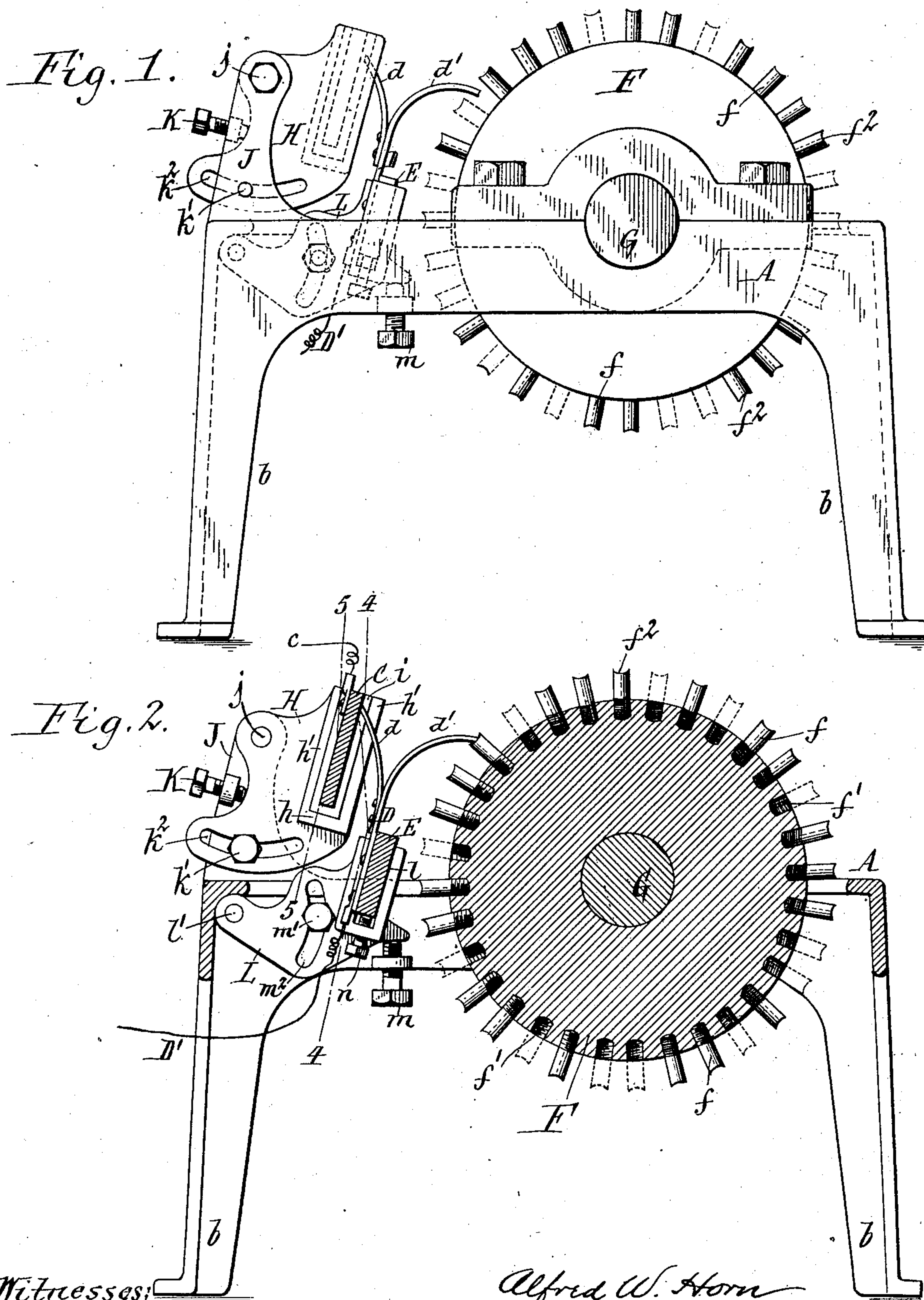


A. W. HORN.
ELECTRIC SWITCH.

APPLICATION FILED APR. 7, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:
Louis W. Gratz
Emma M. Graham

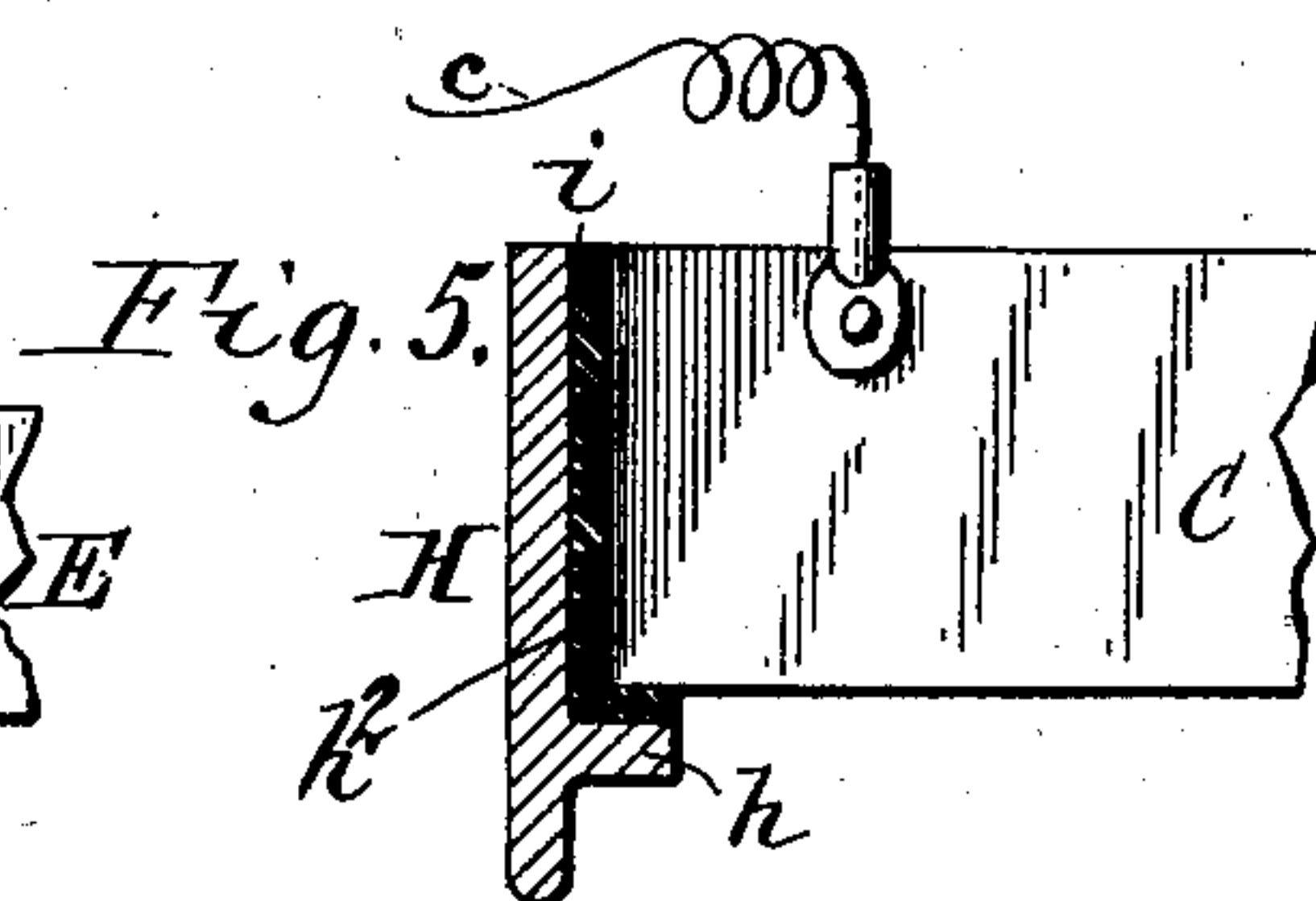
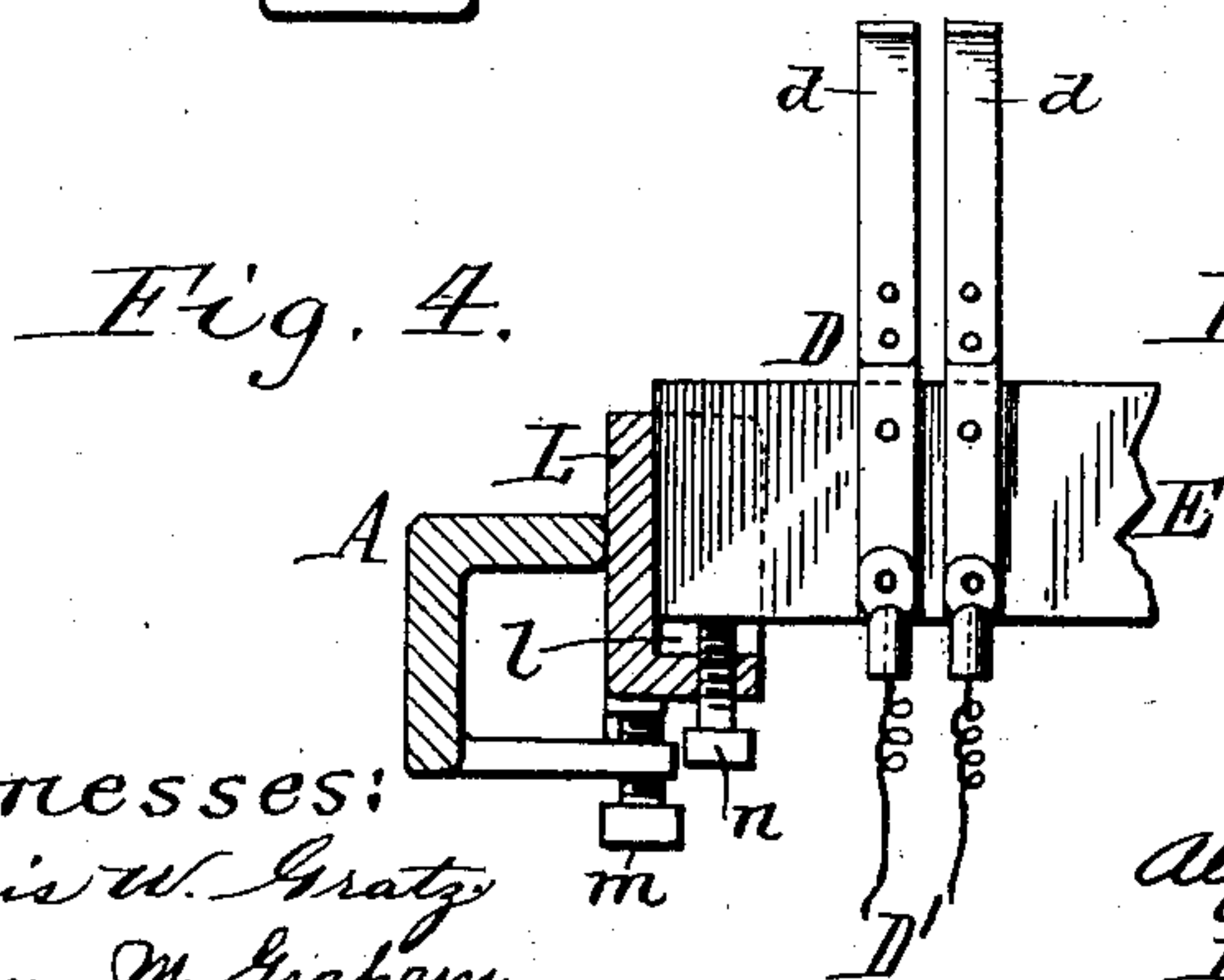
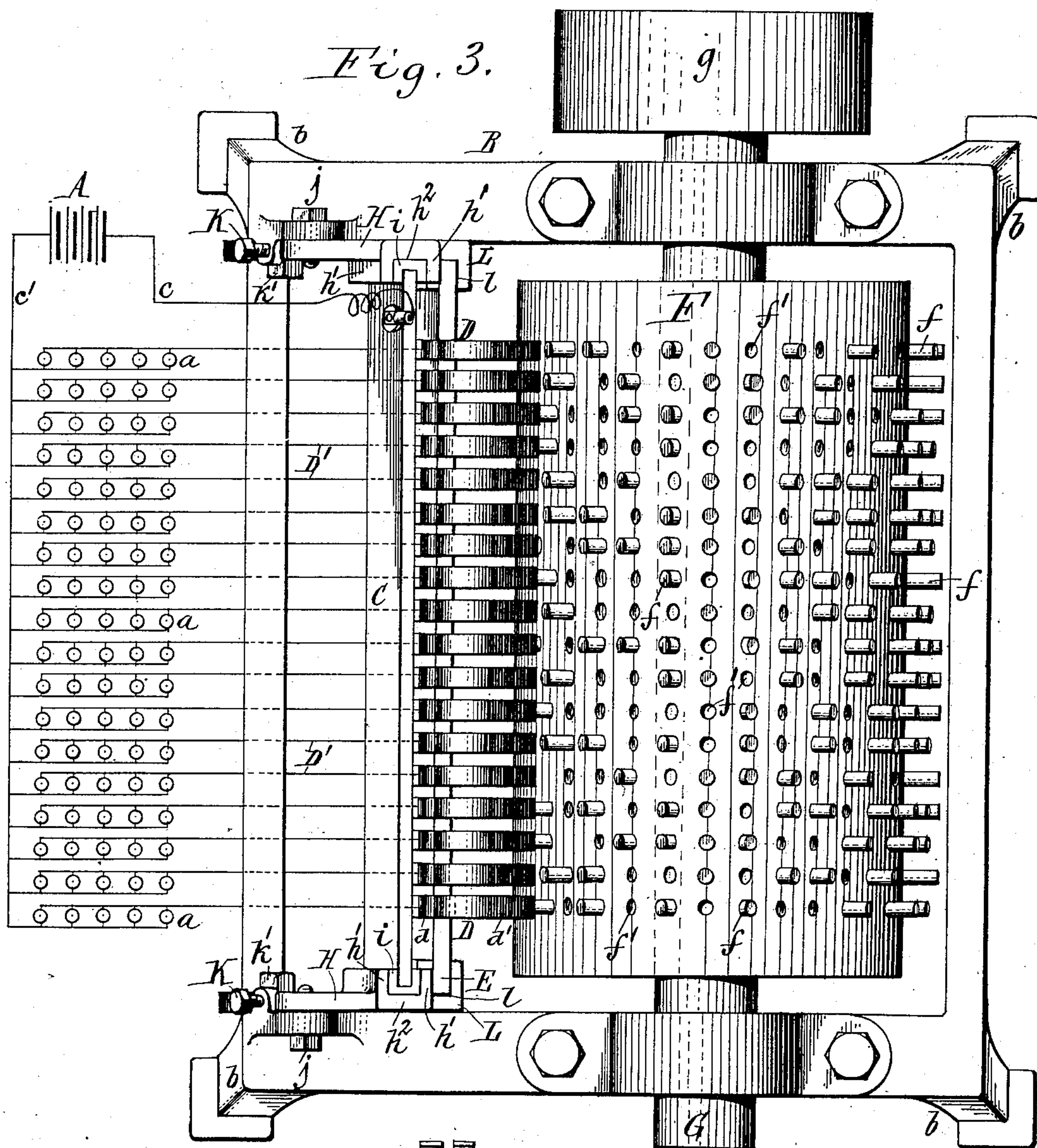
Alfred W. Horn
Inventor
By Geyer & Popp
Attorneys.

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UNITED STATES PATENT OFFICE.

ALFRED W. HORN, OF BUFFALO, NEW YORK, ASSIGNOR OF ONE-HALF TO
ALBERT HORN, OF BUFFALO, NEW YORK.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 721,194, dated February 24, 1903.

Application filed April 7, 1902. Serial No. 101,636. (No model.)

To all whom it may concern:

Be it known that I, ALFRED W. HORN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Electric Switches, of which the following is a specification.

This invention relates to an electric switch designed more particularly for electrical advertising-signs in which letters, figures, &c., are produced by illuminated incandescent electric lamps.

It is the object of this invention to provide a simple and effective switch for this purpose which can be readily set for producing different letters, &c., and which can be easily adjusted for taking up wear and producing perfect electrical contact.

In the accompanying drawings, consisting of two sheets, Figure 1 is an end elevation of my improved electrical switch. Fig. 2 is a vertical cross-section thereof. Fig. 3 is a top plan view thereof. Figs. 4 and 5 are fragmentary vertical sections in lines 4-4 and 5-5, Fig. 2, respectively.

Like letters of reference refer to like parts in the several figures.

a represents a number of incandescent electric lamps, which are arranged in groups, so that different illuminated letters, figures, or characters may be produced by placing the required groups of lamps in circuit with an electric generator *A*.

The movable parts of the switch which control the different lamp-circuits are mounted on an open frame *B*, having supporting-legs *b*.

C represents a main or universal contact-plate arranged lengthwise above the frame on one side thereof and connected with one pole of the generator by a wire *c*. The opposite pole of the generator is connected by a wire *c'* with one side of the several groups of lamps.

D represents a plurality of vertical contact-arms, which are arranged in a longitudinal series or row adjacent to the inner side of the contact-plate and each of which is connected by a wire *D'* with the opposite side of one of the groups of lamps *a*. The lower end of each contact-arm is mounted on a longitudinal bar *E*, of wood, fiber, or other insulating material, and its upper end is provided with a contact-

finger *d* and a shifting-finger *d'*. These fingers diverge upwardly from the bar and transversely of the same. The contact-arms and their fingers are preferably made of flexible or resilient metal, such as spring-brass. The outer finger *d* of each contact-arm faces the contact-plate, and in its normal position is disengaged from the same, as shown by dotted lines in Fig. 1, so that the electric circuit of which this arm is a part is broken and the corresponding group of lamps is extinguished.

F represents a carrier having, preferably, the form of a horizontal drum or barrel, which is arranged lengthwise adjacent to the inner side of the contact-arms and turns so that the side next to the contact-arms moves upwardly. This drum is provided on its periphery with shifting pins or teeth *f*, which are adapted to engage with the inner fingers of the contact-arms and shift the same outwardly, so that the outer fingers thereof engage with the contact-plate and close the electric circuit through the same. The drum is provided on its periphery with a plurality of sockets *f'*, which receive the shifting-pins and which are arranged so that they form a number of parallel rows lengthwise of the same and also a plurality of circumferential rows, each of the latter being transversely in line with one of the contact-arms *D*. Upon rotating the drum the pins in each annular row successively engage and clear the inner finger *d'* of the corresponding contact-arm, whereby the respective contact-arm and its fingers are alternately deflected outwardly and strained, as shown in Fig. 1, and then retracted by their resilience to their inward normal position, as shown in Fig. 2. While the shifting-pin is moving the contact-arm outwardly, its outer finger *d* engages the contact-plate, thereby closing the circuit through the respective group of lamps, and when the contact-arm moves inwardly after the pin clears the same its outer finger is disengaged from the contact-plate, thereby breaking the circuit through said lamps. The throw of each shifting-pin is preferably more than enough to bring the outer finger into contact with the plate, which causes both fingers to be straightened out after the outer finger engages the plate, thereby straining the fingers and producing a rubbing or scraping contact

between the outer finger and plate, insuring a perfect electrical connection between the same. By constructing the contact-arm and its fingers of flexible material and diverging the fingers from the arm a variation in the length of the shifting-pins is permissible without interfering with the working of the switch. All of the pins in the same longitudinal row shift their coöperating contact-arms simultaneously, so that the corresponding groups of lamps are lighted and extinguished in unison. By removably attaching the shifting-pins to the drum the same can be disposed in the required order on the drum for lighting any group or combination of groups of lamps for producing the desired letters, figures, characters, &c.

In order to prevent the ends of the inner fingers of the contact-arms from slipping too freely from the ends of the shifting-pins, each of the pins is provided in its end with a cavity or recess f^2 , which receives the end of the finger, thereby insuring the required duration of contact between the outer finger and the contact-plate.

The pin-drum is mounted on a shaft G, which is journaled in the frame and may be rotated continuously by a belt applied to a pulley g on one end of the shaft or by any other well-known means. Instead of rotating the drum continuously the same may be rotated intermittently by any suitable mechanism which is constructed to allow the drum to rest while its pins are holding the contact-arms in their operative position.

The contact-plate C is supported by two rock-arms H H, each of which is provided with a socket or seat, in which one end of the contact-plate is removably seated. Each of these sockets opens inwardly and upwardly and has a bottom h , which supports the contact-plate on its lower edge, two flanges $h' h'$, which extend upwardly from the bottom and bear against opposite sides of the plate, and a back h^2 , which bears against the outer edge of the plate. When seated in these sockets, the contact-plate is securely held in place against downward, lateral, and lengthwise movement. Each of the sockets is provided with a lining i , of mica, fiber, or similar material, whereby the contact-plate is insulated from the supporting-arm.

Adjacent to each supporting-arm H the frame is provided with a standard J, to which the arm is pivoted at its outer end by a horizontal pin or screw j , so that the same can turn transversely for raising or lowering the plate and tilting the same more or less.

K represents adjusting-screws mounted on the standards J and bearing against the outer edge of the supporting-arms. Upon turning the screws forward the supporting-arms are moved so as to raise the contact-plate, while upon turning these screws backward the arms and the plate descend. After being adjusted the arms are held in position by clamping-screws k' , arranged on the standards and

passing through segmental slots k^2 in the arms.

When one side of the contact-plate becomes coated with soot or smoke, due to sparking between the same and the outer contact-fingers, the plate can be reversed in the sockets of its supporting-arms, so as to cause the inner contact-fingers to bear against the opposite side of the plate. By this means the side of the plate which is not in use is accessible, and the same can be conveniently cleaned while the machine is in operation ready to be substituted for the side which is in use when the same becomes coated with soot, thereby maintaining the contact-surfaces in working condition and insuring perfect illumination of the lamps.

The insulating-bar E of the contact-arms D is adjustably supported by two rock-arms L L, arranged at opposite ends of the frame and each provided at its inner end with an upright guideway l , which receives the adjacent end of the insulating-bar. At its outer end each supporting rock-arm L is pivoted to the frame by a pin l' , which is parallel with the pivot of the contact-plate. Each supporting-arm L can be raised or lowered by a screw m , arranged on the frame and bearing against the lower side of the arm. After adjustment the latter is held in position by a clamping-screw m' on the frame passing through a segmental slot m^2 in the arm. In addition to raising and lowering the insulating-bar, together with its supporting-arms, in the arc of a circle this bar is capable of a rectilinear adjustment in the guideways of the supporting-arms by adjusting-screws n , arranged in the lower end of the guideways and bearing against the lower edge of the insulating-bar. These adjusting devices permit of accurately adjusting the relation of the contact-plate, the fingers of the contact-arms, and the shifting-fingers of the drum for producing electrical contact at the proper time. The wear upon the parts may also be readily taken up and the place on the plate C where the same is engaged by the contact-fingers may be shifted for bringing different parts of its surface into use.

I claim as my invention—

1. In an electric switch the combination of a plurality of movable contacts, a carrier movable past said contacts and provided with a plurality of longitudinal rows of seats, each row having a seat in line with each contact, and pins for shifting said contacts removably secured to said seats, substantially as set forth.

2. In an electric switch, the combination of a row of movable contacts, a rotary drum arranged lengthwise of the row of contacts and provided with a plurality of rows of seats or sockets, each row having a socket in line with each contact, and pins for shifting the contacts removably secured in said sockets, substantially as set forth.

3. In an electric switch, the combination of

a contact-plate, a plurality of contact-arms each provided with a contact-finger and a shifting-finger, and a carrier provided with pins adapted to engage with the shifting-fingers of said arms for moving the contact-fingers into engagement with said contact-plate, substantially as set forth.

4. In an electric switch, the combination of a contact-plate, a plurality of contact-arms each provided with diverging contact and shifting fingers, and a rotary drum provided with a plurality of pins each of which is adapted to engage with the shifting-finger of one of said arms and move the corresponding contact-finger into engagement with said plate, substantially as set forth.

5. In an electric switch, the combination of a contact-plate, a support upon which said plate is reversibly mounted, a plurality of contacts arranged adjacent to said plate, and a carrier provided with a plurality of pins for shifting said contacts into engagement with said plate, substantially as set forth.

6. In an electric switch, the combination of a contact-plate, supports provided with sockets lined with insulating material in which said plate is seated, an insulating-bar arranged adjacent to said plate, a plurality of contacts mounted on said bar, and a carrier provided with a plurality of pins for shifting said contacts into engagement with said plate, substantially as set forth.

7. In an electric switch, the combination of a contact-plate, an insulating-bar provided with a plurality of contacts, a guideway in which said insulating-bar is arranged, an adjusting device for shifting said bar in said guideway, and a carrier provided with pins

for moving said contacts into engagement with said plate, substantially as set forth. 40

8. In an electric switch, the combination of a contact-plate, an adjustable support carrying said plate, an insulating-bar provided with contacts, an adjustable support carrying said bar, and a carrier provided with pins for shifting said contacts into engagement with said plate, substantially as set forth. 45

9. In an electric switch, the combination of a contact-plate, adjustable rock-arms supporting said plate, an insulating-bar provided with a plurality of contacts, adjustable rock-arms carrying said bar, and a carrier provided with pins for moving said contacts into engagement with said plate, substantially as set forth. 50

10. In an electric switch, the combination of a contact-plate, rock-arms provided with insulated sockets which receive said plate, adjusting-screws for shifting the rock-arms of said plate, an insulating-bar, rock-arms provided with guideways which receive said bar, adjusting-screws for shifting said bar in the guideways, adjusting-screws for shifting the rock-arms supporting the insulating-bar, a plurality of contact-arms mounted on the insulating-bar and each provided with diverging contact and shifting fingers, and a drum provided with pins for engaging with said shifting-fingers and moving the contact-fingers into engagement with the contact-plate, substantially as set forth. 55 60 65 70

Witness my hand this 1st day of April, 1902.

ALFRED W. HORN.

Witnesses:

THEO. L. POPP,
CARL F. GEYER.