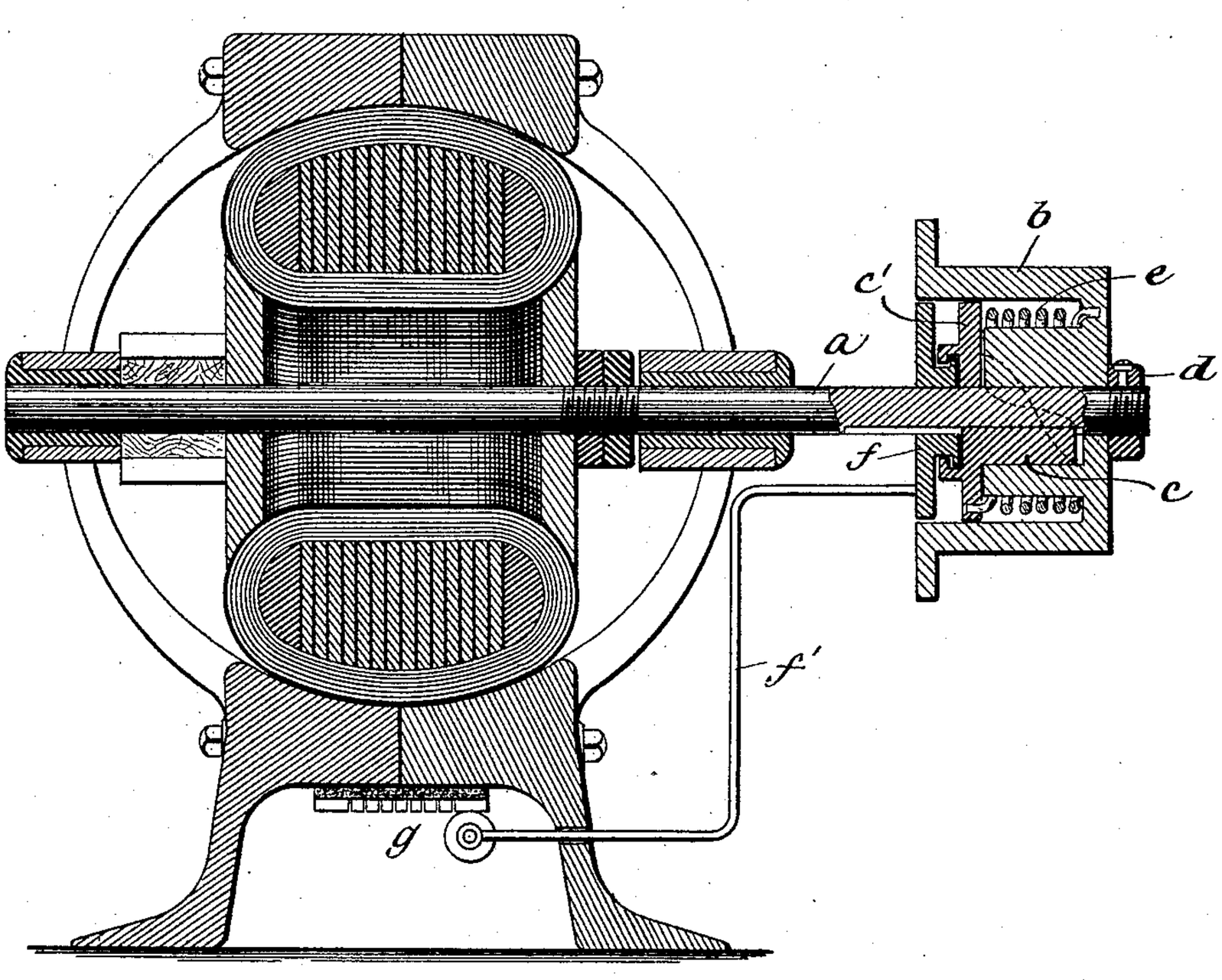
(No Model.) 2 Sheets—Sheet 1.

W. E. HYER.

REGULATOR FOR ELECTRIC MOTORS.

No. 441,665. Patented Dec. 2, 1890.

Fig. 1.



WITNESSES:

Frank A. Olds

Wm. A. Rosenbaum

INVENTOR

Walter E. Hyer,

BY

W. J. Johnston

ATTORNEY.

(No Model.) 2 Sheets—Sheet 2.

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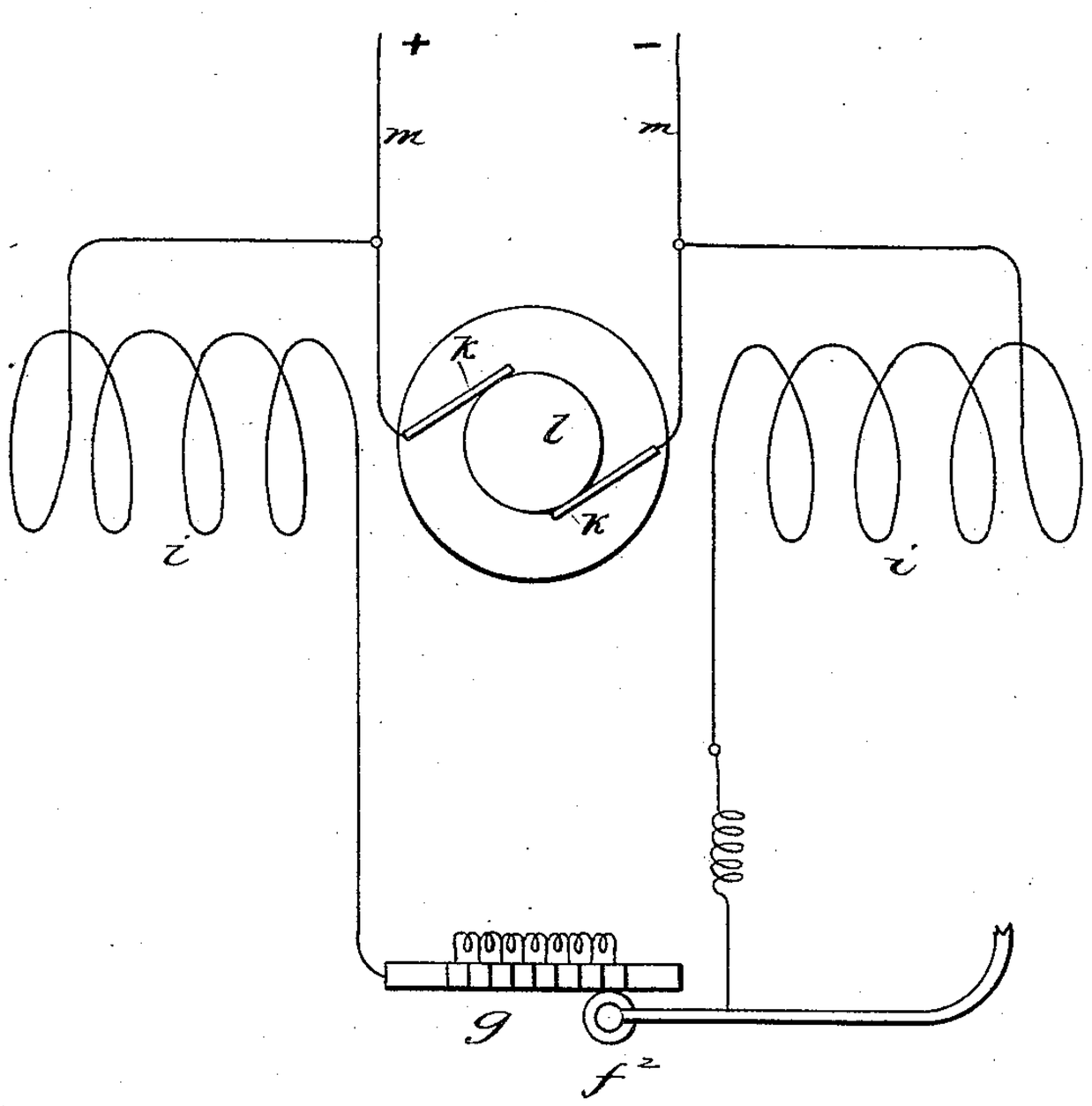

Fig. 2.

WITNESSES:
Paul S. Ober.
Wm. A. Rosenbaum

INVENTOR
Walter E. Hyer.
BY
W. J. Johnston
ATTORNEY.

UNITED STATES PATENT OFFICE.

WALTER E. HYER, OF NEWBURG, NEW YORK.

REGULATOR FOR ELECTRIC MOTORS.

SPECIFICATION forming part of Letters Patent No. 441,665, dated December 2, 1890.

Application filed October 10, 1889. Serial No. 326,622. (No model.)

To all whom it may concern:

Be it known that I, WALTER E. HYER, a citizen of the United States, residing in Newburg, in the county of Orange and State of New York, have invented certain new and useful Improvements in Regulators for Electric Motors; and I do hereby declare that the following is a full, clear, and exact description of my invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention pertains to the regulation of electric motors.

The object of the invention is to provide a simple mechanical device located between the load and the motor and operated directly by the former.

The device which I have invented is connected with the pulley over which the belt passes for transmitting the power of the motor to the load. The pulley is connected with the shaft through a coil-spring and a sliding block feathered on the shaft. The said block is provided with a cam-surface which bears against a similar surface on the pulley. The rotation of the pulley is opposed by the spring, and the amount of lost motion allowed by the spring in consequence of the load determines the distance which the sliding block moves longitudinally on the shaft, this motion being caused by a movement of the cam-surface of the pulley against the corresponding surface on the sliding block. The movement of the sliding block may be utilized in any way desirable to switch in or out resistance, the preferable means being an arm connected with the block and carrying a roller for contact with a rheostat, all as hereinafter more fully described.

Referring to the accompanying drawings, Figure 1 represents a sectional view of a pulley and mechanism connected therewith for operating a rheostat, and Fig. 2 is a diagram illustrating the circuits of Fig. 1.

a represents a shaft of an electric motor. On this shaft is usually mounted a pulley which drives a belt for transmitting power to the work or load. The pulley is represented by *b*. It is mounted loosely on the shaft, and its hub is cut away to form a cam-surface, as shown in dotted lines in Fig. 1. There is also mounted on the shaft by means of a feather a hub or block *c*, which is provided with a cam-surface corresponding to the surface on the hub of the pulley. These two surfaces constantly bear upon each other, and any rotary movement of the pulley will tend to push the block *c* outward. The block is usually provided with a flange *c'*. The pulley is held on the shaft by means of a set-nut *d*.

In a space between the hub of the pulley and its outer band or tire is placed a coil-spring *e*, one end of which is secured to the pulley and the other is secured in the flange of the block *c*. The strength of this spring is determined by the amount of work to be overcome by the motor—that is to say, the spring about balances the normal load.

f is a disk on the shaft connected with the block *c*. To this disk is attached an arm *f'*, controlling the switch or carrying a contact-roller f^2. This switch, roller, or finger is adapted in its motion to operate a rheostat *g* in any of the well-known ways.

It will be seen from this construction that the power of the motor must necessarily be transmitted through the block *c*, the spring *e*, pulley *a*, and the belt, and that opposition to this power—such as excessive loads—will cause the spring to give in accordance therewith, forcing the pulley to rotate a slight distance independently of the block *c* and shaft, and therefore through the cam-faces to cause the block *c* to slide longitudinally on the shaft in an outward direction and move the arm controlling the switch or cut-out, as before described, thus altering the speed of the motor to agree with the load.

As indicated in Fig. 2, the field-magnets (shown diagrammatically at *i i*) are connected one with the rehostat *g* and the other with the arm of roller f^2, the brushes and commutator being indicated, respectively, at *k* and *l*, and the main wires at *m*, the connection of the field-magnets with the main wires causing more or less of the current to be taken as a shunt to the armatures through the rheostat, according to the position of the roller f^2 with respect to said rheostat.

Having now described my invention, I claim—

1. The combination, with the driving-shaft of an electric motor, of a pulley loosely mounted on said shaft and having a cam, a

block feathered on the shaft and having a cam engaging the pulley-cam, and a spring connecting the pulley and block and located inside the pulley, substantially as described.

2. The motor-shaft and the block *c*, feathered thereon and provided with a cam-surface, as described, in combination with the pulley *a*, loosely mounted on the shaft, provided with a corresponding cam-surface, the spring *e*, connecting the pulley and block and located inside the pulley, and means, substantially as described, connected with the block for regulating the current of electricity supplied to the motor.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WALTER E. HYER.

Witnesses:
JOHN K. LARGE,
MINNIE S. LARGE.