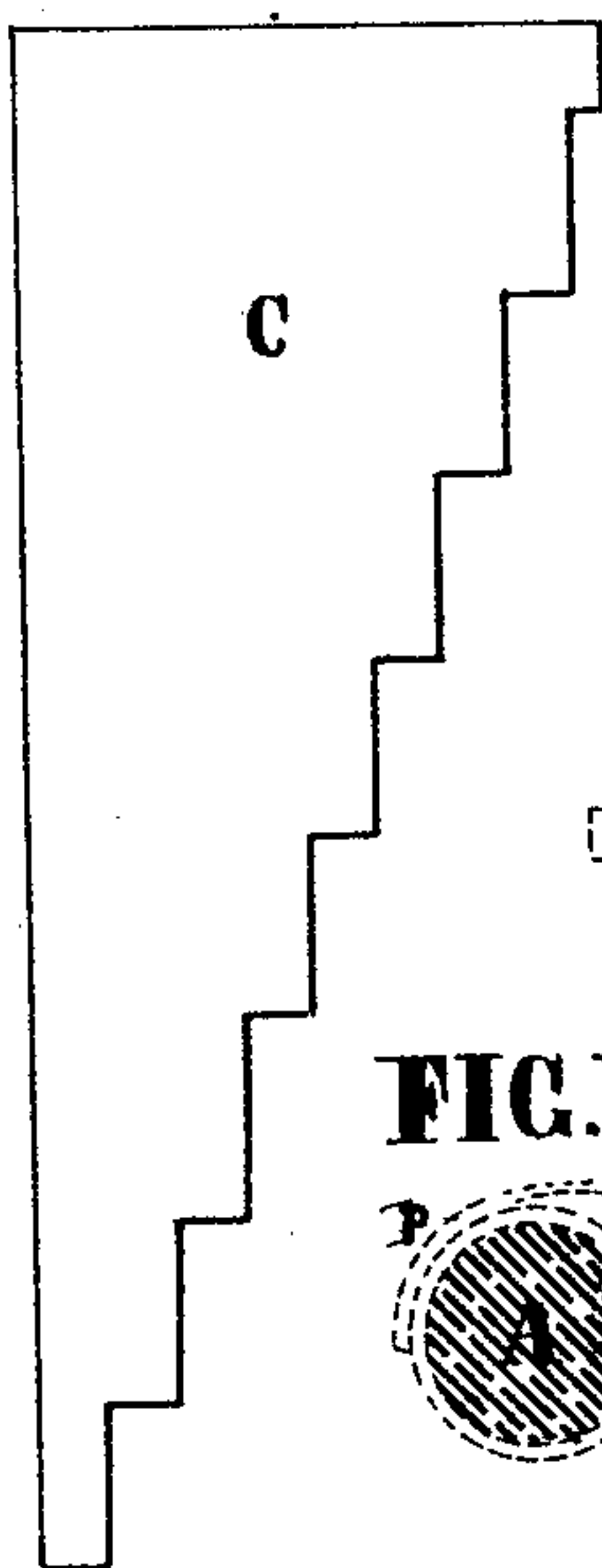


FIG. V

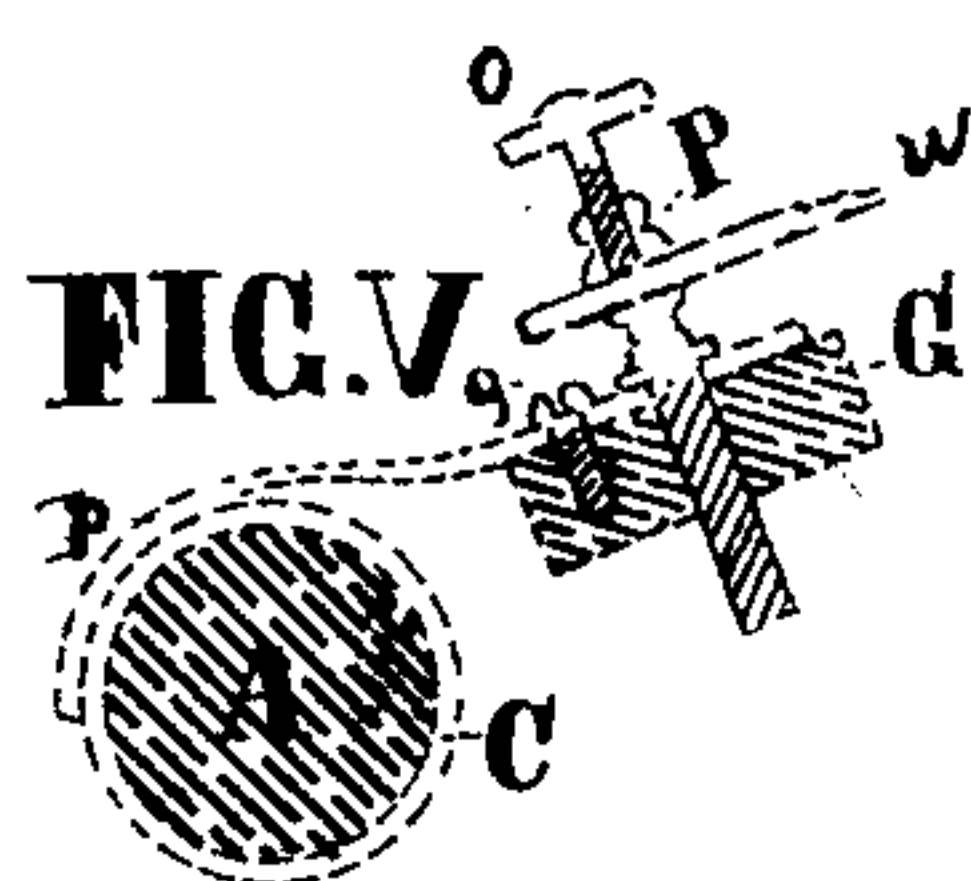


FIG. IV

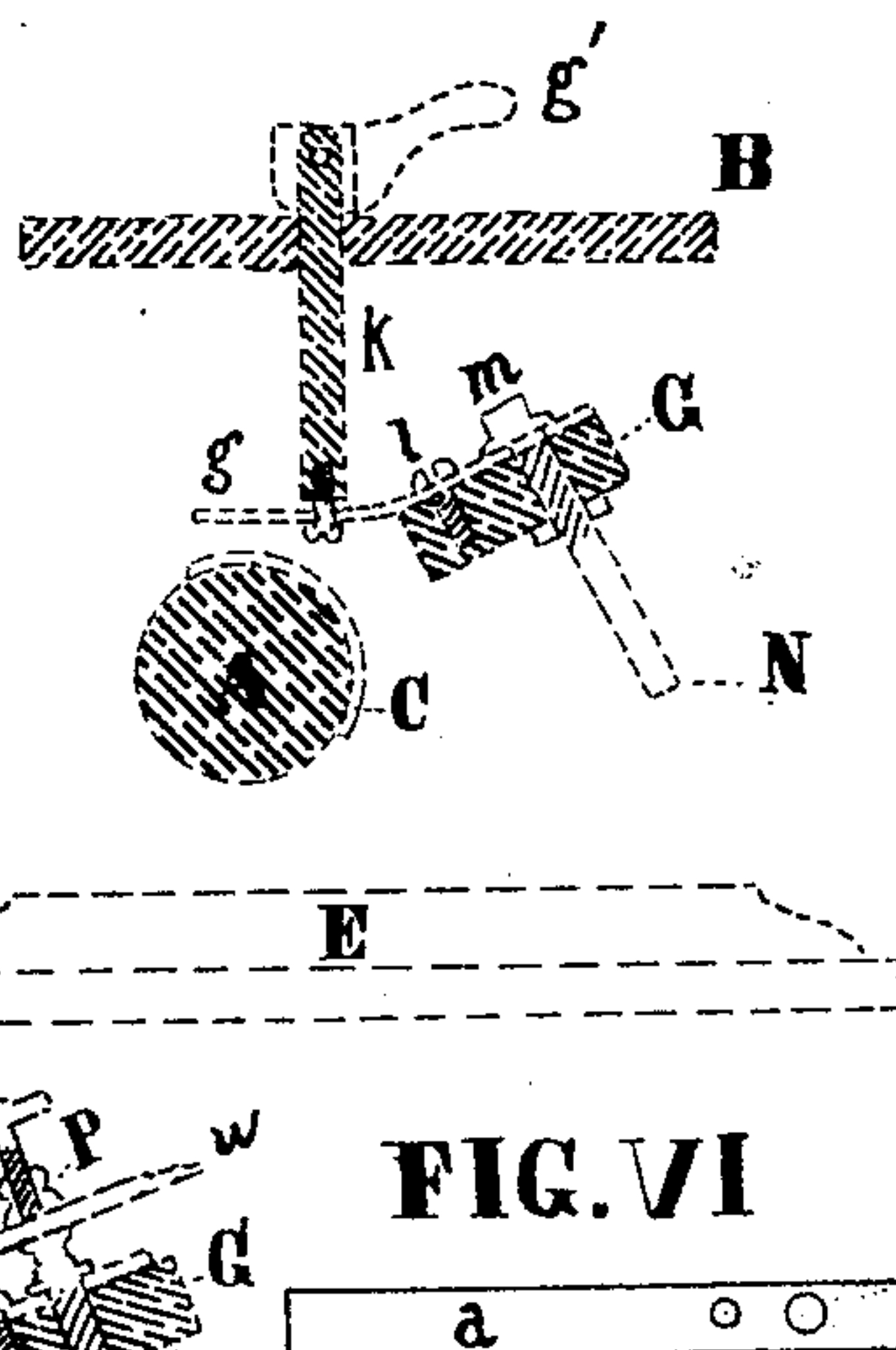
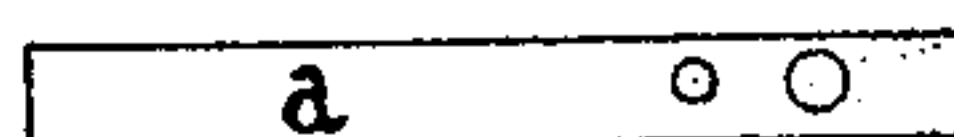


FIG. VI



WITNESSES

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FIG. VII

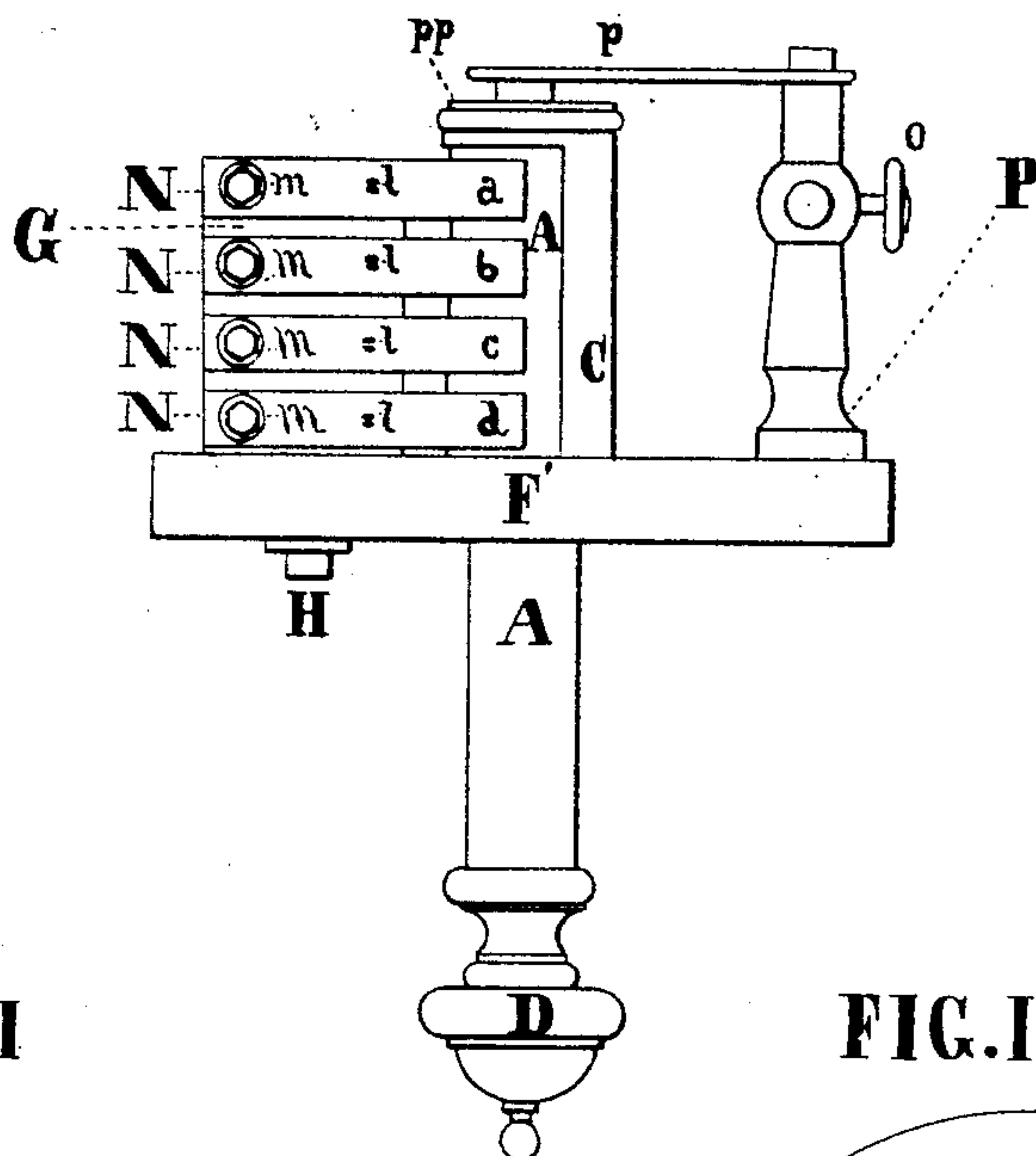


FIG. VIII

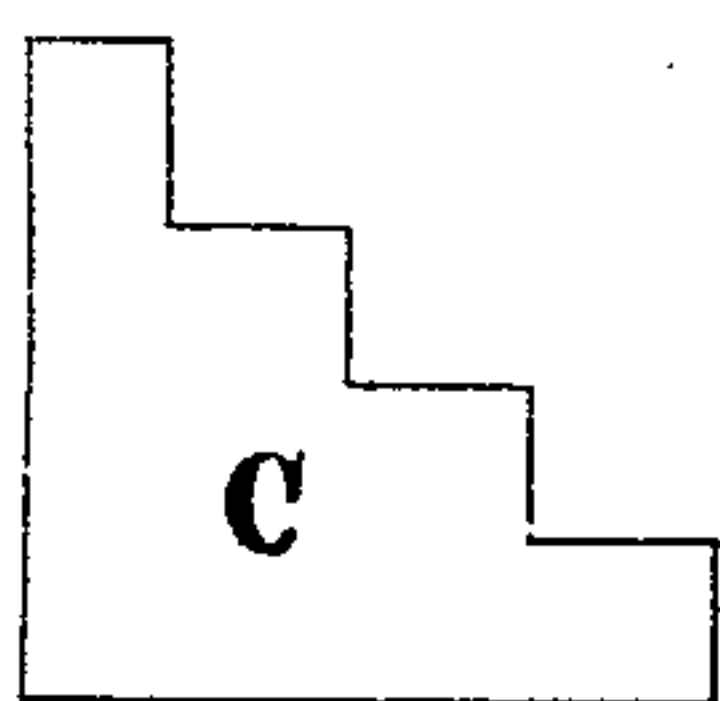


FIG. X

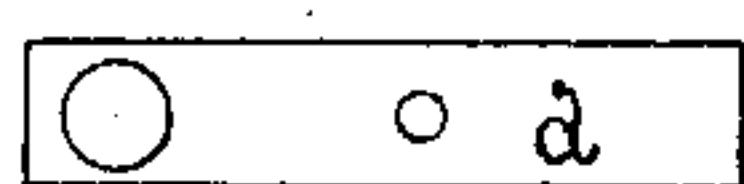


FIG. XI

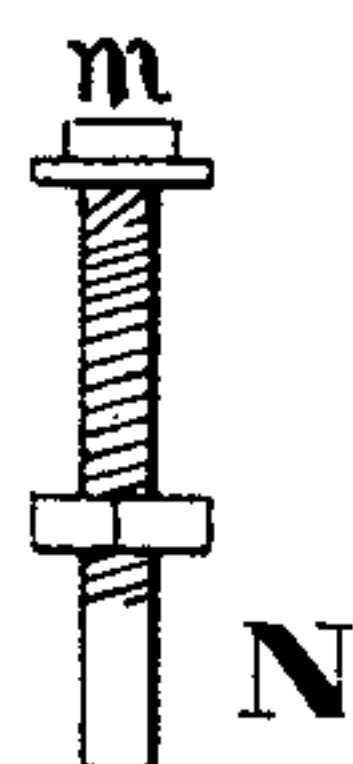
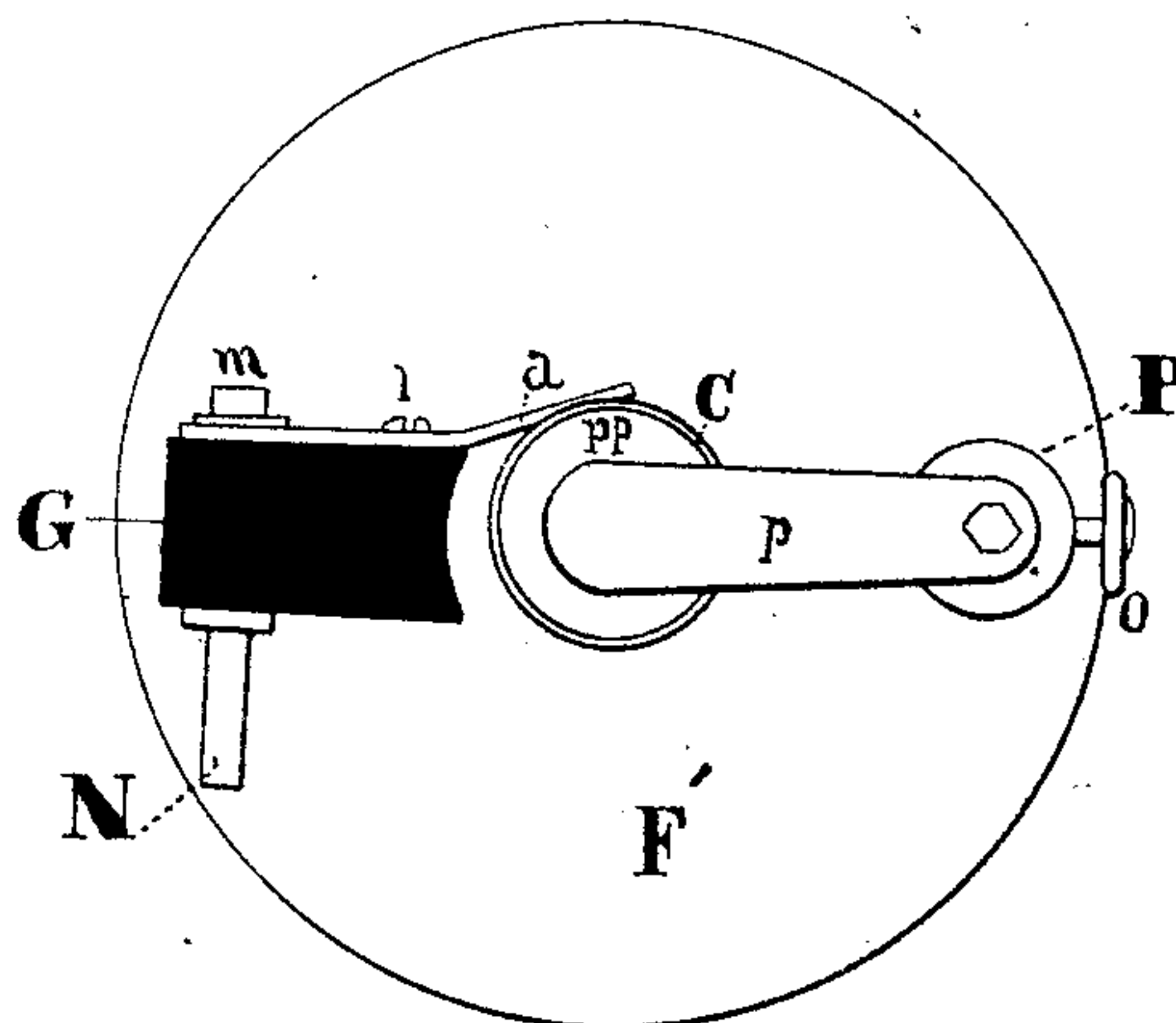


FIG. IX



WITNESSES

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# UNITED STATES PATENT OFFICE.

BOYD WM. ALLEN, OF BOSTON, MASSACHUSETTS.

## ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 459,465, dated September 15, 1891.

Application filed November 6, 1890. Serial No. 370,516. (No model.)

*To all whom it may concern:*

Be it known that I, BOYD WILLIAM ALLEN, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Electric Switches, whereby one or more electric lamps may be lighted or put out by one and the same switch without regard to their number or location; and I hereby declare the following to be a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

Heretofore it has been customary to employ a switch for each light or series of lights which it was desired to shut off or turn on at one time, thus making necessary a large number of switches—as, for instance, in a large building or hall—either placed on the walls, thus presenting an unsightly appearance, or on “switch-boards,” so called, sometimes costing great sums of money and at the same time presenting clumsy and undesirable complications, which both economy and safety require to be avoided, if possible.

The object of my invention is to secure both simplicity and economy in the manipulation of electric lamps, not singly, but in numbers or series. I attain this result by the mechanism illustrated by the accompanying drawings, in which similar letters represent similar parts throughout.

Figure I shows a side elevation of the switch made up of eight individual switches, which in practice may be greater or less in number, as may be desired, and each of which may serve a single lamp or a series of lamps, as may be desired. A is a cylinder or drum of hard rubber or other non-conducting material, upon which is wound or wrapped a plate or band of conducting metal cut in the serrate form of C. The serrated plate of conducting metal C is applied to the drum A lengthwise, and so enwraps it that the surface thereof is cylindrically continuous with and part of the remaining cylindrical surface of the drum A, the number of notches representing the number of individual switches desired. The letters *a b c d e f g h* represent the several individual switches represented in contact with the metal band C, except *g*, which represents the contact broken. B F

F' E represent the frame-work, within which is contained the different parts of my device. D represents a hand-wheel affixed to the drum A, whereby it may be conveniently revolved when journaled into the frame B F F' E.

Fig. II represents a perpendicular transverse section of Fig. I at *x y*.

Fig. IV represents a similar section of Fig. I at *u v*, and Fig. V a similar section at *s t*.

Fig. III represents the form of the plate or band C, made of some conducting metal and ready to be wound or wrapped about the drum A in Fig. I and lengthwise thereof in the manner before described, and Fig. VI represents an elastic metal tongue of some conducting material, ready to be used as one of the individual switches *a b c d*, &c., with two apertures therein, one for the screw *l* and the other for the screw *m*, as in Figs. II and IV.

G in Figs. I, II, IV, and V represents a beam of some non-conducting material extending lengthwise the frame-work B F F' E in Fig. I and so affixed to the end pieces F F' in manner as represented in Figs. II, IV, and V as to support the individual switches *a b c d*, &c. The pins of non-conducting material *k*, as shown in Figs. I, II, IV, and V, are fastened to the individual switches *a b c d*, &c., by a screw, as shown, or in any proper manner, so as to hold them firmly, and then pass through the horizontal beam B, and are then connected with levers or keys *a' b' c' d'*, &c., by pins and sockets in such manner that when the levers are upright, as in Fig. II, the individual switches *a b c d*, &c., are in contact with the metallic plate C on the drum A, resting thereon with elastic pressure, and when the levers are depressed, as in Fig. IV, the same switches are lifted from the metal plate C, and the electrical contact is broken. The beam G, as shown in Figs. I, II, IV, and V is of some non-conducting material, and supports not only the several individual switches before mentioned, but also a metallic screw *m* of some conducting material, as shown in Figs. II and IV, which in practice is firmly driven through the beam G, so as to form a complete electric contact with the switches *a b c d e f g h*. Upon the screw *m* is then affixed in any proper manner the negative electric wires supplying any given lamp or series of lamps. N represents the point where such



wires are to be affixed, and the same state of things exists with reference to each one of the said individual switches.

In Fig. V, which is a representation of the cross-section *s t* in Fig. I, as aforesaid, the metallic elastic tongue *p* is affixed to the beam of non-conducting material *G* by the screw *q*, and rests on the metallic plate *C* of the drum *A* with sufficient elastic pressure to make a complete electric contact. Through the plate *p* and the beam *G* is also passed a metallic screw or bolt *P*, which, with its shoulder, rests firmly on the plate *p*, as shown. Through the head of the bolt *P* in an aperture, as more clearly shown in Fig. I, is thrust the positive wire *w*, and upon it is screwed the hand-screw *o* in such manner as to bring the wire *w* into firm electrical contact with the bolt *P*, which itself is in electrical contact with the metallic plate *p*, and through it with the plate *C* on the drum *A*.

The operation of my device is as follows: The positive wire *w* is connected with any source of electricity desired, and thereby through the screw *P* and the metallic tongue *p* the metallic plate *C* on the drum *A* is charged. It is then in condition to make or break contact with any or all the several individual switches *a b c d*, &c., and this is done by causing the drum *A* to revolve in either direction, as may be desired, by turning the hand-wheel *D*, said wheel being attached to the said drum, as shown, and said drum being journaled into the frame *B F F' E*, as shown. It is not intended that the plate *C* shall wholly enwrap the drum *A*, so that sufficient non-conducting surface shall always be left thereon for each of the said individual switches. When, therefore, the drum *A* is turned in the manner aforesaid, so that the straight edge of the plate *C* shall have passed beyond all the said individual switches, every circuit will be broken. Then by turning said drum to the right, as shown in Fig. I, every circuit will be opened at once, and the electric current will be distributed to every point desired, whether it be a lamp or series of lamps or several lamps or series. If now it were desired to make successive connections, the drum *A* would be turned in the opposite direction, and then the switch *h* would first come into contact, then *g f*, and so on to switch *a*, which would be last. They then could be thrown out of circuit in the reverse order or all at once by continuing the left-hand revolution. If now it is desired to break any circuit while the others are on, it is accomplished by depressing a lever, as *g'* in Fig. IV or Fig. I, and thus any combination may be made, as desired.

Fig. VII shows the same device as that shown in Fig. I, but without the method of breaking the electric circuit by means of the pins of non-conducting material *k* and the levers or keys *a' b' c' d'*, &c., and is adapted especially to be used in connection with chandeliers or electroliers, the construction being

only so changed as to adapt it to the new use. The same letters represent similar parts, and corresponding to those shown in Fig. I. *F'* is a solid plate of hard rubber or some other non-conducting material, into which is firmly journaled the drum *A*. The upright *G* is firmly affixed thereto by the screw and nut *H*, and on said upright, constructed of some non-conducting material, is affixed the several individual switches *a b c d*, in the same manner as described in the description of Fig. I. The drum *A*, with the plate *C*, is prepared in precisely the same way as the same parts shown in Fig. I, with exception only that the number of notches in the plate is fewer. The metallic post or standard *P* is firmly affixed to the plate of non-conducting material *F'*, and upon the top of said post or standard *P* is firmly affixed the metallic tongue *p*, which rests with elastic pressure upon the metallic cap-piece *p p* of the drum *A*, which is constructed so as to be in electric contact with the metallic plate *C* as it enwraps the said drum. An aperture is constructed in the post *P* for the insertion of the positive wire, when the thumb-screw *o* is then screwed down upon it firmly, thus holding it in firm electrical contact with the post *P*. *D* is an ornamental knob serving the purpose of a hand-wheel for turning the drum *A* as desired.

Fig. VIII represents the plate *C* serrated and ready to be wound or wrapped around the drum *A* in Fig. VII, and, like the similar plate in Fig. III, is of some conducting metal.

Fig. IX is a horizontal elevation of Fig. VII and shows the situation of the parts of Fig. VII as observed from above.

Fig. X shows one of the individual switches *a b c d* ready to be put into position upon the upright *G*.

Fig. XI shows the nut-screw *m* with its negative pole *N* ready to be inserted through the upright *G* and the switch *a* and to be firmly tightened by setting up the nut thereon, as shown in Fig. IX.

The operation of this form of my device is as follows: The positive wire, which receives the electricity from the source of supply, is inserted through the aperture in the post or standard *P*, and the thumb-screw *o* is then set down upon it with sufficient firmness to secure perfect electric contact. The distributing or negative wires are affixed in any proper manner to the negative poles of the nut-screws *m* and carried to the several lamps in the electrolier in such combinations as desired. It is now ready for use. If it is desired to light all the lamps of the electrolier at once, the hand-knob *D* will be turned in the proper direction, thus bringing all the individual switches into electric contact with the metallic plate *C*, when the current passes through the said switches to the distributing-wires and the several lamps or series of lamps; or by turning the drum *A* in another direction first one lamp and then another lamp or series of lamps may be thrown into circuit and in any com-



5 combination desired. So, also, they may be thrown out of circuit in the reverse order by a reverse motion of the drum A, or all at once by a proper turn of the drum A by turning the knob D. In practice the whole device will be inclosed within the metal or other casing of the electrolier, and nothing but the knob D will be observable.

10 The plate C need not be simply serrate, as drawn, but the serrated portions may be separated, as the teeth of a comb, the teeth being successively shorter from one end of the plate to the other, or in such other order of length as may be desired, such teeth, however, always  
15 lying crosswise of the drum A and not lengthwise. This, however, relates only to convenience or economy in construction.

What I claim as my invention, and desire to secure by Letters Patent, is—

20 1. The combination, in an electric switch, of the drum of non-conducting material A, upon which and lengthwise thereof is wound or wrapped or otherwise properly applied the

serrated plate of conducting metal C, together with the several individual switches *a b c d* 25 *e f g h*, which shall complete the contact with the metal plate C on the drum A, the surface of the plate C being cylindrically continuous with the remaining surface of the drum A, so that its motion in either direction shall be un- 30 limited, all substantially as described.

2. The combination, in an electric switch, of the drum of non-conducting material A, upon which and lengthwise thereof is wound or wrapped or otherwise properly applied the 35 serrated plate of conducting metal C, together with the several individual switches *a b c d* *e f g h*, for completing the contact with said metal plate C, and the several pins or rods of non-conducting material *k*, moved by the le- 40 vers or keys *a' b' c' d' e' f' g' h'*, all substantially as described.

B. WM. ALLEN.

Witnesses:

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BOYD ALLEN.