

(No Model.)

F. KÜHMAIER.

2 Sheets—Sheet 1.

ELECTRIC MOTOR.

No. 289,918.

Patented Dec. 11, 1883.

Fig. 1.

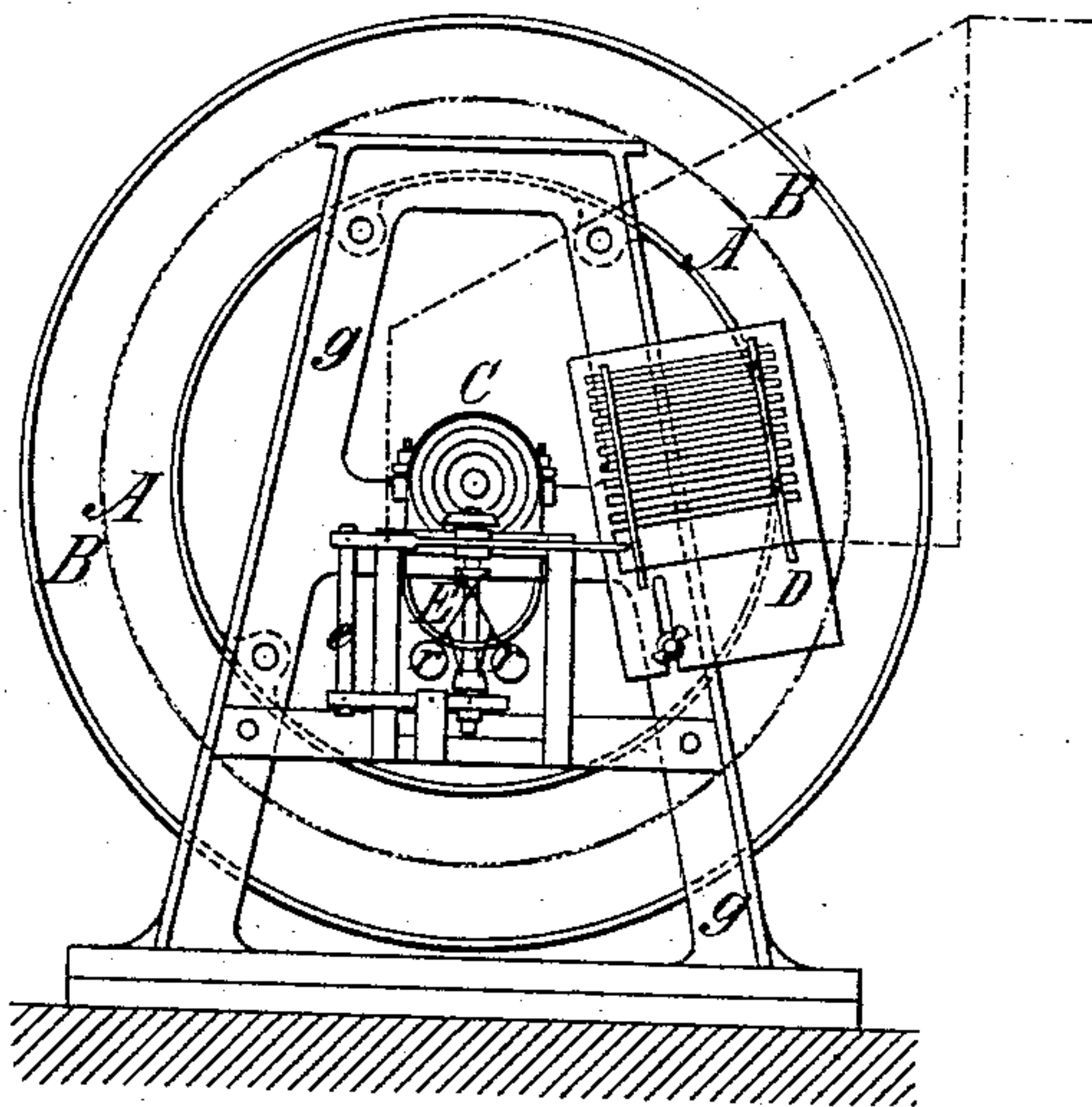


Fig. 2.

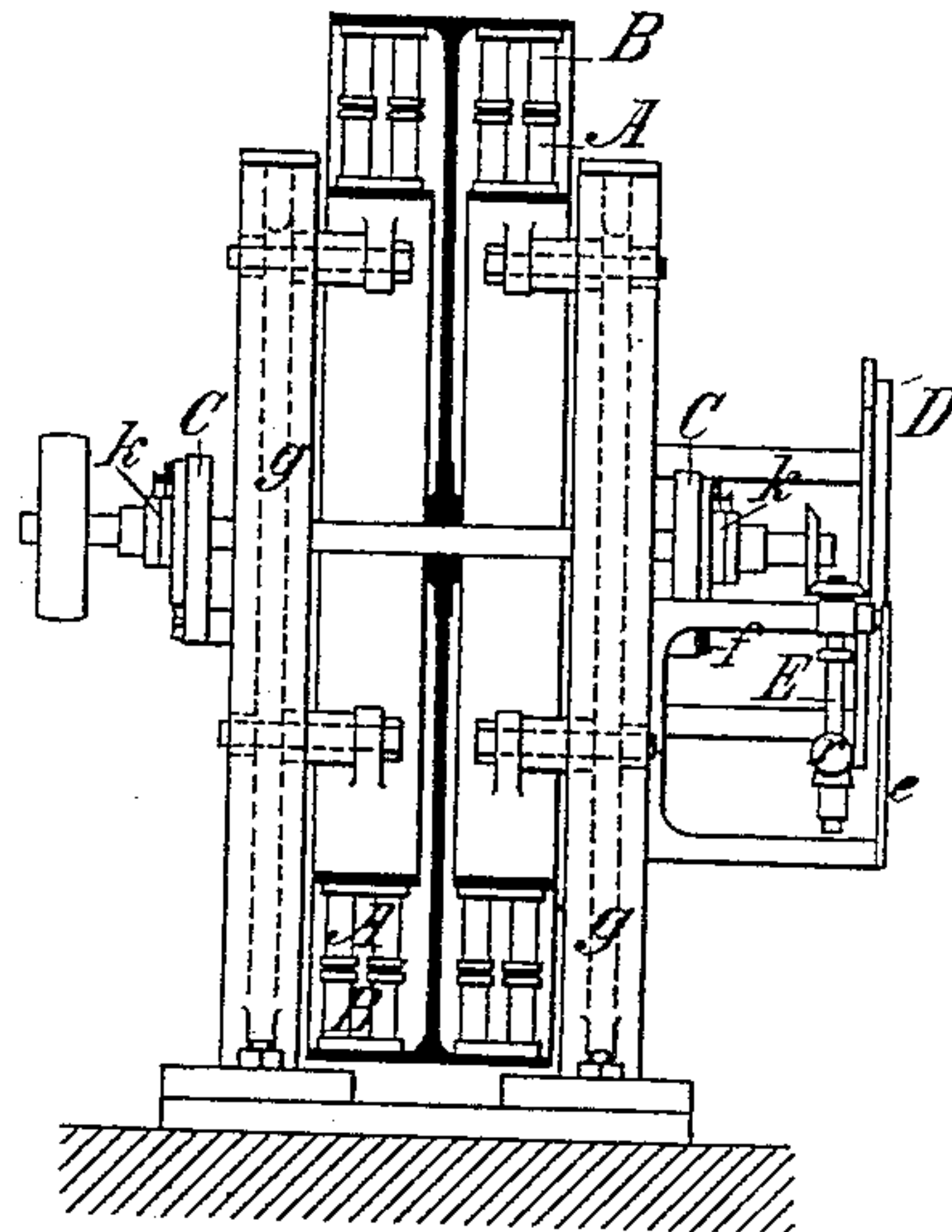


Fig. 6.

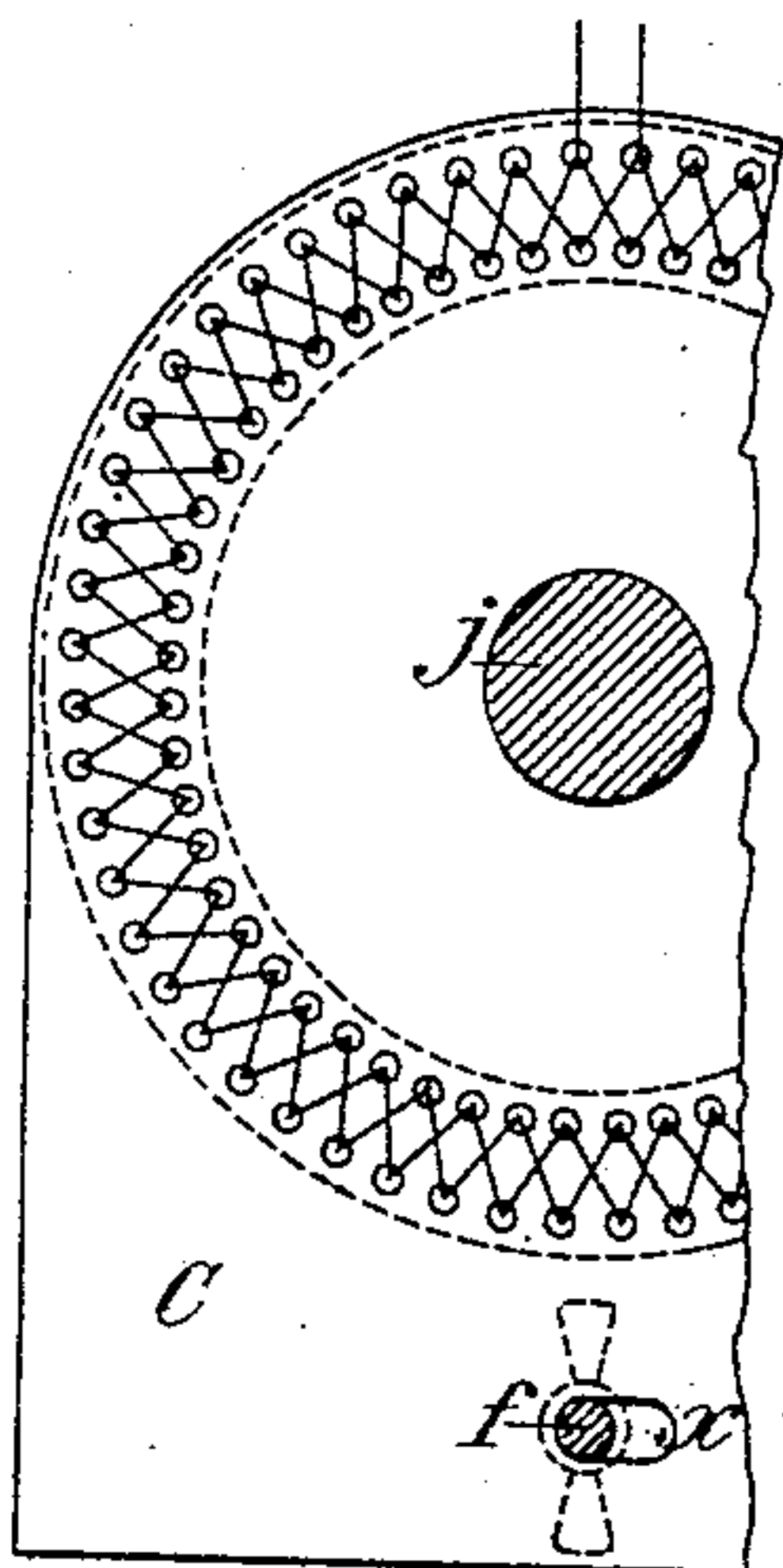


Fig. 7.

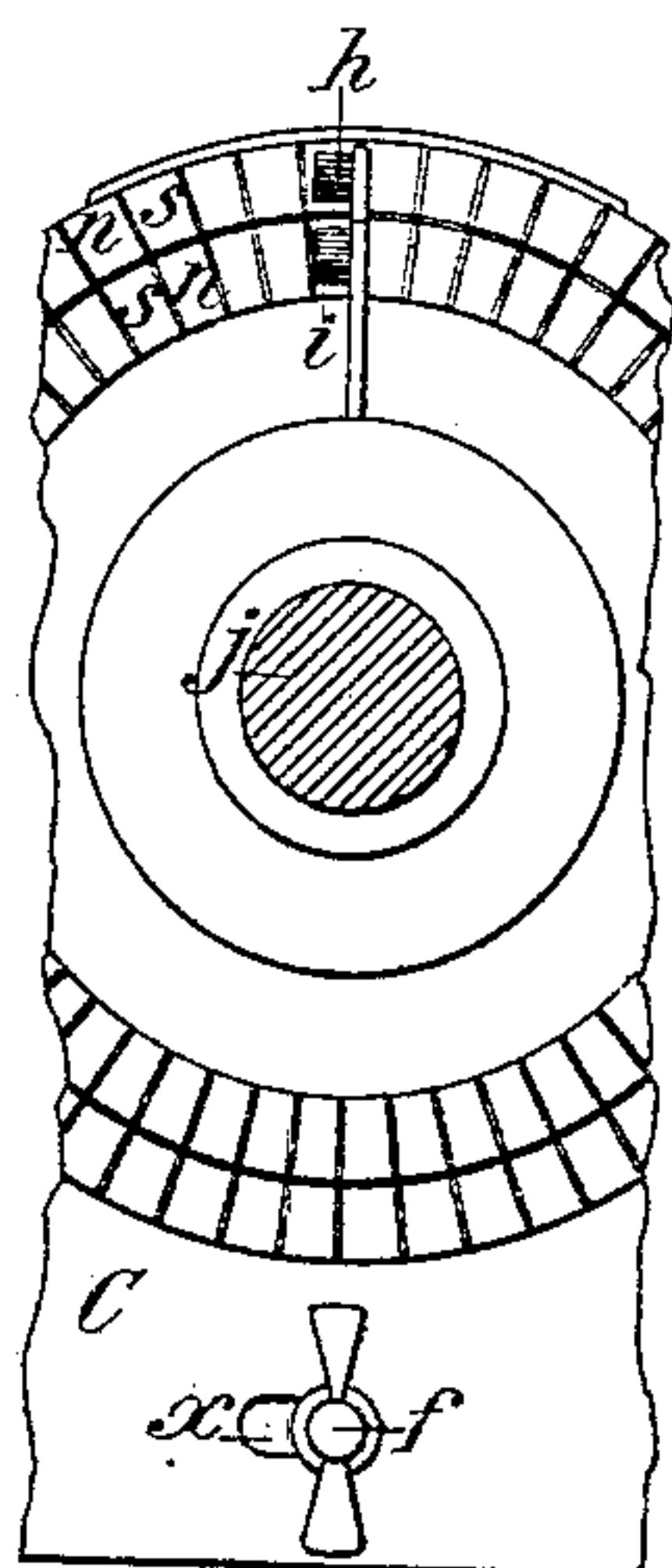
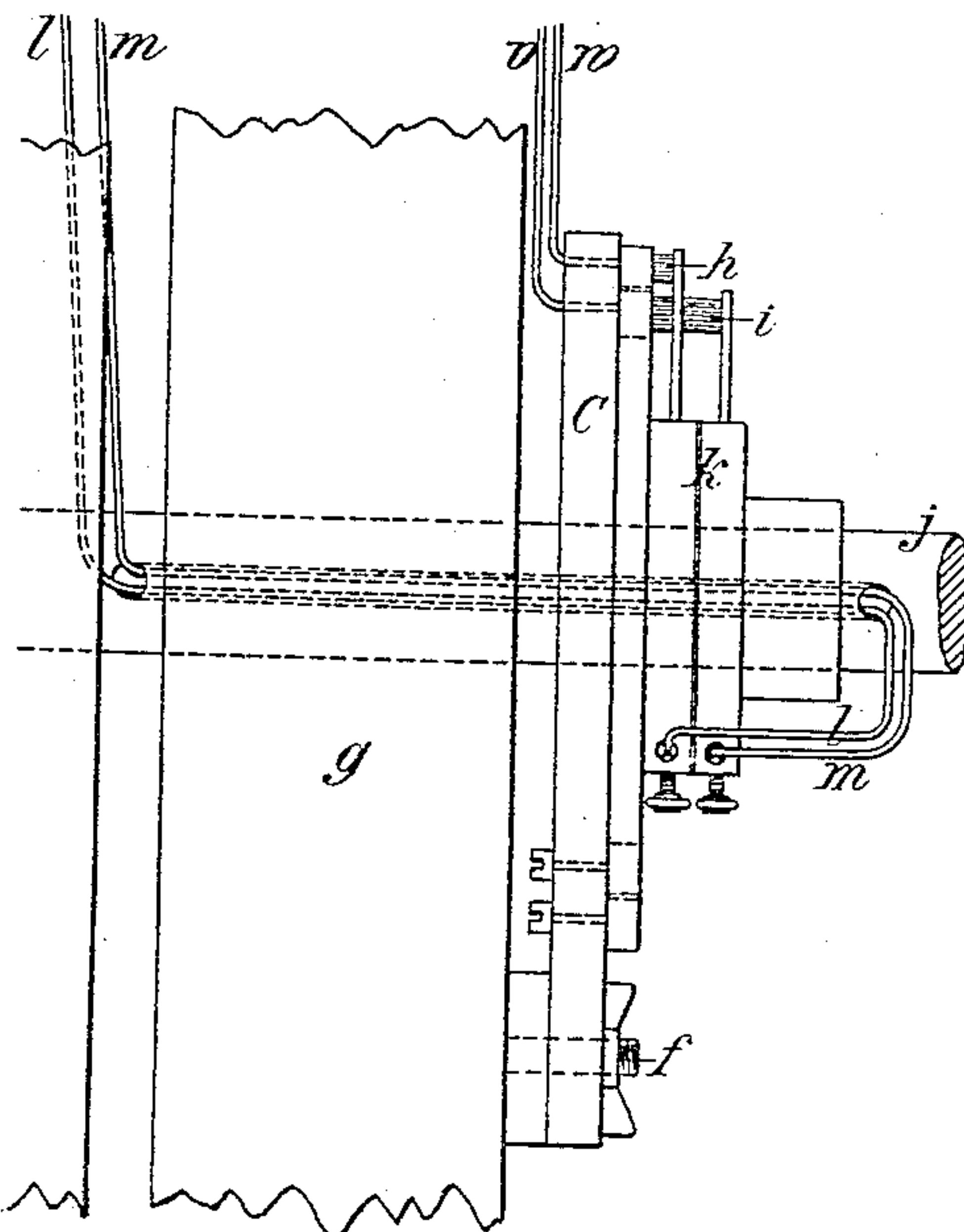


Fig. 8.



Witnesses

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Wm. C. Mahan.

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attys

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Fig. 4.

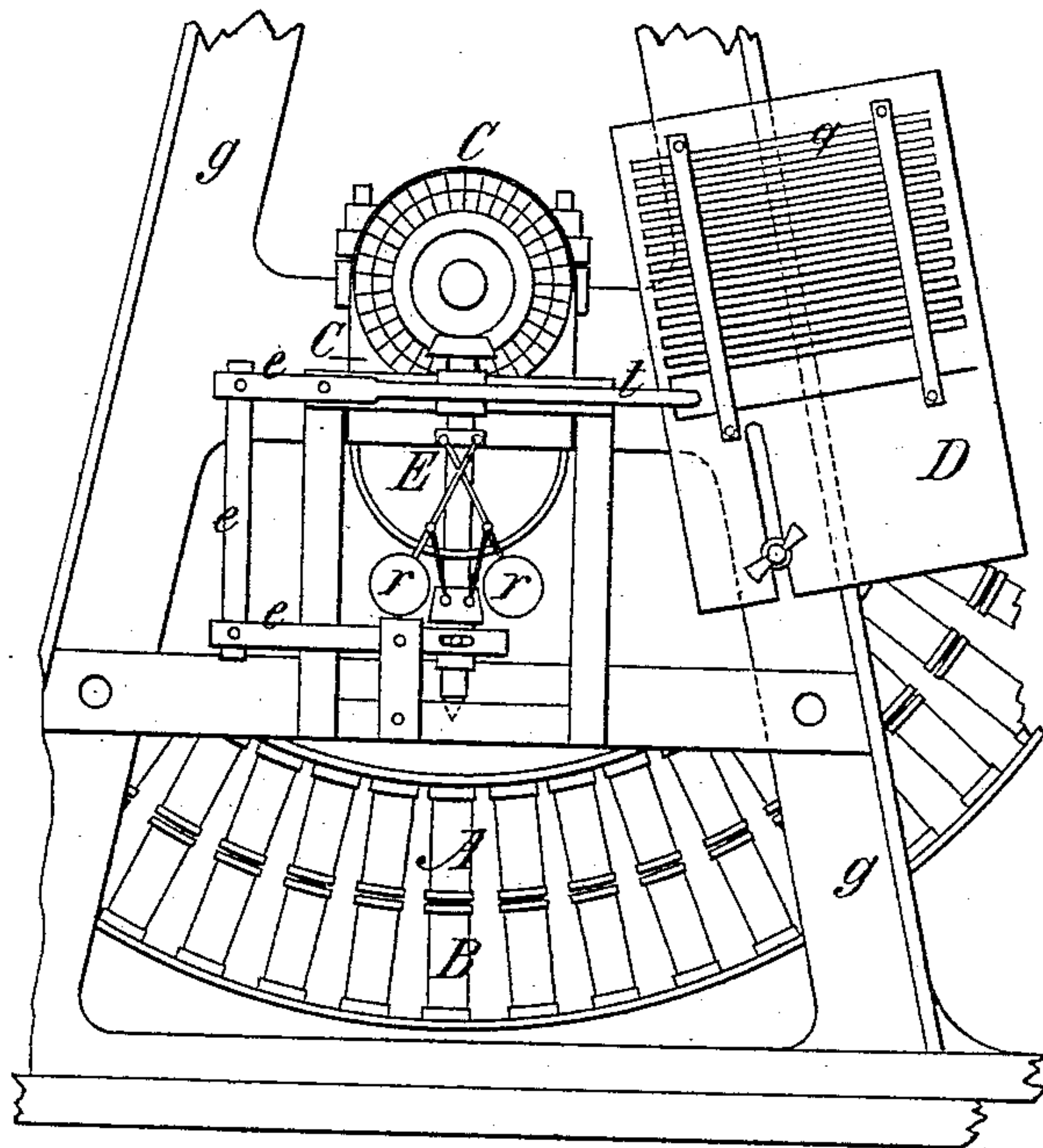


Fig. 9.

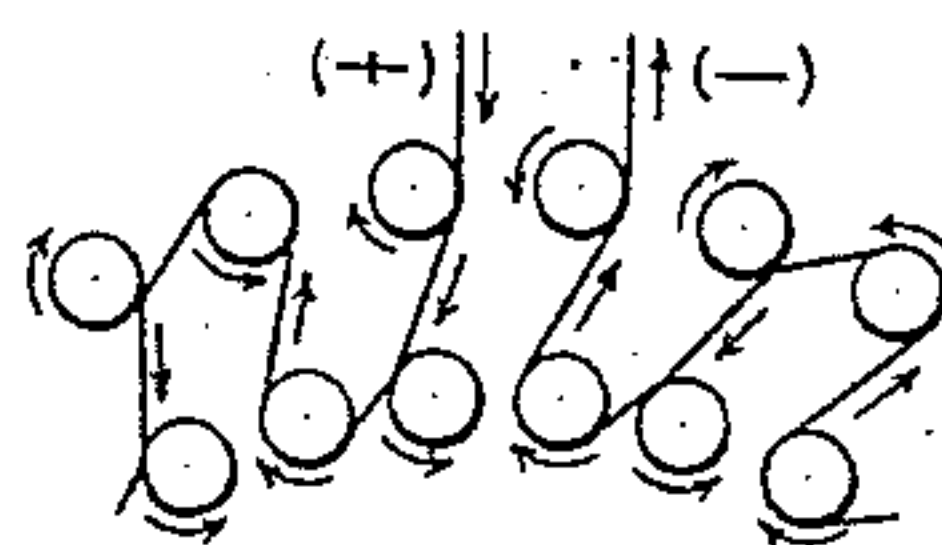


Fig. 3.

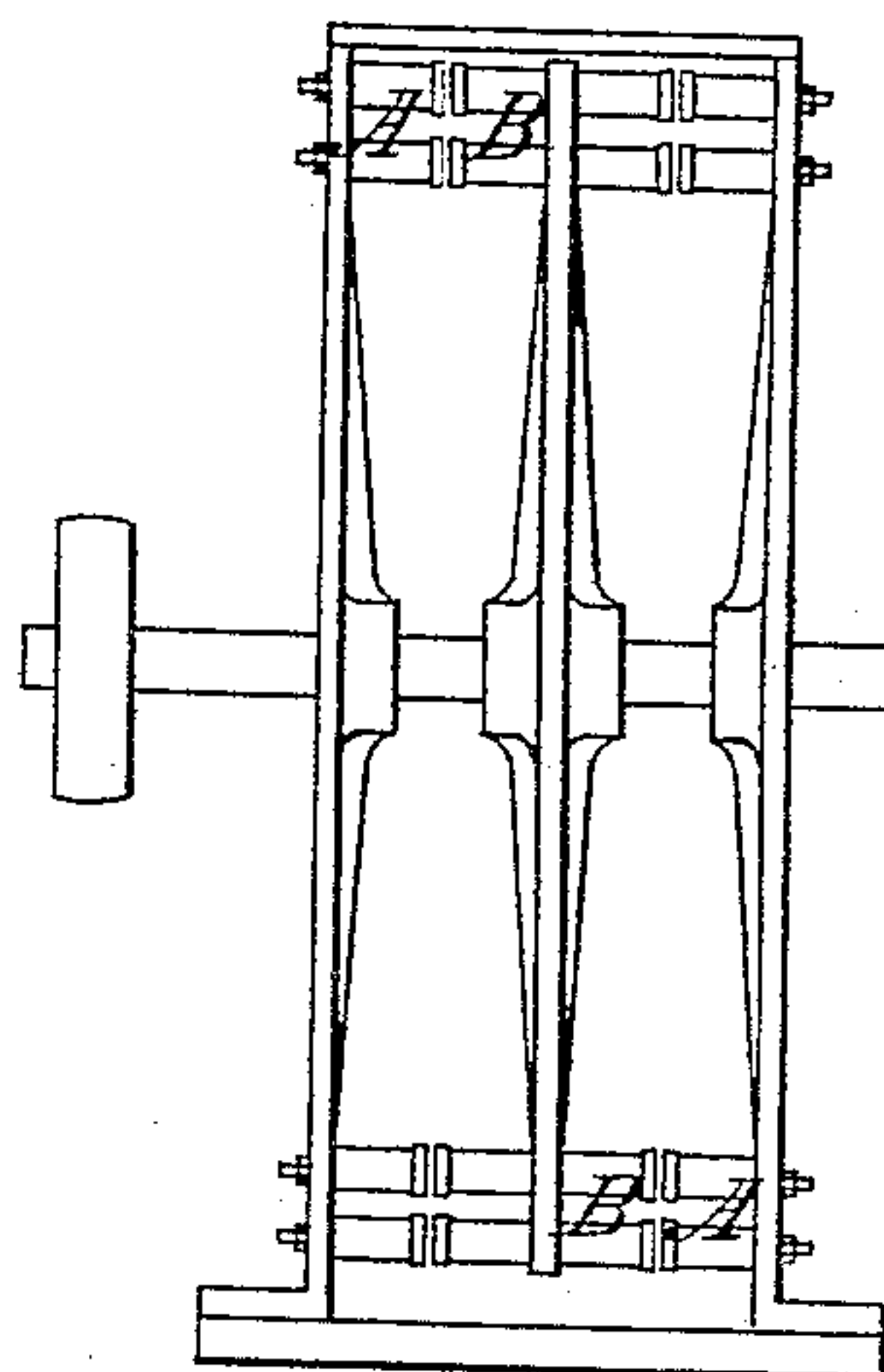
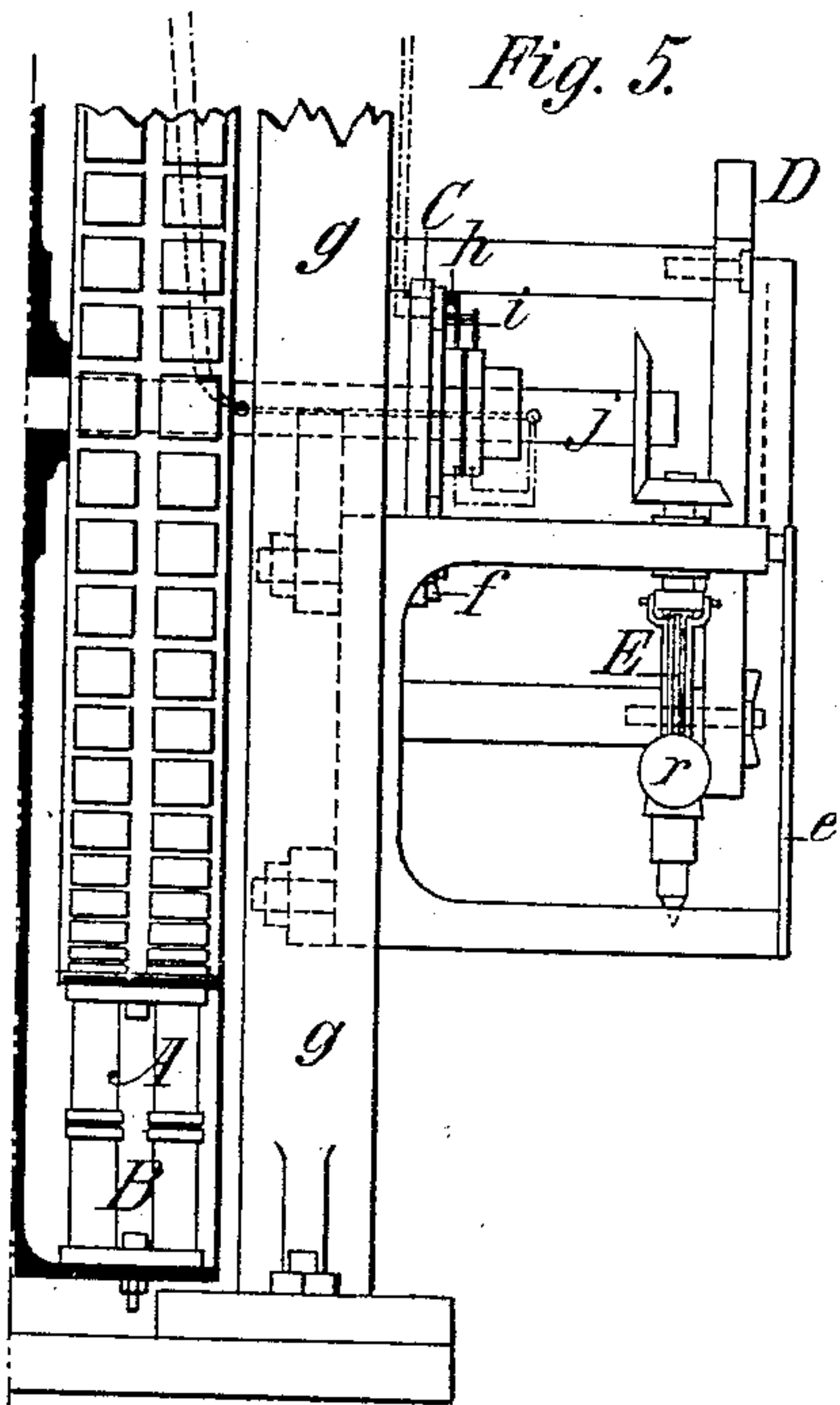


Fig. 5.



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INVENTOR

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UNITED STATES PATENT OFFICE.

FRANZ KÜHMAIER, OF PRESSBURG, HUNGARY, ASSIGNOR OF ONE-HALF
TO ALFRED SKENE, OF KENNA, AUSTRIA.

ELECTRIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 289,918, dated December 11, 1883.

Application filed March 6, 1883. (No model.)

To all whom it may concern:

Be it known that I, FRANZ KÜHMAIER, a subject of the King of Hungary, and a resident of the city of Pressburg, in the Kingdom of Hungary, have invented certain new and useful Improvements in Electromotors, of which the following is a specification.

In the accompanying drawings, Figure 1 is a side view, and Fig. 2 is a front view, of the electromotor. Fig. 3 shows a modification of the arrangement of the magnets. Figs. 4, 5, 6, 7, 8, and 9 are detail views on a larger scale.

In all the figures the same letters denote similar parts.

A are the fixed or field magnets, and B are the revolving electro-magnets. In all the fixed or field magnets A the polarities are kept constant, while in the revolving electro-magnets the polarities are continuously changed by means of the commutator C.

D is a rheostat, by the downward movement of which gradually-increased resistances may be thrown into circuit.

E is a governor connected with the rheostat, so as to throw greater or smaller resistances into circuit, corresponding to the greater or smaller rate of speed of the motor.

As may be seen in Figs. 6, 7, and 8, the commutator C consists of the disk C, secured to the standard *g* by the binding-screw *f*. The front side of the disk C is, as shown in Fig. 7, provided with insulated metal strips *n* and *s*, connected at the back with the conducting-wires leading to the magnets whose north and south poles, respectively, are opposed to each other, as shown in Fig. 6. The brushes *h* and *i* are attached to the disks *k*, secured to the revolving shaft *j*, with which they revolve. The brushes are connected to the conducting-wires *l* and *m*, which pass through the shaft *j* and lead to the revolved magnets B.

It is obvious that when the commutator C, Fig. 7, is laterally moved as far as the slot *x* permits the brush *h* will rest upon a strip, *s*, instead of resting upon a strip, *n*, and that the brush *i* will slide from a strip, *s*, to a strip, *n*. By thus shifting the commutator the current fed by the conducting-wires *v* and *w* will be reversed, in consequence of which a reversal of polarity in the revolving magnets B will take

place, which magnets are connected with the commutator C by the conducting-wires *l* and *m*. By this reversal of polarities the attraction and repulsion existing between the revolving magnets B and the fixed or field magnets A will be reversed, and consequently the magnets B will be revolved in the opposite direction.

Figs. 4 and 5 show the arrangement for regulating the speed of the motor by means of a rheostat, D. The rheostat D is connected by the wire *d* with the battery, and by the metal strip *t* it is connected with the fixed magnets A. The rheostat D consists, essentially, of the wire *g*, which is thick at the lower end and grows thinner toward the upper end. As well known, the resistance is greater the thinner the conducting-wire is. Consequently the more the rheostat D is lowered the greater the resistance offered by it to the electric current will be. Thus the current passing through the motor will be the weaker the lower the rheostat D or the higher the strip *t* is placed. The raising of the strip *t* is accomplished by the governor E. The greater the speed of the motor is the farther will the balls *r r* of the governor fly asunder, and as they are connected by the links *e e'* to the strip *t*, the latter will be pushed correspondingly higher when the rate of speed of the motor is great, and thus the current will be caused to pass through a correspondingly longer and thinner wire. When the rate of speed is small, the balls *r r* and the strip *t* will sink down, and a smaller resistance is then offered to the current. The direction in which the current passes through the coils is in Fig. 9 indicated by arrows, in which figure a part of the whole ring of magnets is shown, and in which the coils and their connections are so arranged that the magnet-poles are alternately north and south.

It will be observed that the rheostat D is not alone automatic—that is, controlled by the governor E so as to regulate the speed of the motor—but that it is also adjustable, so that the automatic control may be regulated, or brought within the limits of any given rate of speed which it may be desired to obtain.

I claim—

1. The combination, with an electric motor,

of a rheostat, D, for regulating the rate of speed, said rheostat being capable of both manual and automatic adjustment, substantially as and for the purpose described.

- 5 2. The combination of the governor E with the movable conductor *t* and rheostat D, for controlling the speed of an electromotor, said rheostat being capable of both automatic and manual adjustment, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

FRANZ KÜHMAIER.

Witnesses:

C. O. PAGET,
E. G. KOELLER.

Correction in Letters Patent No. 289,918.

It is hereby certified that in Letters Patent No. 289,918, granted December 11, 1883, upon the application of Franz Kühmaier, of Pressburg, Austria-Hungary, for an improvement in "Electric Motors," the residence of the assignee (Alfred Skene) of one-half interest in said invention was written and printed "Kenna, Austria;" that it should have been written and printed *Vienna, Austria*; and that the proper correction has been made in the files and records pertaining to the case in the Patent Office, and should be read in the patent to make it conform thereto.

Signed, countersigned, and sealed this 18th day of December, A. D. 1883.

[SEAL.]

M. L. JOSLYN,
Acting Secretary of the Interior.

Countersigned:

BENJ. BUTTERWORTH,
Commissioner of Patents.