

(No Model.)

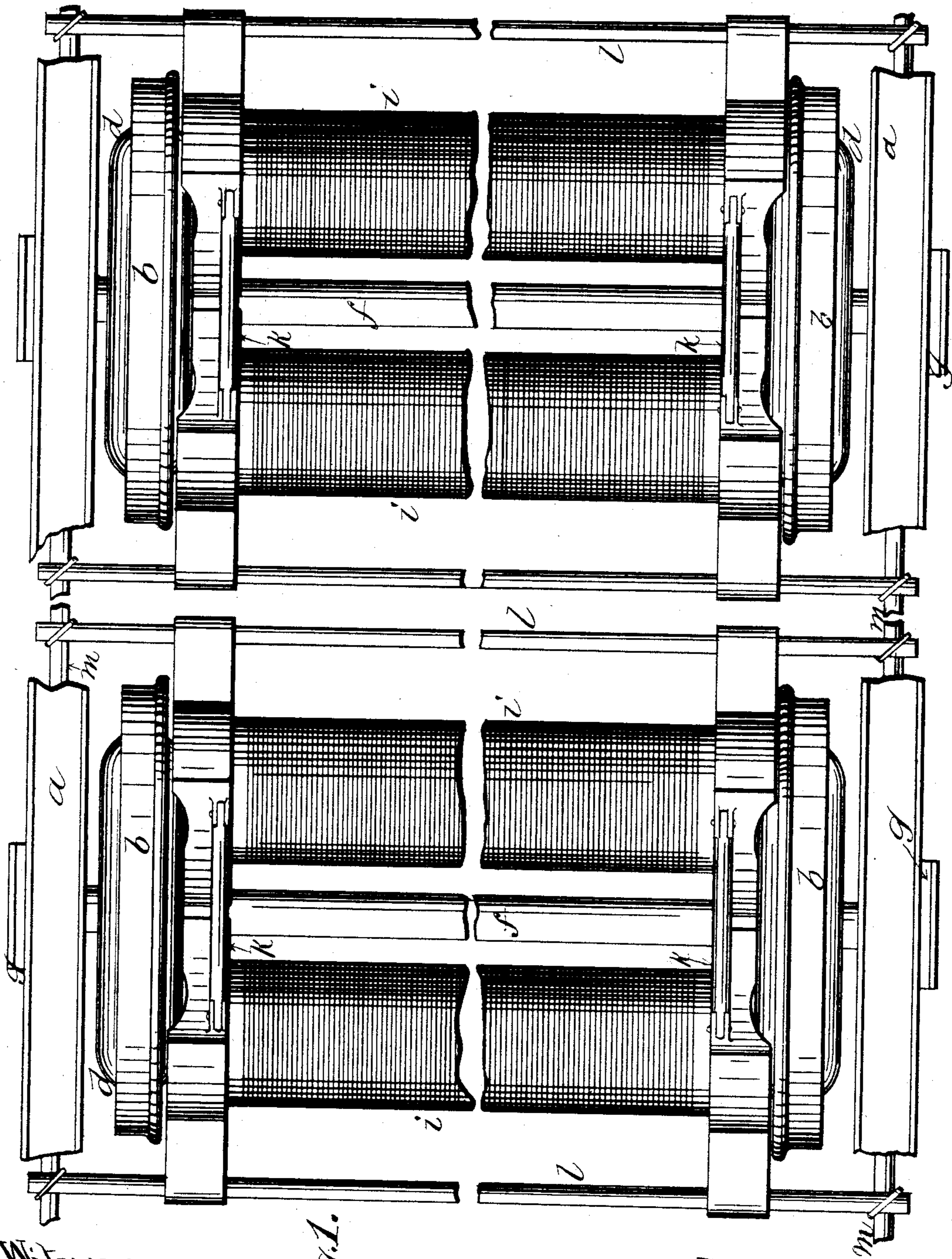
E. WAGEMANN.

3 Sheets—Sheet 1.

MOTOR ARMATURE CAR WHEEL.

No. 436,728.

Patented Sept. 16, 1890.



Witnesses:

D. W. Gardner

Willis L. Tappan

Fig. 1.

Inventor:

Edmund Wagemann

By his Attorney

Edward P. Thompson.

(No Model.)

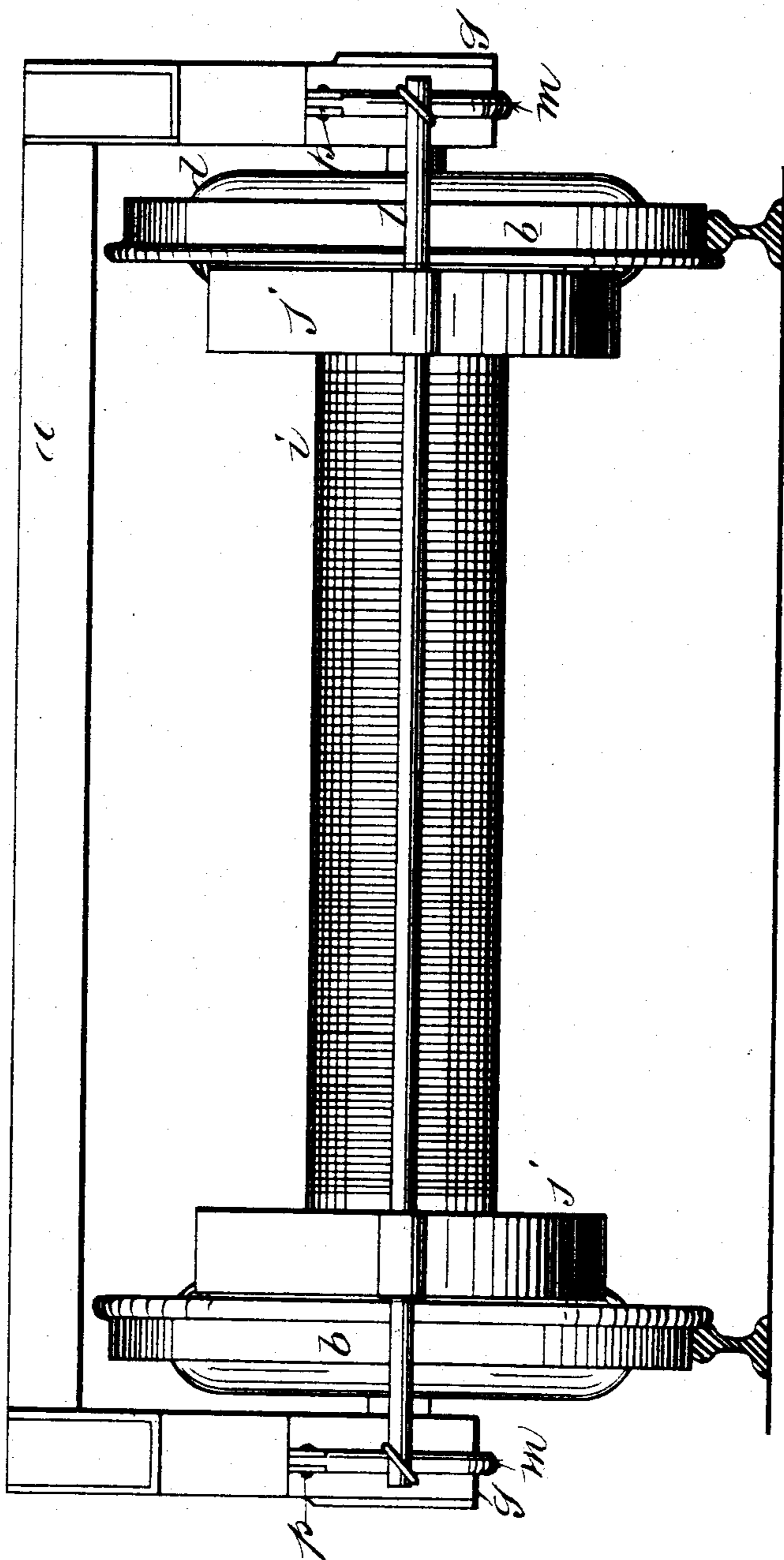
3 Sheets—Sheet 2.

E. WAGEMANN.
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Fig. 2.



Witnesses:

D. W. Gardner

Nellie L. Pope

Inventor:

Edmund Wagemann

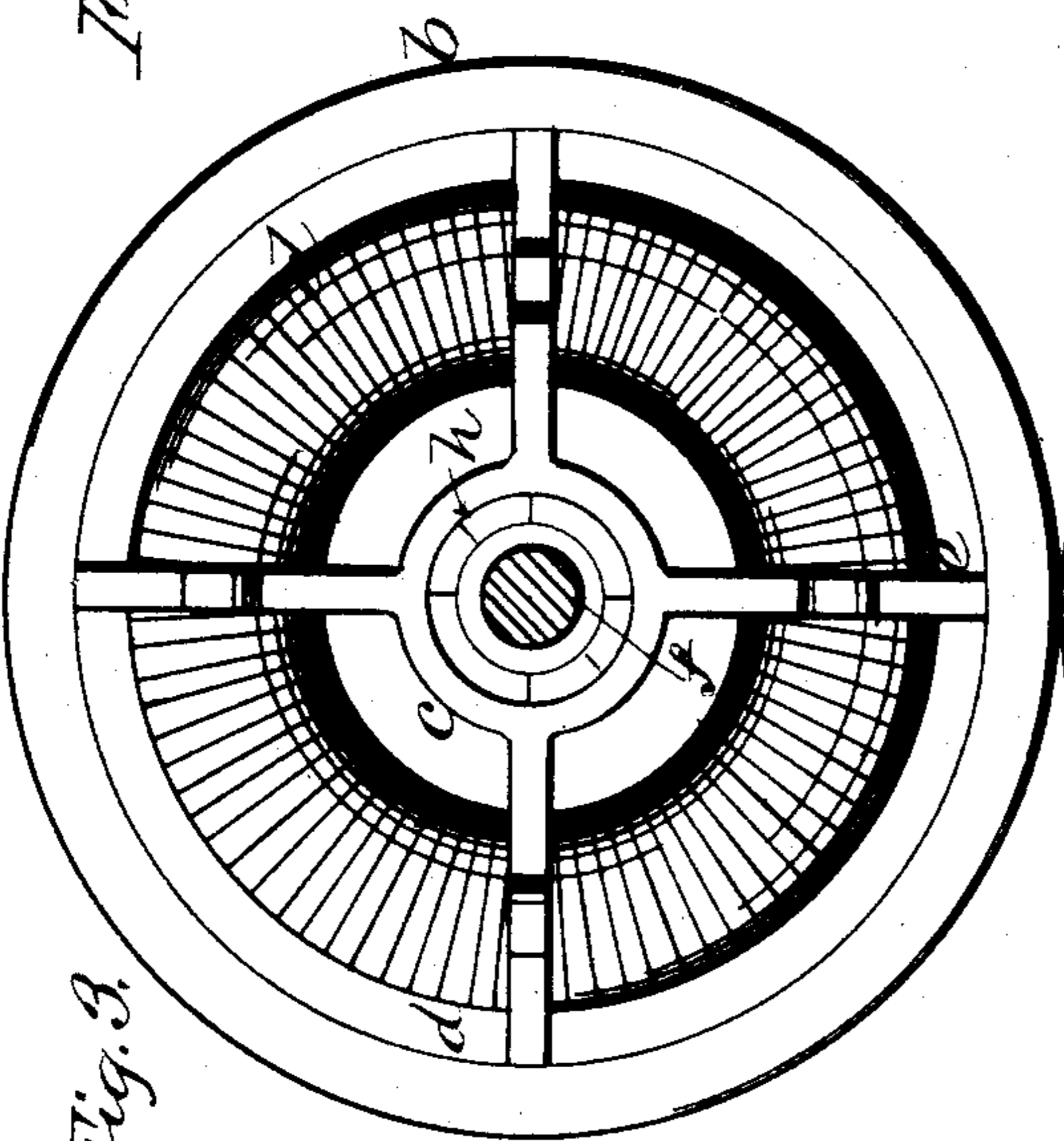
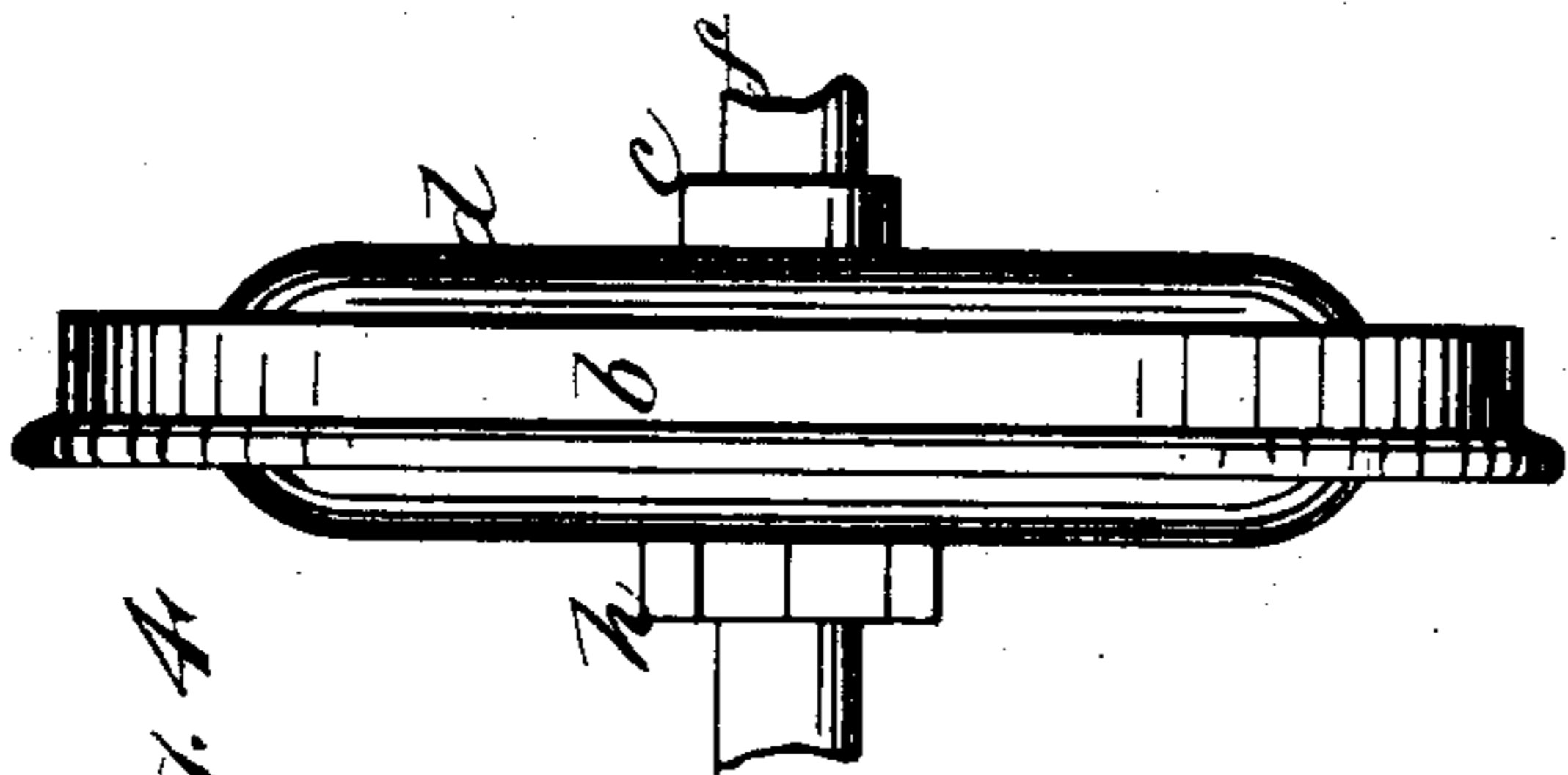
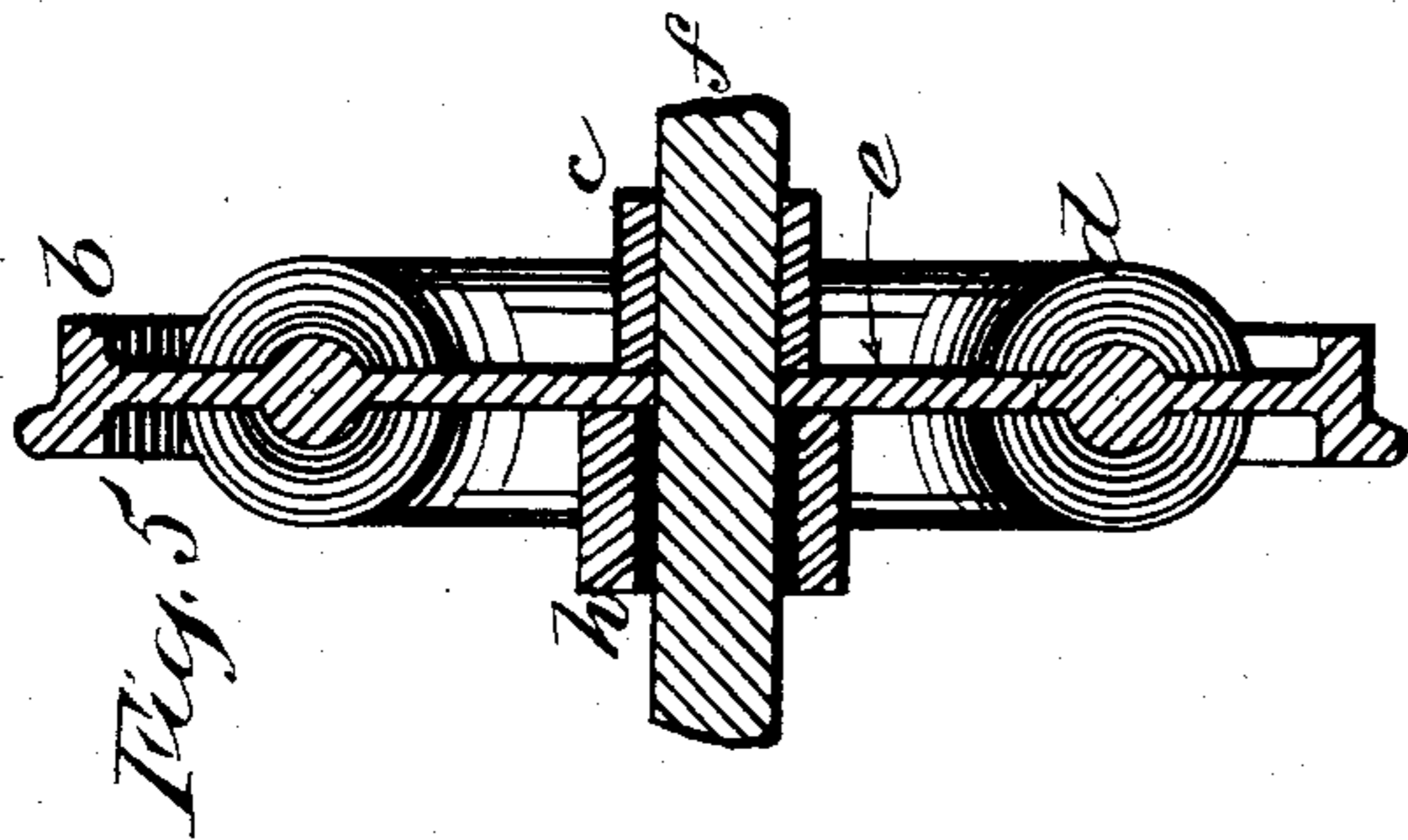
By his Attorney,

Edward P. Thompson

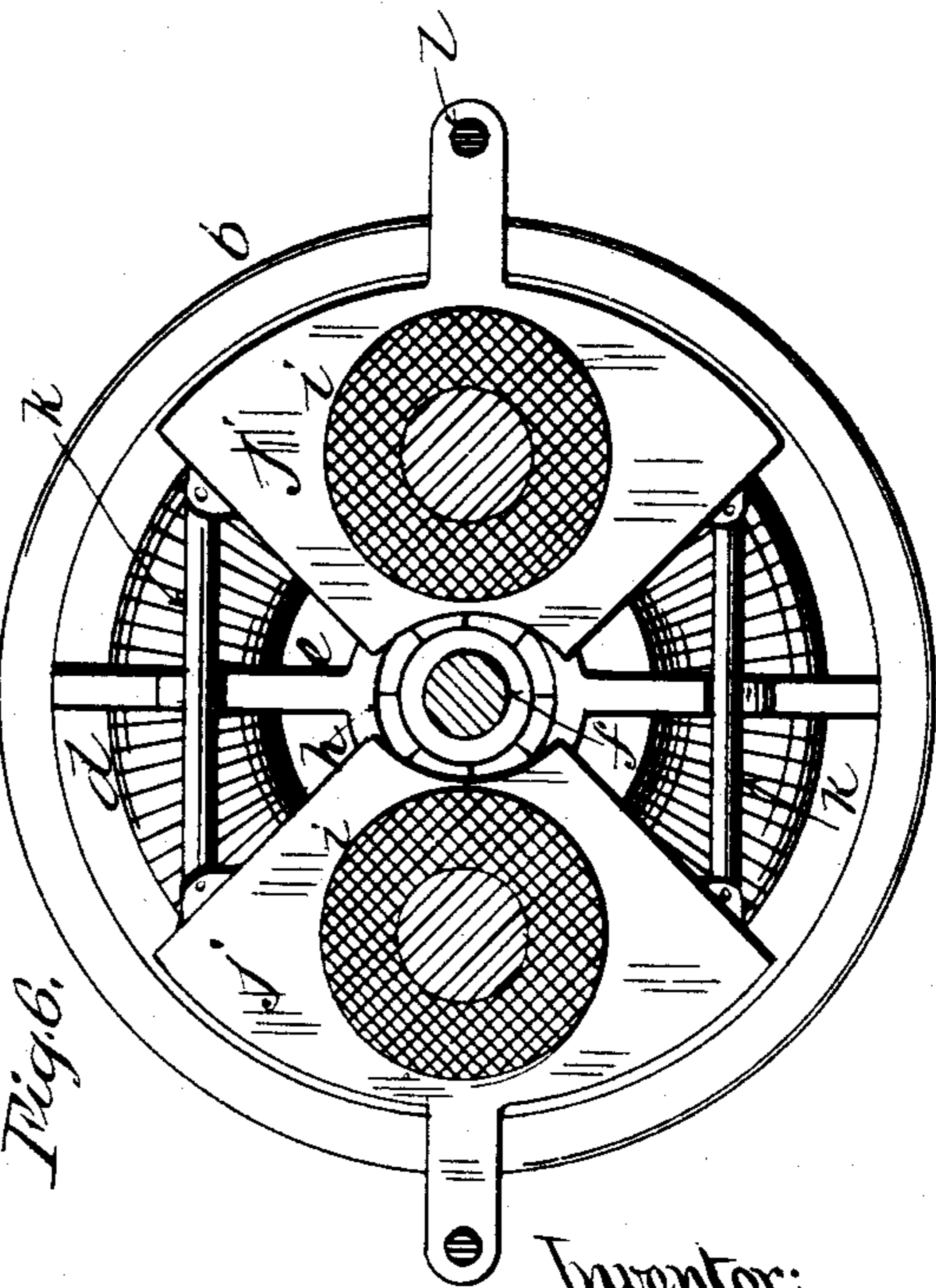
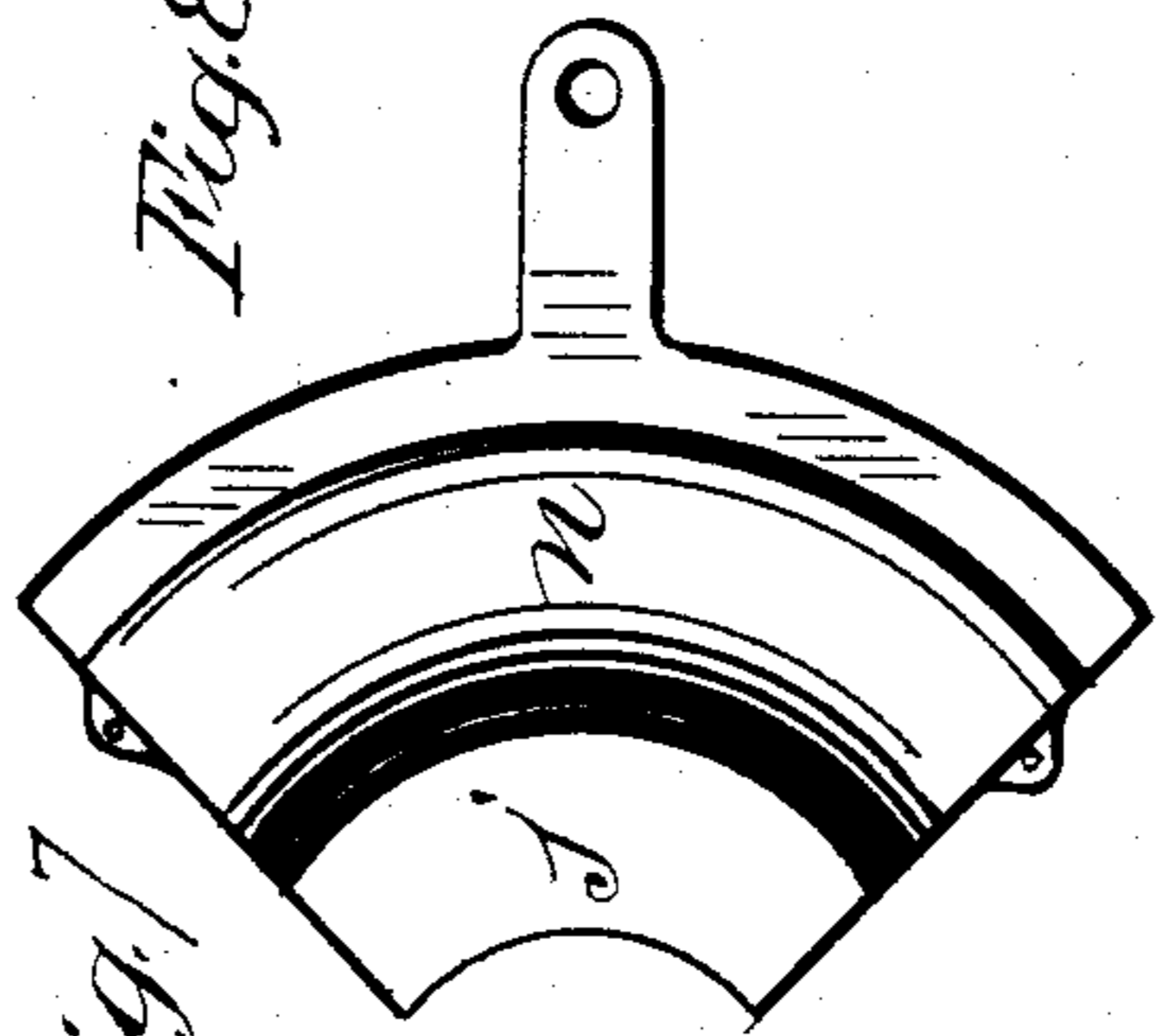
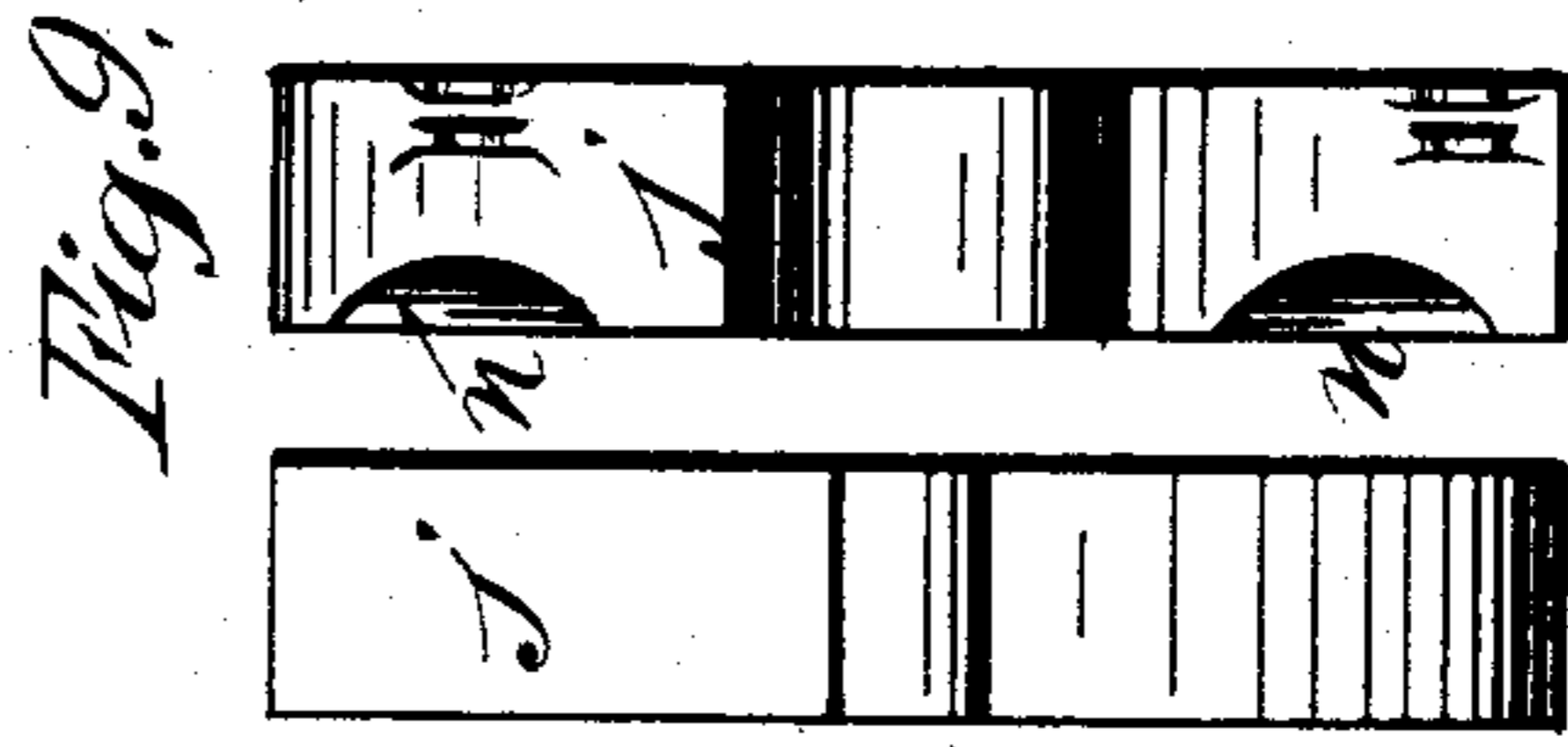
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O. L. T. P.



Inventor:
Edmund Wagemann
By his Attorney,
Edward P. Thompson

UNITED STATES PATENT OFFICE.

EDMUND WAGEMANN, OF LITTLE ROCK, ARKANSAS, ASSIGNOR OF SIX-SEVENTHS TO JOHN D. ADAMS, DEAN ADAMS, OSCAR DAVIS, JOHN W. DAVIS, HORACE G. ALLIS, AND JOHN B. JONES, OF SAME PLACE.

MOTOR-ARMATURE CAR-WHEEL.

SPECIFICATION forming part of Letters Patent No. 436,728, dated September 16, 1890.

Application filed October 17, 1889. Serial No. 327,382. (No model.)

To all whom it may concern:

Be it known that I, EDMUND WAGEMANN, a subject of the Emperor of Germany, and a resident of Little Rock, county of Pulaski, and State of Arkansas, have invented certain new and useful Improvements in Motor-Armature Car-Wheels, (Case 13,) of which the following is a specification.

The invention relates to the type of electric car in which the armatures of the electric motors are a part of the wheels of the car.

The object of the invention is to provide improved mechanical construction in such a type and to so design the same as to involve field-magnets of considerable length, substantially as long as the width of the car.

The invention is represented in all its details in the accompanying drawings, in which—

Figure 1 is a plan view of the wheels and motors and portion of the truck. Fig. 1 shows the middle portion broken away so as to bring the figure within the limits of the sheet. Fig. 2 is an end elevation of the device shown in Fig. 1—*i. e.*, the truck is supposed to be viewed in the direction of the length of the car. The track is shown in section. Fig. 3 is a view of the wheel equipped with the armature, all the wheels of the car being so provided with an armature each. The view is in vertical elevation. Fig. 4 is an end elevation—*i. e.*, a rectangular view of Fig. 3. Fig. 5 is a vertical section of Fig. 3. Fig. 6 is a section through the central portion of Fig. 2. The section is vertical. It illustrates the shape and relative positions of the two pole-pieces and the means of fastening the pole-pieces together. Fig. 7 is a view of the pole-piece by itself, while Figs. 8 and 9 are different views of the same thing as Fig. 7.

The device shown in the above figures consists of the combination of a truck *a*, provided with wheels in the manner of ordinary cars, the wheels consisting of tires or hoops *b*, hubs *c*, and spokes connecting the tires to the hub. Between the spokes and attached to the same are armature-coils each coil being in the form of an arc of a circle, having for its center the center of the wheel. The planes of the armature, taken perpendicular to the axis thereof, are substantially coincident with the similar

planes of the wheel. The armature is represented by the letter *d* and the spokes by *e*. Through the hubs and attached thereto are axles *f*, which are carried in the boxes or bearings *g*. The commutator *h* is attached to the axle in each case. The coils of the field-magnets and armatures may be connected up to the commutator and generator in any well-known manner. The field-magnets *i* are parallel to the axles, being in the form of spools or solenoids. Their pole-pieces *j* are fastened together by non-magnetic material *k*—such as phosphor-bronze—and are also fastened to cross-rods *l*, which in turn are carried by longitudinal rods or beams *m* belonging to the truck.

The pole-pieces are provided with circular grooves *n*, which partly envelop the armatures. All the field-magnets preferably lie in the same horizontal plane. They would be too close to the ground if any were placed under the axles.

There is one field-magnet on each side of each axle taken horizontally, and a pole-piece on each end of each magnet, so that each armature is in the field of force of two poles. The magnets being so long is no objection, but rather an advantage. The object of having motors on all the wheels is to insure a quick starting up of the car when the current is turned on, and also so that grades may be ascended with little difficulty and with the same speed as on a level. On account of the peculiar location of the armature the space occupied thereby is little more than that which would any way be taken up by the wheel. The combined weight of armature and wheel made in this manner is less considerably than if the two were entirely separate devices. The rods *m* are prolonged and curved to the end of the truck and attached thereto at the joint *p*. The field-magnets are therefore held stationary in reference to the car.

It is unnecessary to go into the description of the principle of operation of the motors, as they operate exactly as the ordinary motor.

The invention is confined to the improved mechanical construction, as hereinbefore set forth.

I claim as my invention—

1. In an electric car, the combination of car-wheels provided with motor-armatures lying within the tires of the wheels and attached thereto, field-magnets parallel to the
5 axles of the wheels and having pole-pieces at each end and within inductive proximity to the said armatures, and rods attached to the truck of the car and carrying the said field-magnets.
- 10 2. In an electric car, the combination of car-wheels provided with motor-armatures lying within the tires of the wheels and attached

thereto, and field-magnets parallel to the axles of the wheels and having pole-pieces at each end and within inductive proximity to the said 15 armatures.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 22d day of August, 1889.

EDMUND WAGEMANN.

Witnesses:

E. G. DUVALL, Jr.,
NELLIE L. POPE.