No. 834,355. PATENTED OCT. 30, 1906

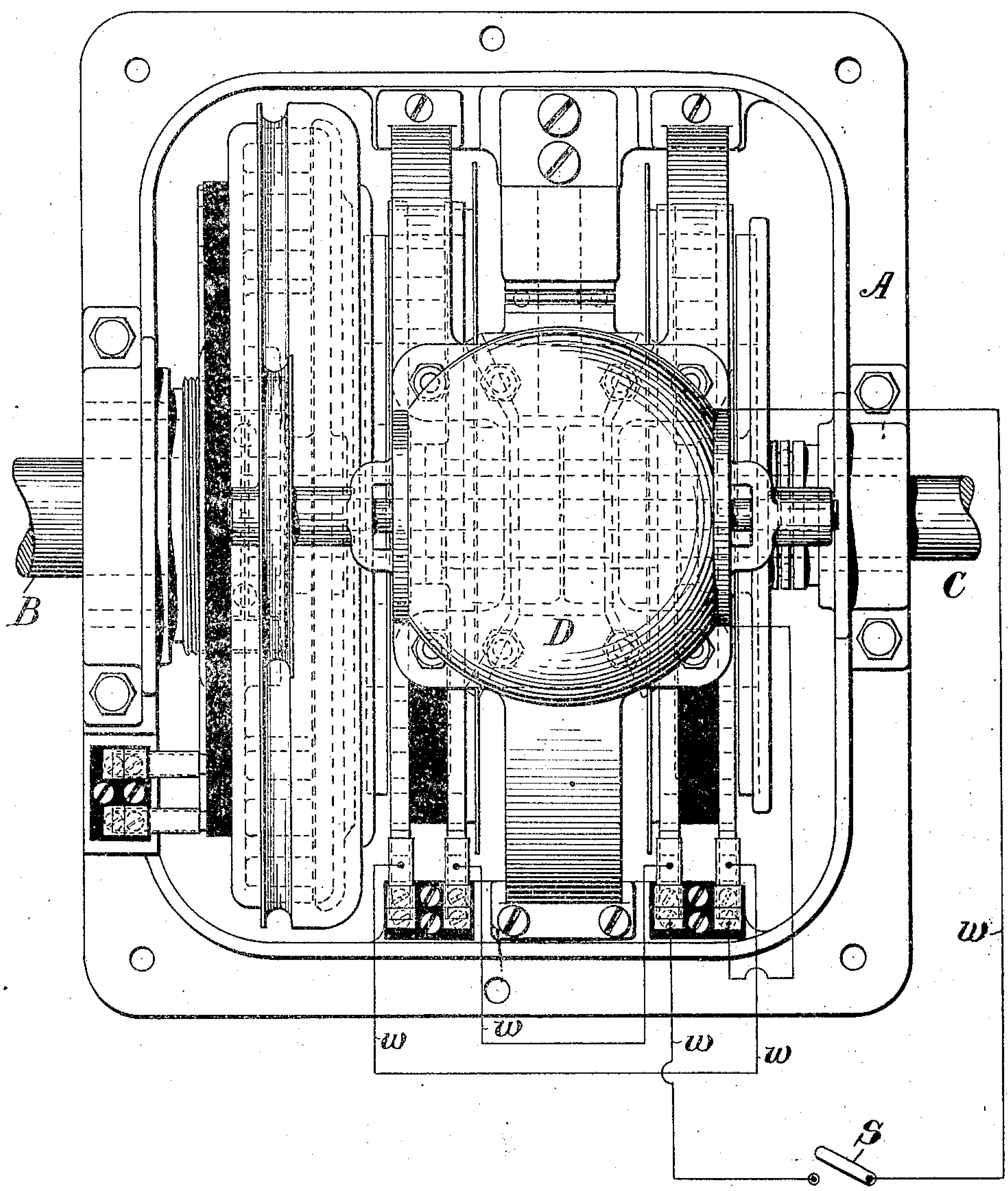
D. BACON.

MAGNETIC POWER CONTROL.

APPLICATION FILED JAN. 28, 1905.

2 SHEETS—SHEET 1.

Fig. 1.




Witnesses
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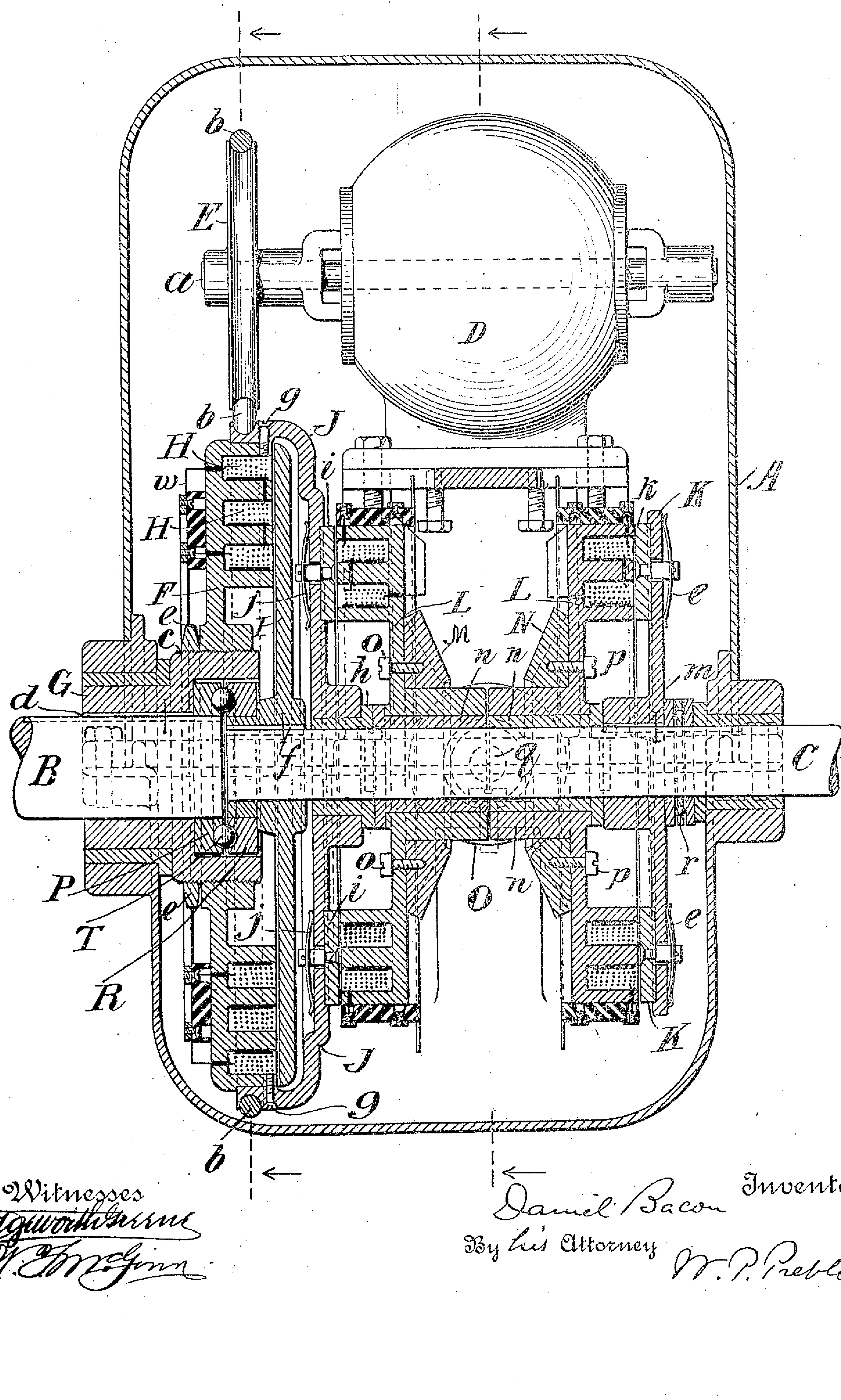
2 SHEETS—SHEET 2.

Fig. 2.

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# UNITED STATES PATENT OFFICE.

DANIEL BACON, OF BROOKLYN, NEW YORK, ASSIGNOR TO MAGNETIC CONTROL COMPANY, OF NEW YORK, N. Y.

## MAGNETIC POWER CONTROL.

No. 834,355. Specification of Letters Patent. Patented Oct. 30, 1906.

Application filed January 28, 1905. Serial No. 242,997.

*To all whom it may concern:*

Be it known that I, DANIEL BACON, a citizen of the United States, and a resident of Brooklyn borough, county of Kings, and State of New York, have invented certain new and useful Improvements in Magnetic Power Control, of which the following is a specification.

My invention relates to that class of mechanism by which power is received from an outside source and transmitted under magnetic control to a driven mechanism. Such apparatus is commonly called a "transmitting" mechanism, and the passage of power through said mechanism is usually effected by the action of an electromagnet on a suitable armature. The object of my invention is to reduce heat and wear between the magnet and armature by eliminating whatever percentage of pressure there is normally in a so-called "magnetic" clutch, and also to effect variations, as desired, in the percentage of power transmitted to the driven mechanism. To accomplish this object, I interpose an adjusting-bearing, preferably of the ball-bearing type, between the magnets and armature, whereby the relations of the armature and magnet with each other can be adjusted and controlled with great delicacy and accuracy to conform to the character of the work desired on the part of the driven mechanism.

One application of my invention is shown in the accompanying drawings, in which—

Figure 1 is a top plan, the top of the casing being removed. Fig. 2 is a vertical section.

Same letters indicate similar parts in the different drawings.

A is a hollow shell or casing which contains the motor and transmitting mechanism and protects them from dust and other outside interference.

B is the main driving-shaft, which in the case of marine propulsion may be the engine-shaft, and through this shaft power is derived from a source not shown.

C is the transmitting-shaft, or it may be the shaft of the driven mechanism, and in the case of marine propulsion it would preferably be the propeller-shaft.

D is an electric generator mounted upon the shaft *a* and mounted upon any desired fixed support within the shell A. This electric motor is intended to supply the necessary electric energy for the operation of the device, but forms no part of my invention, as other modes of supplying the needed electric current may be used, if desired. It is driven by means of the belt *b*, which passes over the pulley E, on shaft *a*, from the shaft B, as hereinafter explained.

F is a magnet-disk which is adjustably mounted on the sleeve G, the exterior of which is screw-threaded, as shown at *c*. The sleeve G is splined to the shaft B by the spline *d*, so as to permit of motion lengthwise of the shaft for adjusting purposes, and the position of the magnet-disk on said sleeve is determined by turning the disk to the right or left, so that it is fed in one direction or the other by the interlocking screw-thread and when adjusted it is held steady by the nut *e*. This magnet-disk carries electromagnets H of any suitable construction, which are energized by suitable wiring *w* from the generator D.

It will be seen that the magnet-disk revolves with the shaft B, and therefore is always in motion when the shaft B rotates. I is an armature splined to the shaft C by the spline *f*, which permits a longitudinal slip, and this armature is picked up and rotated by the magnet-disk H whenever the magnet-disk thereon are energized and is released when the magnets are demagnetized. It is obvious, therefore, that motion will be communicated to the shaft C in the same direction as that of the shaft B whenever the magnets H are energized, and the object of my invention is to regulate and control the percentage of force thus transmitted from the shaft B to the shaft C, which I accomplish by a mechanism hereinafter described.

To transmit motion to the shaft C in an opposite direction to that of the shaft B, I employ a system of beveled gearing, and to do this is a second object of my invention.

Secured to the magnet-disk H by the screws *g g* is a frame *j*, provided with a hub *h*, which turns loosely around the shaft C. This frame carries an armature plate or ring *i*, yieldingly secured thereto by the springs *j j*. Another plate K, carrying the armature-ring *k*, yieldingly secured to it by the springs *l l*, is splined to the shaft C by the spline *m*. It is therefore obvious that the frame J revolves without turning the shaft C, while the plate K cannot revolve without turning the shaft with it.

Motion is transmitted from the frame *j* to the plate K as follows: The shaft C carries two loose sleeves *n n*, on which are mounted the magnet-disks L L, in such position as to present their magnets to the face of the armature-rings *i* and *k*, respectively. When, therefore, these magnets are energized, which they are simultaneously, they pick up the armature-rings, thus receiving power from the shaft B and transmitting it to the shaft C by means of the intervening beveled gears M, N, and O. The beveled gears M and N are fastened to the magnet-disks L L by screws *o o* and *p p*, respectively, while the intermediate beveled gear O meshes with the gears M and N and is mounted upon the shaft *q*, journaled in the framework of the apparatus. It will thus be seen that the revolution of the gear N is the reverse of that of the gear M, and therefore whenever the magnets on the disks L L are energized the shaft C is caused to revolve in a direction opposed to that of the shaft B.

Ball-bearings *r* are provided for the face of the hub of the plate K, so that the tendency of said plate to slip lengthwise of the shaft C is controlled without too much friction.

S is a switch by which the operator turns the electric power of the generator D into the proper direction to energize the magnets on the disk H or those on the plates L L, according to the direction in which he desires the shaft C to turn. The method of wiring *w w* will, I think, be readily understood without detailed description.

In order to control the pressure by which the armature I, which is used when direct revolution is to be transmitted, is drawn toward the disk H and the distance to which said armature is allowed to approach said disk, I provide the loose rings P and R, set on the shafts B and C, respectively, and separate them by ball-bearings T. The normal distance between the rings P R having been determined for a desired pressure or magnetic pull of the armature I and disk H, the disk H is adjusted in the collar G for that distance and secured by the nut *e*. The tendency, therefore, of the splined armature I to approach the disk H is taken up by the balls T, and this means of adjustment can be made as delicate as desired. The contact between the armature I and disk H may in this way be entirely eliminated by what may be called a "magnetic" but not a physical contact, or varying degrees of physical contact may be permitted, as desired.

I claim—

1. A magnetic power control, which consists of electromagnets carried by a suitable shaft, and means for energizing said magnets when required, an armature operating within the field of said magnets and mechanism operated by said armature, and adjustable rings interposed between said magnets and said armature, whereby both the electromagnetic power coefficient and the mechanical power coefficient can be regulated as desired.

2. A magnetic power control which consists of an electromagnet and armature operated thereby to produce direct revolution of a driving-shaft, with means for adjusting and energizing said magnet and armature; a pair of revolving electromagnets and their armatures, and a system of beveled gearing connecting said pair of magnets whereby the armatures operated thereby are caused to impart a reverse revolution to said driving-shaft, and the mechanism driven thereby.

DANIEL BACON.

Witnesses:

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