

No. 751,830.

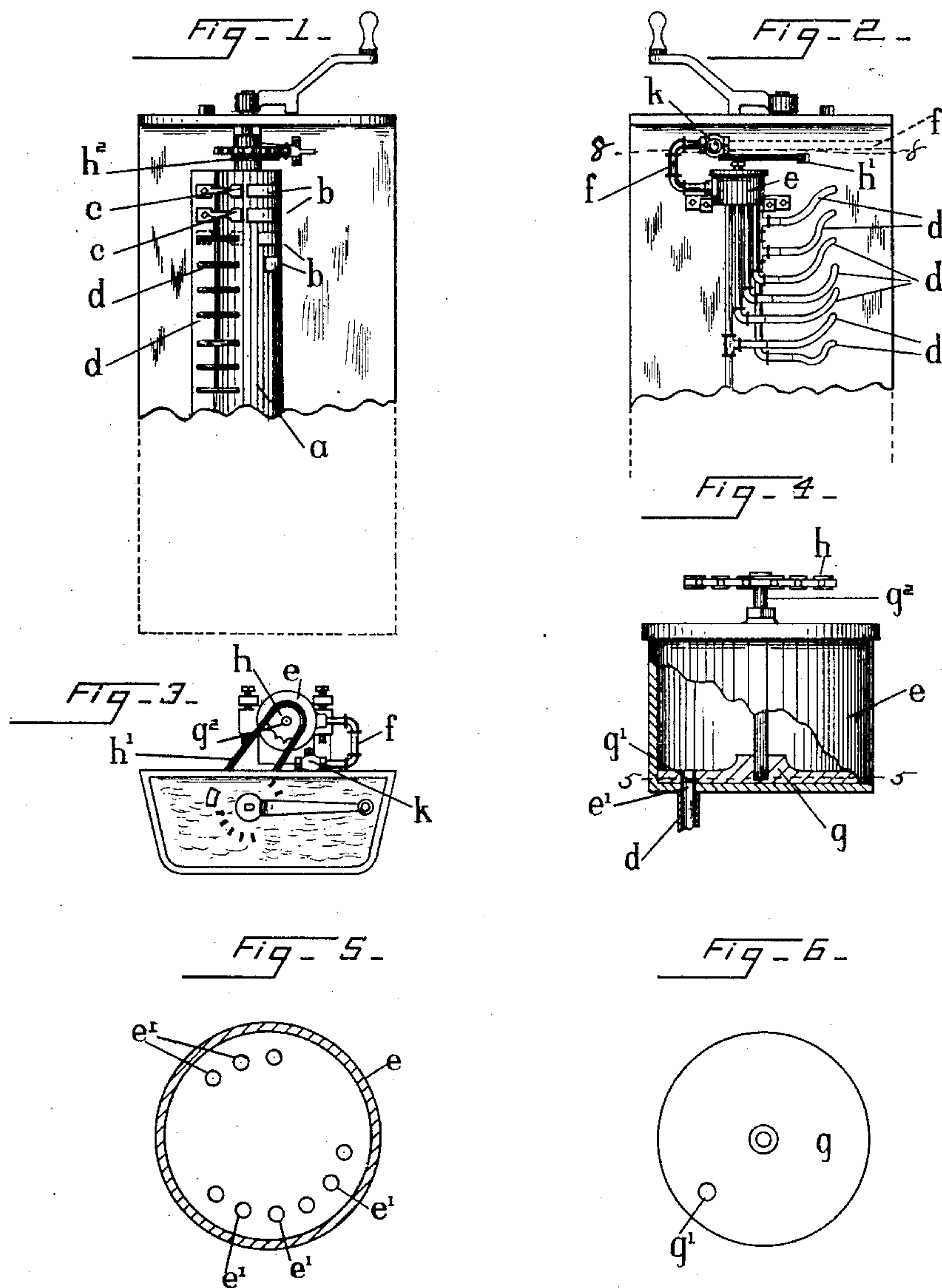
PATENTED FEB. 9, 1904.

C. E. BLOOD.
ARC PREVENTER.

APPLICATION FILED OCT. 14, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses
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May F. Ritchie.

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NO MODEL.

2 SHEETS—SHEET 2.

Fig - 7 -

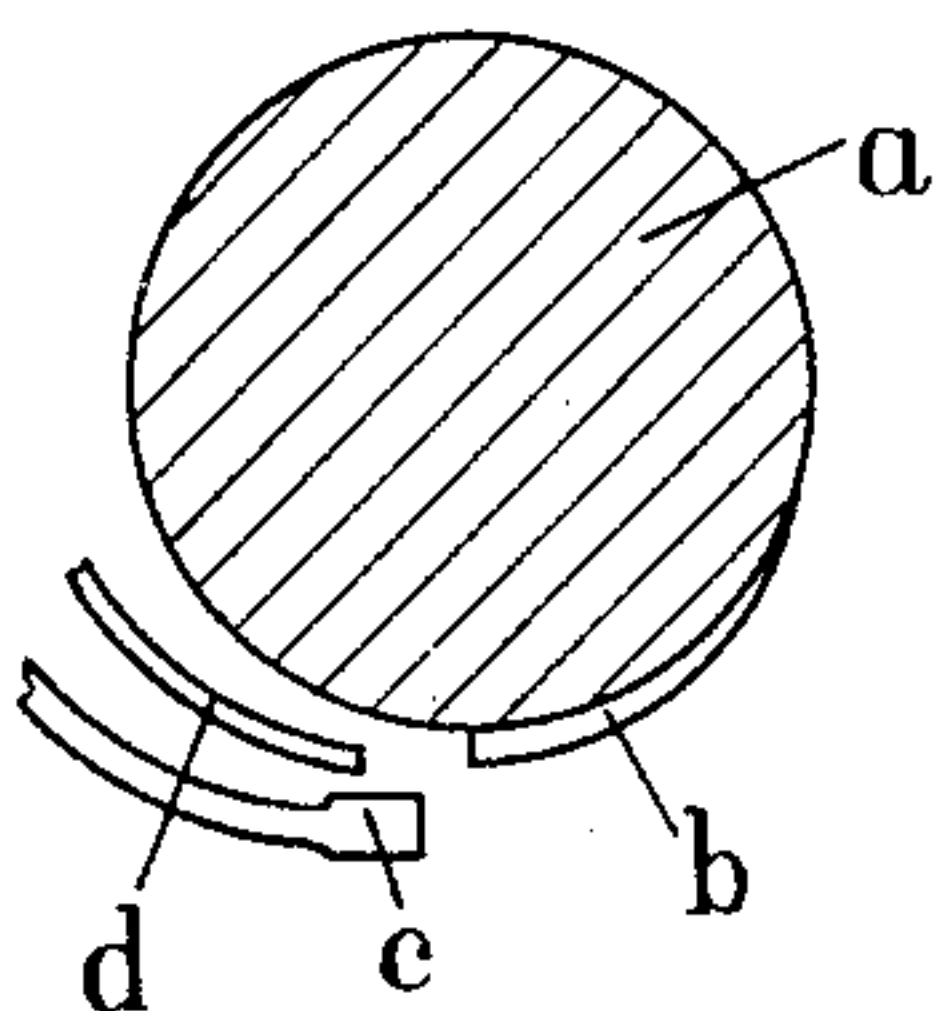


Fig - 8 -

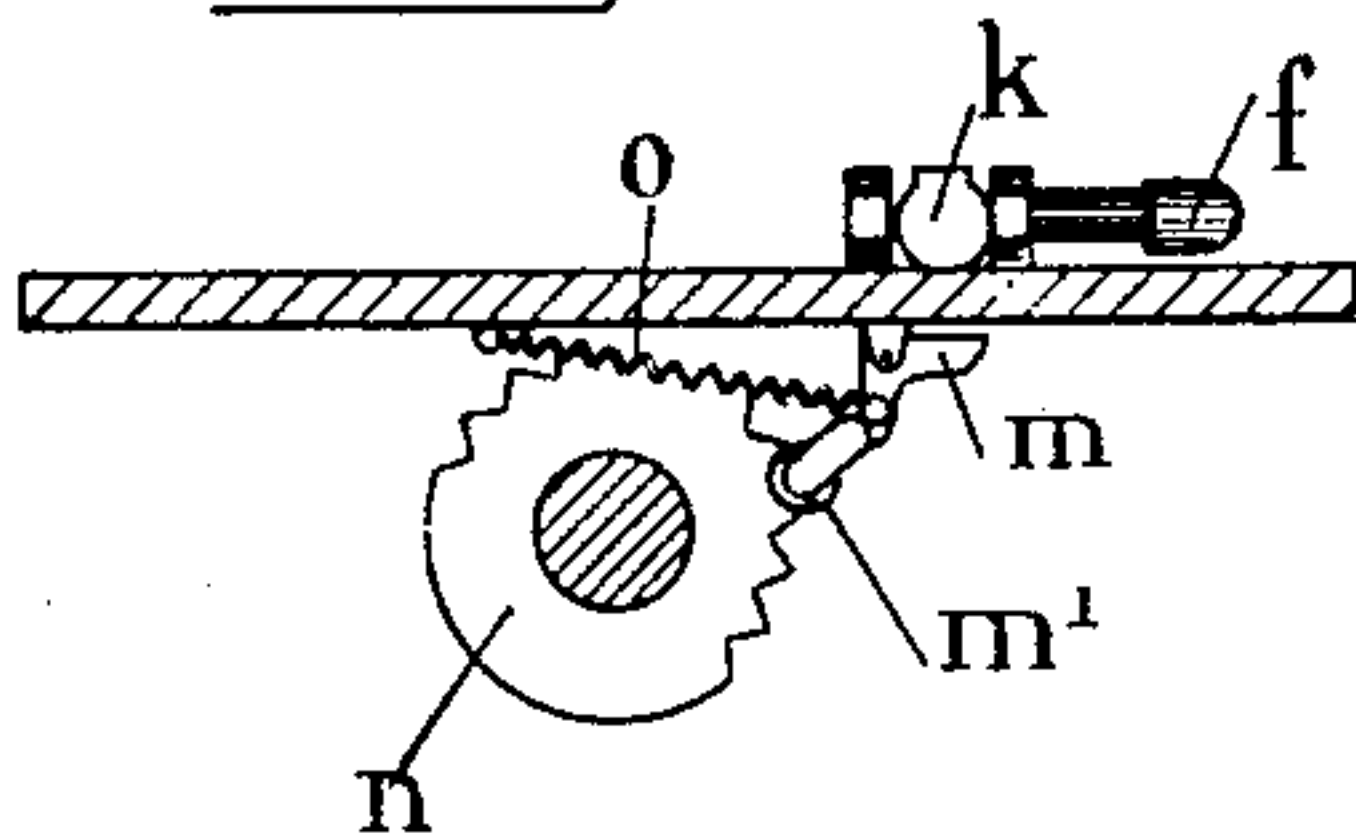
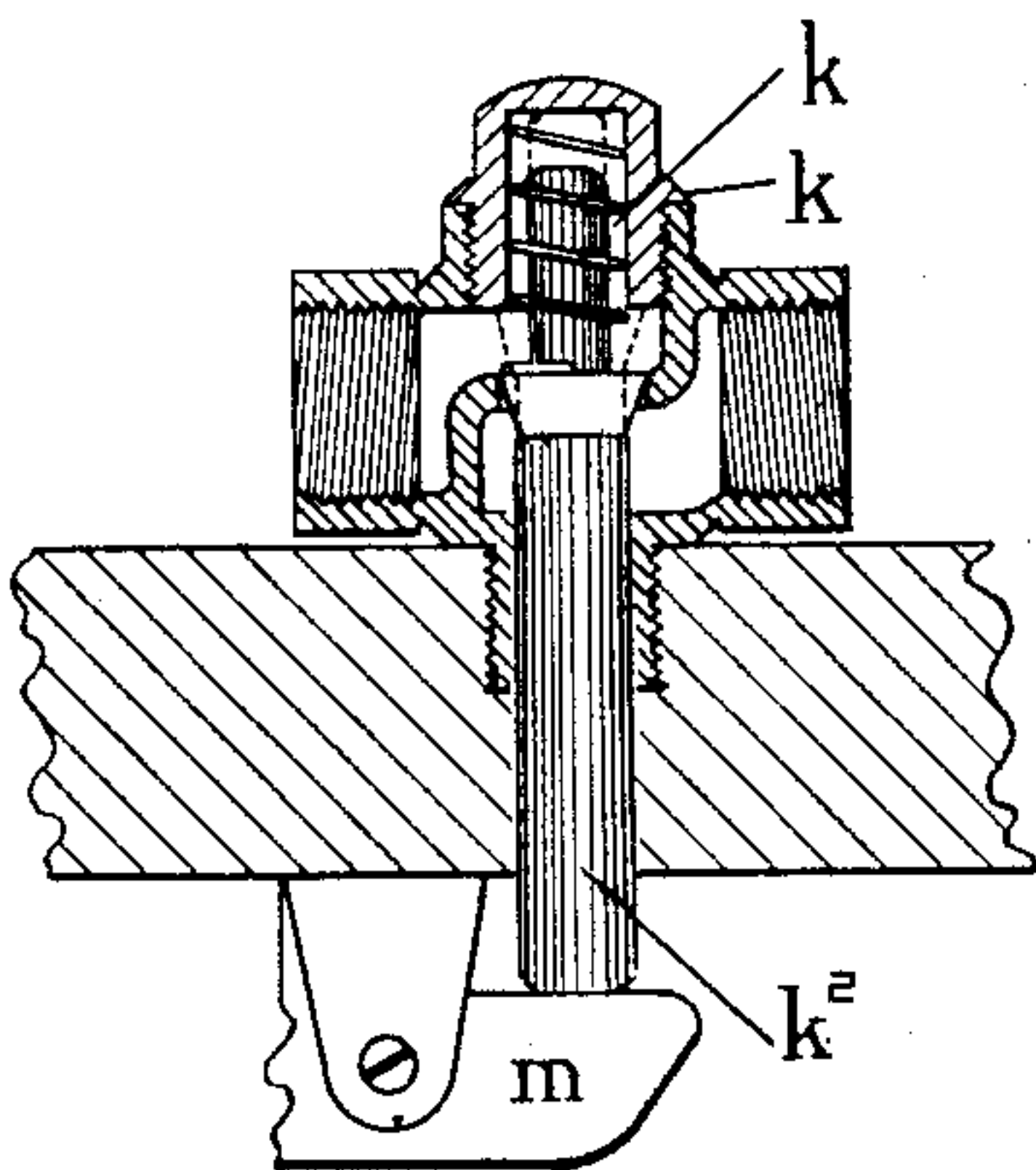


Fig - 9 -



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UNITED STATES PATENT OFFICE.

CHARLES E. BLOOD, OF FITCHBURG, MASSACHUSETTS.

ARC-PREVENTER.

SPECIFICATION forming part of Letters Patent No. 751,830, dated February 9, 1904.

Application filed October 14, 1903. Serial No. 177,038. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. BLOOD, a citizen of the United States, residing at Fitchburg, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Arc-Preventers, of which the following is a specification.

The chief object of my present invention is to provide simple and effective means for preventing so-called "arcing" in electrical apparatus, and thus prevent both the burning out of expensive appliances and the delays incident to such "burning out."

My invention may be utilized with various classes of electrical appliances, in fact, with all apparatus in which there is a tendency to "arc" or, in other words, in which the electric current is inclined to jump or bridge over an interrupted circuit. In explaining my said invention I have illustrated it as applied to a controller of the form commonly used in electric cars.

Briefly described, my invention consists of a current of compressed air or other gas that is passed between the adjacent ends of an interrupted electric circuit, and I find by experiment and practical demonstration that such interposed current of compressed gas or air serves to deflect and effectually interrupt the said electric current, and thus prevents arcing.

The accompanying drawings illustrate a portion of a controller embodying my said invention, Figures 1 and 2 being elevations of the same from the front and rear sides, respectively, and showing one means which I may employ for controlling and properly directing the said interposed current of air. Fig. 3 is a plan of the same, and Fig. 4 is an enlarged side view of the air-controlling cylinder and piston, the same being shown partly in vertical section to expose the interior construction of the said cylinder. Fig. 5 is a cross-sectional view of the said cylinder, taken on line 5 5 of Fig. 4. Fig. 6 is a plan view of the piston *g*. In Fig. 7 I have shown somewhat enlarged a cross-section of the vertical shaft *a* and have also shown in proper relation thereto one of the contact-fingers *c* and one of the pipes by means of which a current of compressed air is directed between

the adjacent contact-points. In Fig. 8 I have shown enlarged a transverse sectional view on line 8 8 of Fig. 2, illustrating particularly the means provided for admitting and cutting off the supply of air to the cylinder *e*; and in Fig. 9 I have shown considerably enlarged the cut-off valve *h*.

The controller which I have here utilized for the purpose of explaining the application and operation of my arc-preventer is of the ordinary type. It forms no part of my present invention and therefore need not be described in detail. It consists, essentially, of the rotating cylinder *a*, bearing a multiple of contact fingers or brushes *b*, and of fixed contact fingers *c* that lie in the circular path of the said fingers *b*. When the cylinder *a* is rotated to move the contacts *b* into or out of engagement with the fingers *c*, there is an occasional tendency on the part of the electric current to jump from one of said fingers to the companion finger just as the said fingers are about to break contact or contact with each other, thus producing an arc capable of burning out and destroying such parts of the apparatus as lie within the influence of said arc. To prevent this expensive and annoying result, I have provided pipes *d* immediately behind the fixed fingers *c*, as here shown, the free ends of said pipes being so located that a current of air passed therethrough will be directed across the free ends of the fingers *c*—that is to say, between the fingers *b* *c* when the said fingers are nearly in contact—the said current of air (or the like gas) serving effectually to prevent the described tendency to arc. The pipes *d* may be connected with any suitable supply of compressed air—as, for example, the reservoir of compressed air now commonly used for setting the brakes—and in order to use said air most economically I preferably provide automatic cut-off and controlling devices, which I will proceed to describe.

Mounted adjacent to the cylinder *a* is a fixed cylinder *e*, whose lower end wall is provided with openings *e'*, which form outlets that connect with the described pipes *d*. *f* indicates an air-pipe that connects the cylinder *e* with the source of supply—that is to say, with a compressed-air reservoir. Within the cyl-

inder *e* is a piston or disk *g*, that is adapted to rotate within said cylinder, said disk being provided with an opening *g'*, that may be made to register with either of the described outlets *e'*, and it will now be understood that by suitably rotating the disk *g* within the cylinder *e* a current of air may be discharged through either of the pipes *d*.

On the exposed end portion of the axial support *g*² of the disk *g* is a sprocket-wheel *h*, that is connected by a chain *h'* with a similar sprocket-wheel *h*², carried by the cylinder *a*, and it will therefore be obvious that when the cylinder *a* of the electric controller is rotated the disk *g* will simultaneously move its opening *g'* into register with the pipe *d*, through which it is desired to force a current of air.

In order to further control and economize the use of compressed air, I preferably place in the air-supply pipe *f* a cut-off valve *k*, having, as here shown, a valve that is held normally shut by a spring *k'*. The exposed valve-stem *k*² is engaged by one arm of a lever *m*, whose other arm bears a roll *m'*, that coöperates with a notched disk *n*, carried by the controller-cylinder *a*, the roll *m'* being held in engagement with said notched disk by a spring *o*, as is best seen in Fig. 8 of the drawings.

The several parts just described are so arranged and so adjusted that when the cylinder *a* is rotated to move the fingers *b* into contact with the fingers *c* the notches on disk *n* force the roll *m'* and the connected lever-arm *m* outward, and thus open the valve *k* and turn on the supply of compressed air just as the said fingers engage or break contact to close or open the circuit. At that instant and until the circuit is again interrupted by the separation of the contact-fingers the current of air is not needed. It will thus be seen that I provide for a current of compressed air between the contact-fingers until they engage or break con-

tact with each other and then shut off said current of air until such time as it is again needed.

I wish it particularly understood that while I have described my invention as applied to the current-controllers of electric cars the said invention may be applied to any other electrical circuit to prevent arcing.

Having thus described my invention, I claim—

1. In combination with the rotary cylinder and the fixed and movable contacts, pipes having their outlet ends in line with and between the fixed and movable contacts, and means actuated and controlled by said cylinder for automatically controlling the current of air through said pipes.

2. The combination with the rotary cylinder and the fixed and movable contacts, of pipes in line with and disposed between the fixed and movable contacts, an air-supply pipe for said pipes, a cut-off valve in said supply-pipe, a spring normally holding said cut-off closed, a lever, a roller carried by said lever and a notched disk carried by said cylinder for coöperation with said roller.

3. The combination with the rotary cylinder and the fixed and movable contacts, of pipes for delivering compressed air between the fixed and movable contacts, an air-supply pipe for said pipes, a cut-off valve in said pipe, a lever, a roller carried by the other arm of said lever, a spring normally holding the valve closed, a notched disk carried by the cylinder for coöperation with said roller, and a spring holding said roller in engagement with the disk.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES E. BLOOD.

Witnesses:

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MAY F. RITCHIE.