No. 688,670. Patented Dec. 10, 1901.

J. McGEORGE.

MAGNETIC FRICTION BRAKE.

(Application filed May 9, 1901.)

(No Model.)

Fig. 1.

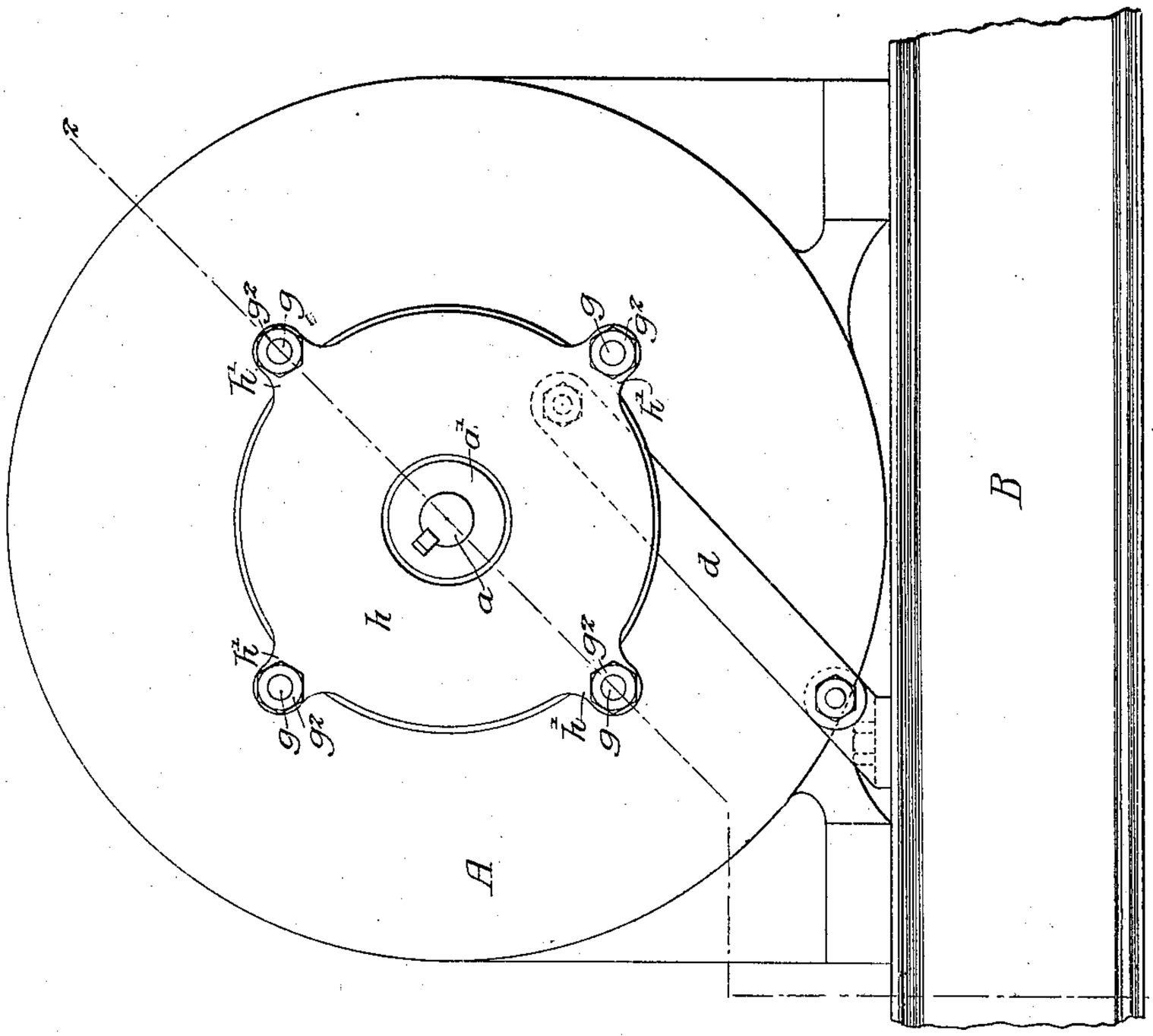
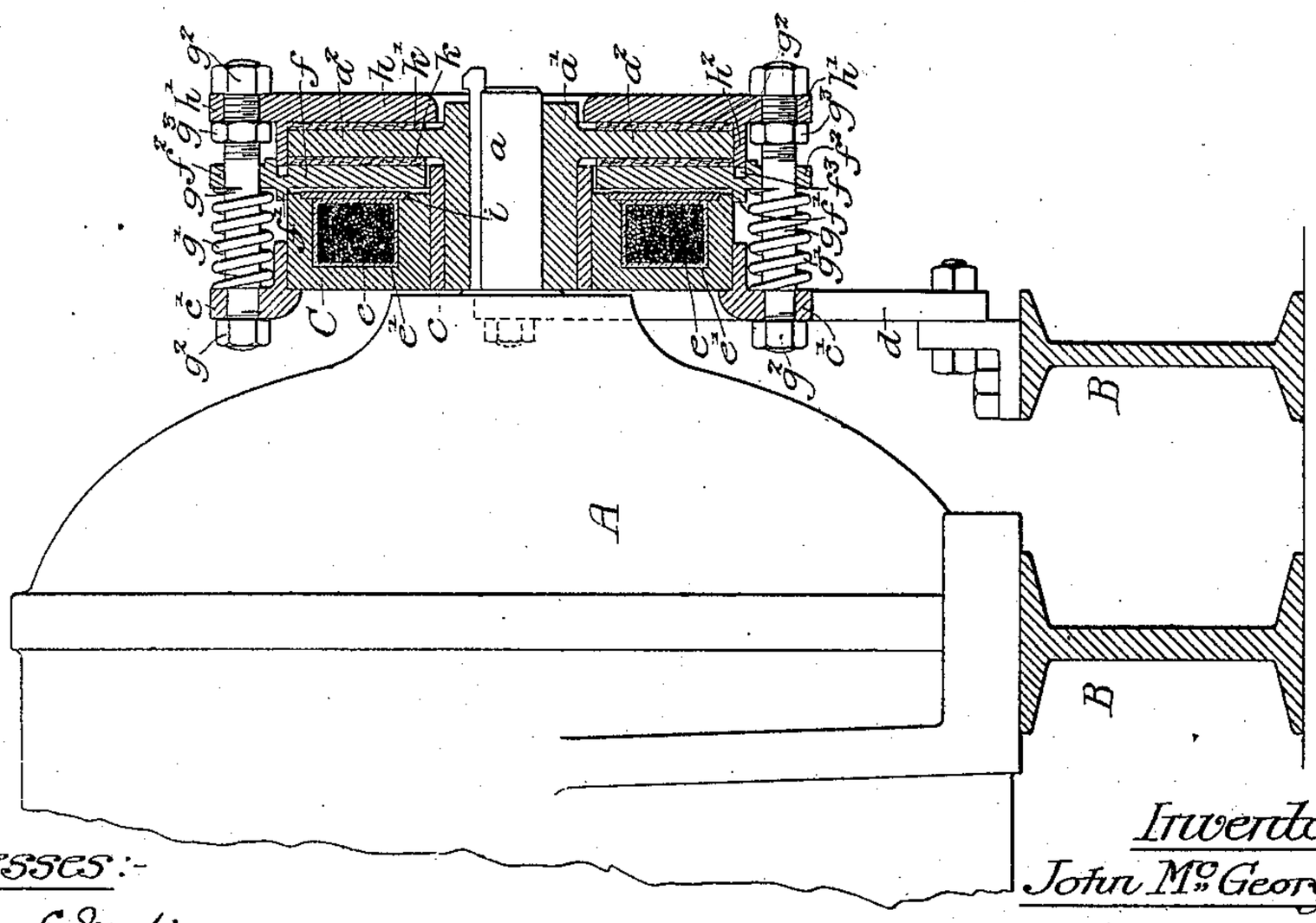


Fig. 2.



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JOHN McGEORGE, OF CLEVELAND, OHIO, ASSIGNOR TO THE ELECTRIC CONTROLLER AND SUPPLY COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

MAGNETIC FRICTION-BRAKE.

SPECIFICATION forming part of Letters Patent No. 688,670, dated December 10, 1901.

Application filed May 9, 1901. Serial No. 59,459. (No model.)

To all whom it may concern:

Be it known that I, JOHN McGEORGE, a citizen of the United States, and a resident of Cleveland, Ohio, have invented certain Improvements in Magnetic Friction-Brakes, of which the following is a specification.

My invention relates to certain improvements in brake mechanism, and more particularly to improvements in that class of brakes in which the brake-shoe or its equivalent is held out of engagement with a bearing-surface by a force exerted against the action of a spring.

The object of my invention is to provide a device for preventing or retarding the revolution of a shaft which shall be practically self-contained, easily applied to a shaft, and which shall accommodate itself to any wear of the shaft-bearings. This object I attain as hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is an end view of my improved brake, showing it as applied to the armature-shaft of an electric motor and indicating one way of attaching it to a fixed support; and Fig. 2 is a sectional view of the brake, showing its detail construction.

In the drawings, A is the frame or casing of an electric motor supported in any suitable manner—in the present instance on I-beams B B. One end of the armature-shaft *a* projects beyond the motor-casing, as shown, and has keyed to it a bushing or shell *a'*, having a disk-section a^2, which in the mechanism shown is formed integral with it. A hollow ring-shaped piece C of iron or steel, having a brass bearing-sleeve *c* forced into it, is supported thereby on the bushing *a'*. The bushing *a'* is free to move independently of the piece C, which is kept from rotating by a link *d*, bolted to it and attached to a suitable fixed support—as, for example, to one of the motor-supporting beams or to the motor-frame itself.

Lugs *c' c'* are cast integral with or bolted onto the edge of the piece C for a purpose hereinafter set forth.

The piece C forms the frame and the pole-pieces of a magnet with the coil *e* wound within it, there being preferably a lining of non-conducting material *e'* in the hollow of said piece or frame C for the better insulation of the wire of the magnet.

Between the magnet-frame C and the disk a^2 is a flat ring *f* of iron having a flange *f'*, which bears upon the edge of the frame, and lugs f^2 f^2, through which pass bolts *g g*. These bolts pass through lugs *c' c'* of the magnet C, having nuts g^2 and confining-springs *g' g'* between the said lugs *c'* and the lugs f^2. On the outer side of the disk a^2 is a second flat ring *h*, provided with lugs *h' h'*, the bolts *g* passing through these and being held rigidly thereto by jam-nuts g^3 g^3. There is a circular flange h^2 on the inside face of the ring *h*, which projects over and bears upon the outside edge of the disk a^2, also extending beyond this disk and entering a groove or recess f^3 in the ring *f*.

A flat brass ring *i* is set in the face of the magnet-frame C nearest the ring *f* and is allowed to project slightly beyond said face to prevent any possible sticking together of said ring and the magnet-frame. Disks *k k'*, of brass, bronze, fiber, or other material suitable for brake-shoes, are provided between the disk a^2 and each of the rings *f* and *h*.

In operation the magnet *e* is energized from a suitable source of current, in the present instance being intended to be used in series with the motor to which the brake is attached, and strongly attracts to it the ring *f*, compressing the springs *g'*. This condition allows the disk a^2 to move freely between the two rings *f* and *h*, and there is no retarding influence exerted on the shaft *a*. As soon, however, as the current to the motor is broken the magnet *e* is immediately deënergized and as a consequence releases the ring *f*. Under the action of the springs *g' g'* this presses one of the rings or disks *k* against one side of the disk a^2, and the reaction from this pressure causes the ring *h* to press its ring or disk *k'* against the other face of the disk, both rings acting as brake-shoes, tending to retard its rotation and very quickly bringing the shaft to rest. The link *d* holds the magnet-frame C from rotating with the armature-

shaft when the brake is applied, it being made jointed, as shown, so as to allow for settlement of the shaft in its bearings as the said bearings wear. Thus it will be seen that the brake is automatic in action, being thrown into operation by the cutting off of the electric current to the motor and holding the shaft of said motor motionless until the current is again turned on.

It will be understood by those skilled in the art that the above-described brake is not necessarily applied to the armature-shaft of an electric motor, as it may with equal advantage be used to stop any shaft and may be operated by current from any suitable source of supply.

I claim as my invention—

1. The combination of a rotatable shaft, a piece fixed thereto and rotating with the shaft, said piece being provided with a braking-surface in a plane at right angles to the shaft, a non-rotatable magnet having a frame, an armature for said magnet, springs acting between the periphery of the magnet-frame and the armature, said springs being constructed to force the said armature against the braking-surface of the piece fixed to the shaft, substantially as described.

2. The combination of a shaft, a disk keyed thereto, a magnet loosely supported on the shaft, having means to prevent it from rotating, non-rotatable armature for the magnet and springs acting to force the said armature against the disk, substantially as described.

3. The combination of a shaft having a disk keyed to it, a magnet supported loosely on the shaft, with means to prevent it from rotating with the shaft, non-rotatable armature for the magnet, means for forcing said armature against the disk on the shaft, said armature being constructed to be drawn away from said disk when an electric current is sent through the magnet, substantially as described.

4. The combination of a shaft having a disk keyed to it, a magnet loosely supported on said shaft, having means to prevent it from rotating, non-rotatable armature placed between the magnet and the disk and springs constructed to force said armature against the disk, substantially as described.

5. The combination of a shaft having a disk keyed to it, a magnet having a frame loosely supported on the shaft and prevented from rotating therewith, a ring-shaped armature encircling the shaft and situated between the magnet and the disk, bolts connecting the armature and the magnet-frame and springs on said bolts, substantially as described.

6. The combination of a shaft having a disk fixed to it, a magnet having a frame loosely bearing upon the shaft, means for preventing rotation of said frame, an armature for the magnet between it and the disk constructed to be pressed against one side of said disk and to act as a brake-shoe thereon, a second piece constructed to act on the other side of the disk, with means for throwing the said piece and the armature into operation, substantially as described.

7. In a brake mechanism, the combination of a shaft having a disk fixed to it, brake-shoes, a spring acting thereon, and a magnet normally holding said shoes out of engagement with said disk against the action of the spring, the magnet and the brake-shoes being loosely and non-rotatably supported on the shaft and having a link suitably anchored whereby they are prevented from rotating, substantially as described.

8. The combination in a braking mechanism for a shaft, of a disk, a ring on each side of and parallel to the same, a magnet having a frame and constructed to act on one of the rings, bolts connecting the said rings and the magnet-frame, and means for pressing the rings against the disk when the magnet is de-energized, substantially as described.

9. The combination in a braking mechanism, of a disk, a ring on each side of and parallel to the same, a magnet constructed to act on one of the rings, springs pressing one of the rings away from the magnet and tending to force both rings toward the disk, substantially as described.

10. The combination of a shaft, a bushing carrying a disk keyed thereto, a magnet loosely supported on said bushing, means for preventing rotation of the magnet, an armature for the magnet between said magnet and the disk, means for loosely connecting the magnet and its armature, and springs tending to force said armature away from the magnet and toward the disk, substantially as described.

11. The combination of a shaft, a bushing carrying a disk keyed thereto, a magnet loosely supported on the bushing, means for preventing rotation of the magnet when the shaft is rotated, a ring constructed to bear upon one face of the disk and acting as an armature to the magnet, a second ring constructed to bear against the other face of the disk and having a flange bearing upon the edge of said disk, with means for pressing said rings against the disk when the magnet is deënergized, substantially as described.

12. The combination of a shaft, a disk fixed thereto, a metallic ring on each side of said disk, springs constructed to press said rings toward the disk, a magnet constructed to cause said rings to move away from the disk against the springs, means connecting the rings and the magnet, means for anchoring the magnet, and material between the rings and the disk, constructed to increase the friction between them, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN McGEORGE.

Witnesses:
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