

K. VON KANDÓ.

## SWITCH FOR MULTIPHASE ALTERNATING CURRENT MOTORS.

(No Model.)

(Application filed Dec. 31, 1900.)

2 Sheets—Sheet 1.

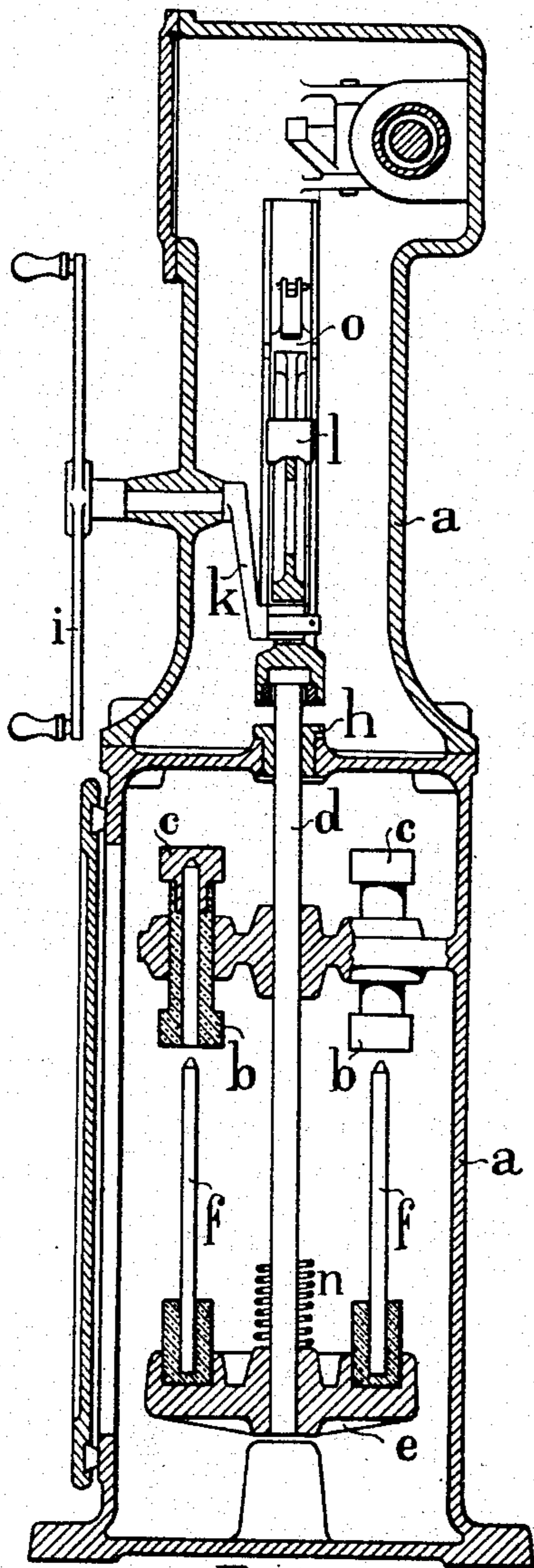


Fig. 1.

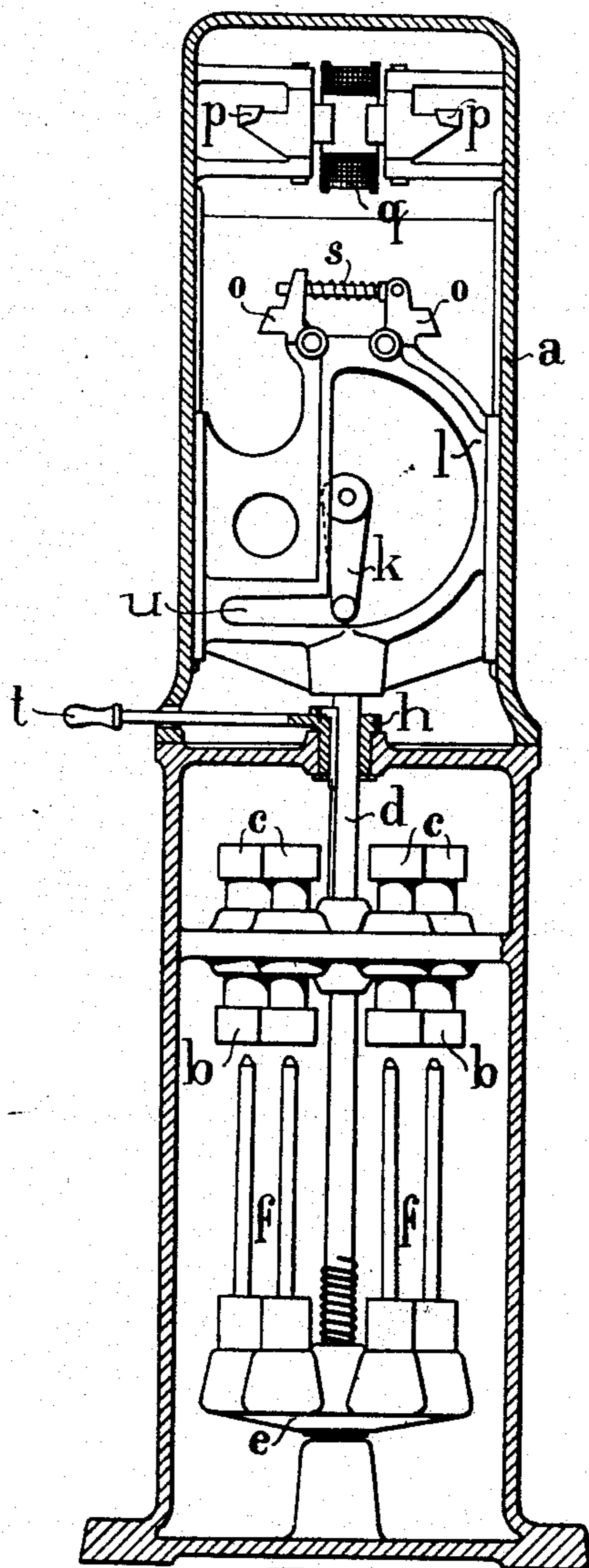


Fig. 3.

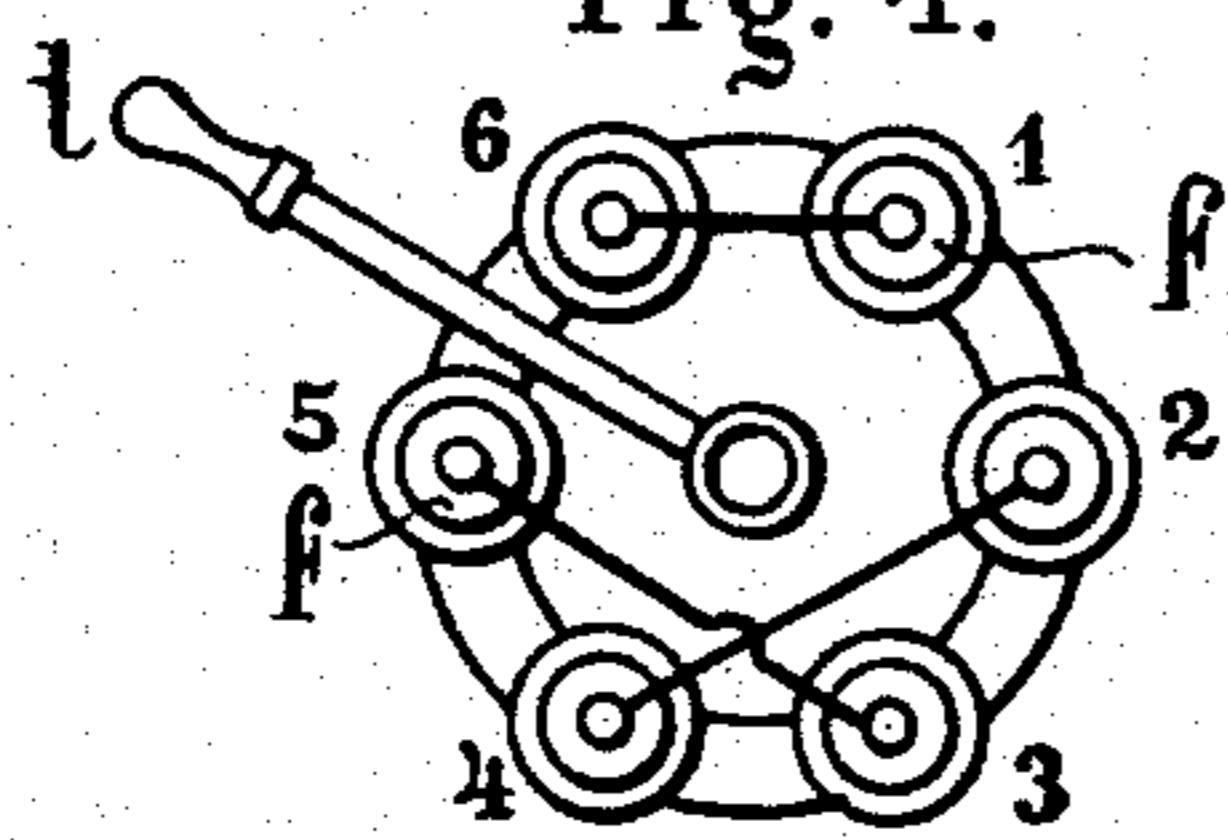
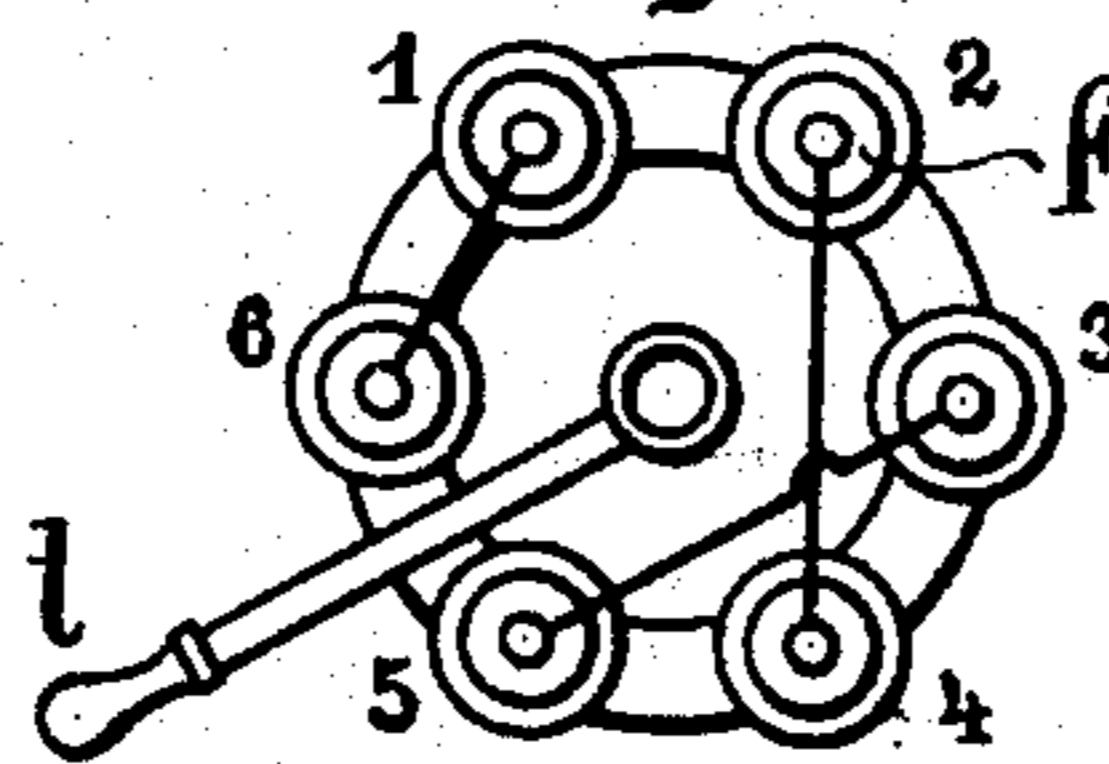


Fig. 2.



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2 Sheets—Sheet 2.

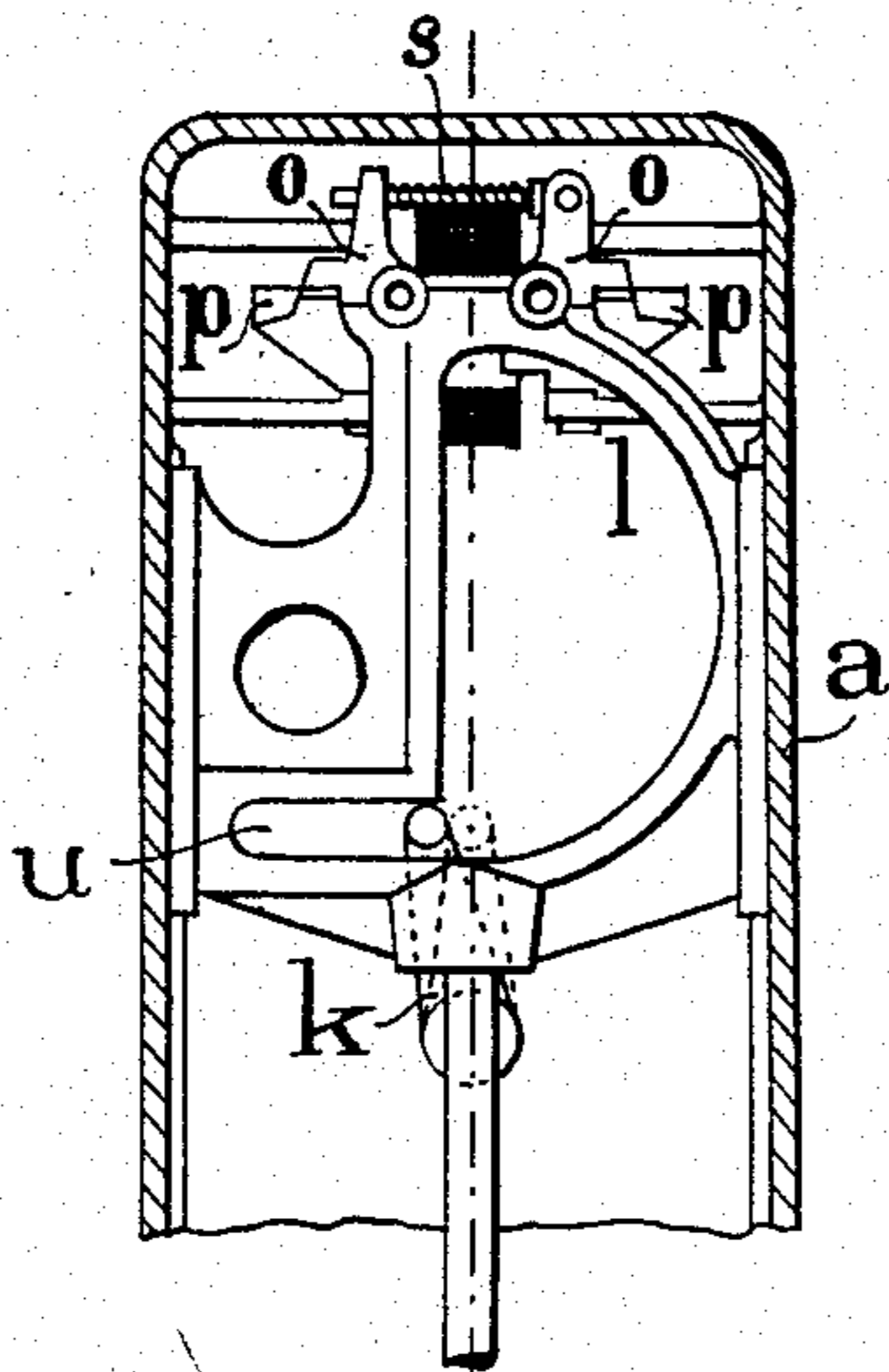


Fig. 6.

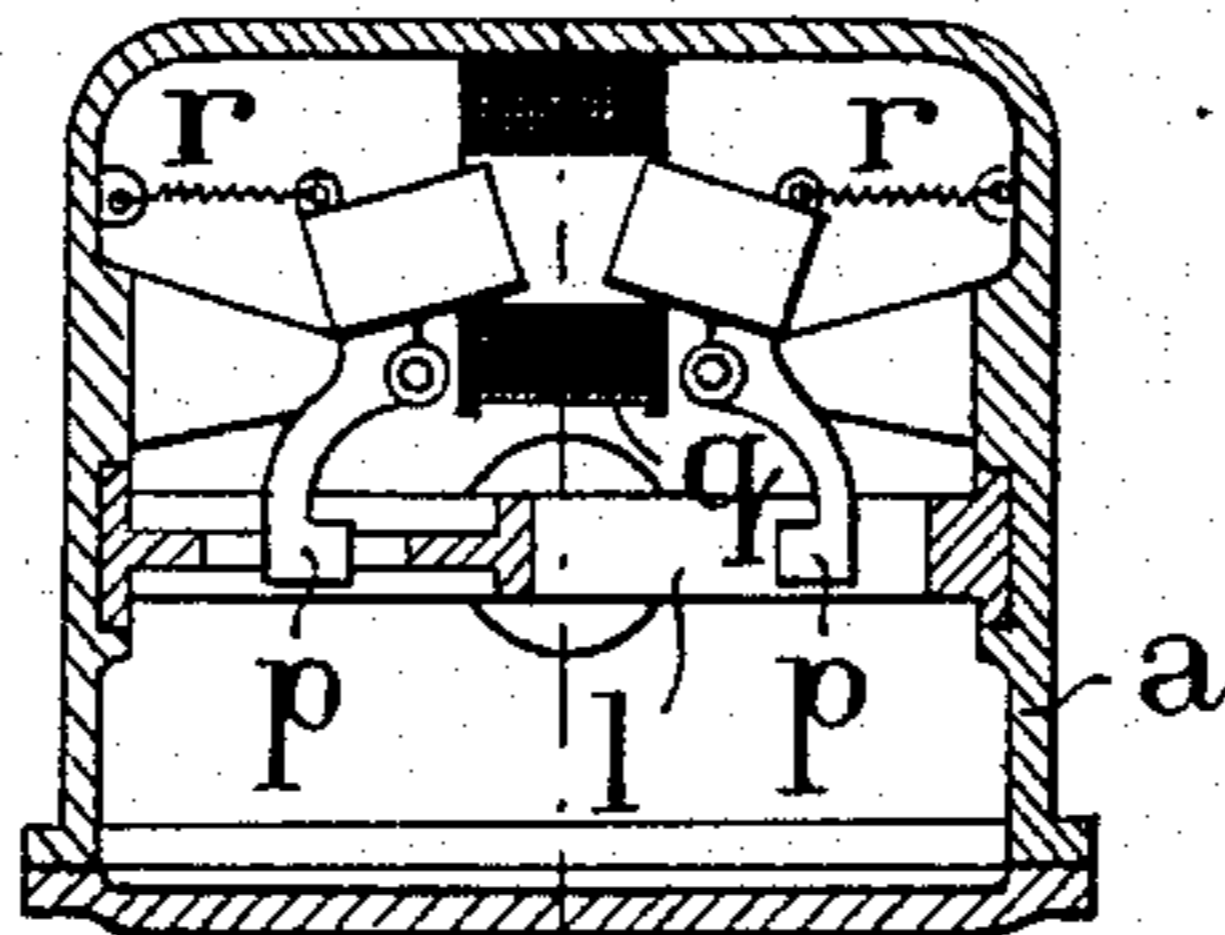


Fig. 4.

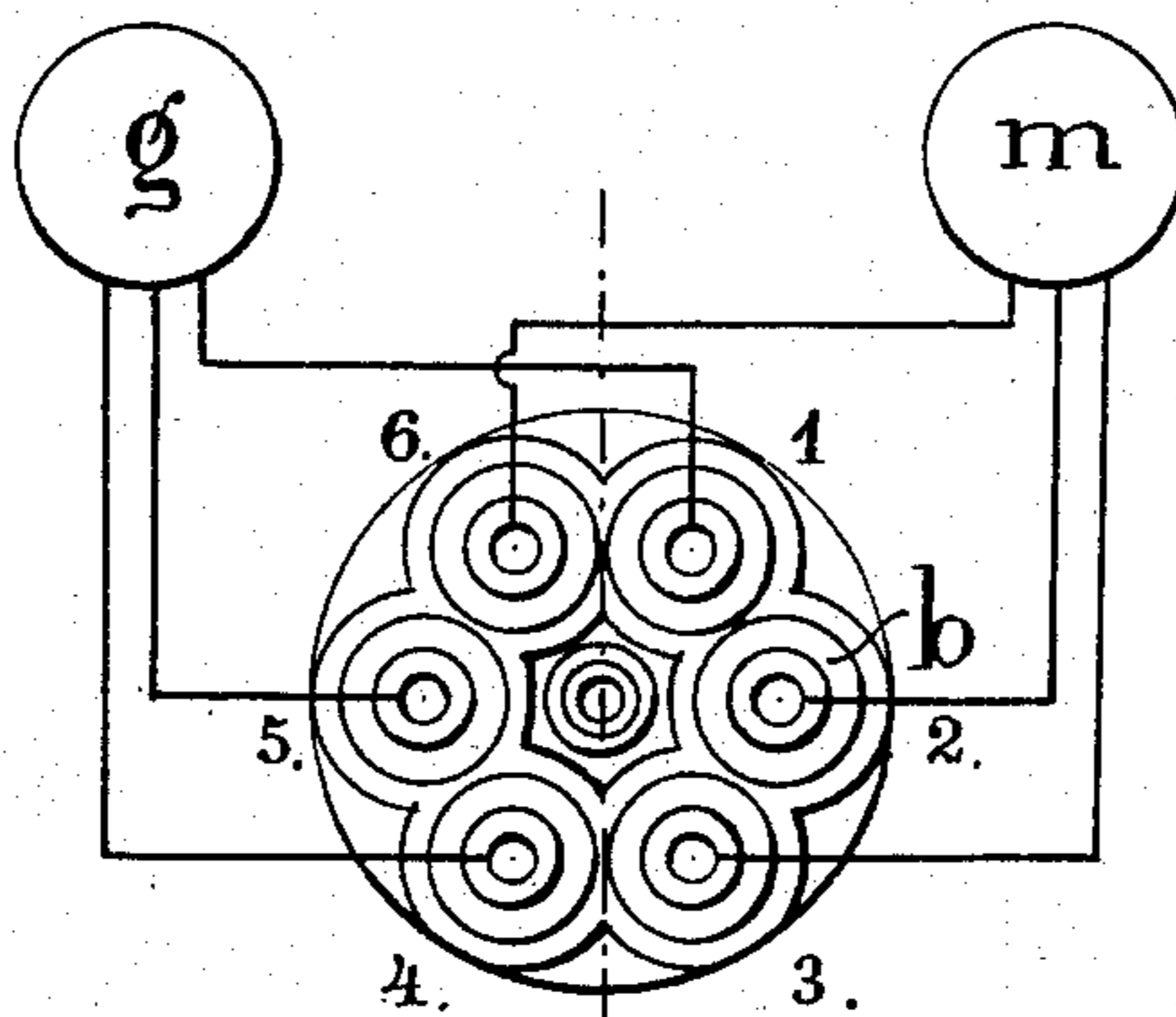


Fig. 5.

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# UNITED STATES PATENT OFFICE.

KOLOMAN VON KANDÓ, OF BUDAPEST, AUSTRIA-HUNGARY.

## SWITCH FOR MULTIPHASE ALTERNATING-CURRENT MOTORS.

SPECIFICATION forming part of Letters Patent No. 677,455, dated July 2, 1901.

Application filed December 31, 1900. Serial No. 41,655. (No model.)

*To all whom it may concern:*

Be it known that I, KOLOMAN VON KANDÓ, a subject of the Emperor of Austria-Hungary, residing at Budapest, in the Kingdom of Hungary, Empire of Austria-Hungary, have invented new and useful Improvements in Switches for Multiphase Alternating-Current Motors, of which the following is a specification.

10 The object of the present invention is to effect economy of space and expense in multiphase reversed-current motors, in which for the purpose of starting and altering the direction besides a switch a maximum-current  
15 interrupter is used to prevent overloading of the motor—i. e., to prevent the intensity of the current rising above a certain limit. This purpose is effected by combining the two devices in question.

20 One form of the combined switch is represented in the annexed drawings, with the switch system of a three-phase motor *m* and a current-generator *g*.

Figure 1 is a vertical section of my new apparatus. Fig. 2 shows by plan views the lower interior rotary portion of the apparatus in two positions. Fig. 3 is a vertical section of the apparatus seen at right angles to Fig. 1. Fig. 4 is a cross-section of the upper part  
30 of the apparatus. Fig. 5 is a diagram showing a system of electrical connections. Fig. 6 is a vertical sectional view of the upper portion of the apparatus, showing the slide *l* in its raised position.

35 In a box *a* six porcelain cylinders *b b* are arranged, to the upper ends of which the cylindrical contacts *c* of the interrupter are attached. The base *e*, fixed to the lower end of the rod *d*, is provided with insulators and  
40 holds the rods *f*, so that on the rod *d* being elevated the rods *f* enter the cylinders *b b* and by making contact with the contacts *c* close the circuit.

45 The rods *f* are interconnected in the manner shown in Fig. 2, so that when the rod *d* has been lowered until the rods *f* leave the cylinders *b* and then turned with the base *e* through sixty degrees and the rods *f* in this position have been caused to reënter the cylinders *b* the two phases of the motor will have  
50 been interchanged and the working direction of the motor thus altered.

The turning of the rod *d* is effected by means of the lever *t*, Fig. 2, which is rigidly connected to the sleeve *h*. The latter engages by means of a conical projection the elongated conical groove in the rod *d*. By means of the lever *t* the rod *d* can therefore be turned and fixed in any position, without  
55 hindering the free longitudinal movement of the rod *d*.

The longitudinal movement of the rod *d* is effected by means of the crank *i*, which is fixed to the same axle as the crank *k*. In revolving in the direction of the hands of a  
65 clock the said crank *k* enters the slot *u* in the slide *l* and moves the latter upward. The rod *d* is articulated to the lower part of the slide *l* in such a manner that the said rod follows the slide in its longitudinal movements,  
70 but can be revolved freely around its own axis by means of the lever *t*. In its highest position the crank *k* leaves the slot *u* in the slide *l*, so that the rod *d* would fall down by its own weight and under the influence of the  
75 spring *n*. In order, however, to prevent the descent of the slide, and thereby of the rod *d*, spring-clicks *o o* are pivoted to the slide *l*. These clicks are engaged by jaws *p p*, which are pivoted to brackets secured to the walls  
80 of the box *a* and are provided with springs *r*. (See Fig. 4.) As soon as the power of the current has passed a certain limit the jaws *p p* are drawn apart by the solenoid or the electromagnet *q*, acting against the springs *r*, Fig.  
85 3. The rod *d* then falls down unhindered, so that the rods *f* interrupt the current independently of the cranks *i* and *k*, by which means, on the one hand, the operator is prevented from receiving a shock and, on the other hand,  
90 the automatic interruption of current by hand is obviated.

The interruption of the current by hand is effected by turning the crank *i* farther in the direction of the hands of a clock, so that the  
95 crank *k* exercises downward pressure upon the slide *l*. As soon as this pressure, combined with the inertia of the movable parts and the power of the spring *n*, is superior to the tension of the spring *s*, which forces the  
100 clicks *o o* apart, the latter clap together, the jaws *p p* turn aside, and the rod *d* falls down, by which means the current is interrupted.

Having thus described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. A switch for multiphase-current motors, comprising a spindle having axial and longitudinal motion, a frame carried by said spindle, metal insulated rods mounted on said frame, stationary insulating-sockets provided with electrical contacts and adapted to receive said rods and so complete the circuit on longitudinal motion of the spindle, means for rotating said spindle on its axis, means for imparting longitudinal motion to said spindle, a device for retaining the spindle when it has been thus operated and an electromagnet releasing said device on the passage of a current above a certain maximum intensity, whereby the spindle is set free and can return to its first position and break the connection between said socket-contacts and metal rods, all substantially as described.

2. A switch for multiphase-current motors, comprising a spindle having axial and longitudinal motion, a frame carried by said spindle, metal insulated rods mounted on said frame, stationary insulating-sockets provided with electrical contacts and adapted to receive said rods and so complete the circuit on longitudinal motion of the spindle, means for rotating said spindle on its axis, a slide articulated to said spindle, guideways for said slide, means for sliding said slide and spindle, a stationary pivotal spring device

for retaining the spindle when it has been thus operated, a spring-engagement device pivoted to said slide and cooperating with said retaining device, and an electromagnet releasing said device on the passage of a current above a certain maximum intensity, whereby the spindle is set free and can return to its first position and break the connection between said socket-contacts and metal rods, all substantially as described.

3. The devices for longitudinally sliding, retaining and releasing the spindle of, comprising a slotted slide articulated to the spindle, guideways for said slide, crank mechanism engaging in said slot and traveling said slide in its guideways, spring-clicks pivoted to said slide, stationary pivotal double-armed spring-jaws engaging with said clicks on travel of the slide, armatures carried by said jaw-arms and an electromagnet which, on the passage of a current above a certain maximum intensity, opens said jaws by attracting said armatures, thus releasing said clicks and allowing the spindle to return to its first position, all substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

KOLOMAN VON KANDÓ.

Witnesses:

EUGENE HARRISINJI,

FRANK DYER CHESTER.