No. 798,580. PATENTED AUG. 29, 1905.

G. W. GILMORE.

MAGNETIC BRAKE.

APPLICATION FILED NOV. 23, 1904.

2 SHEETS—SHEET 1.

Fig. 2.

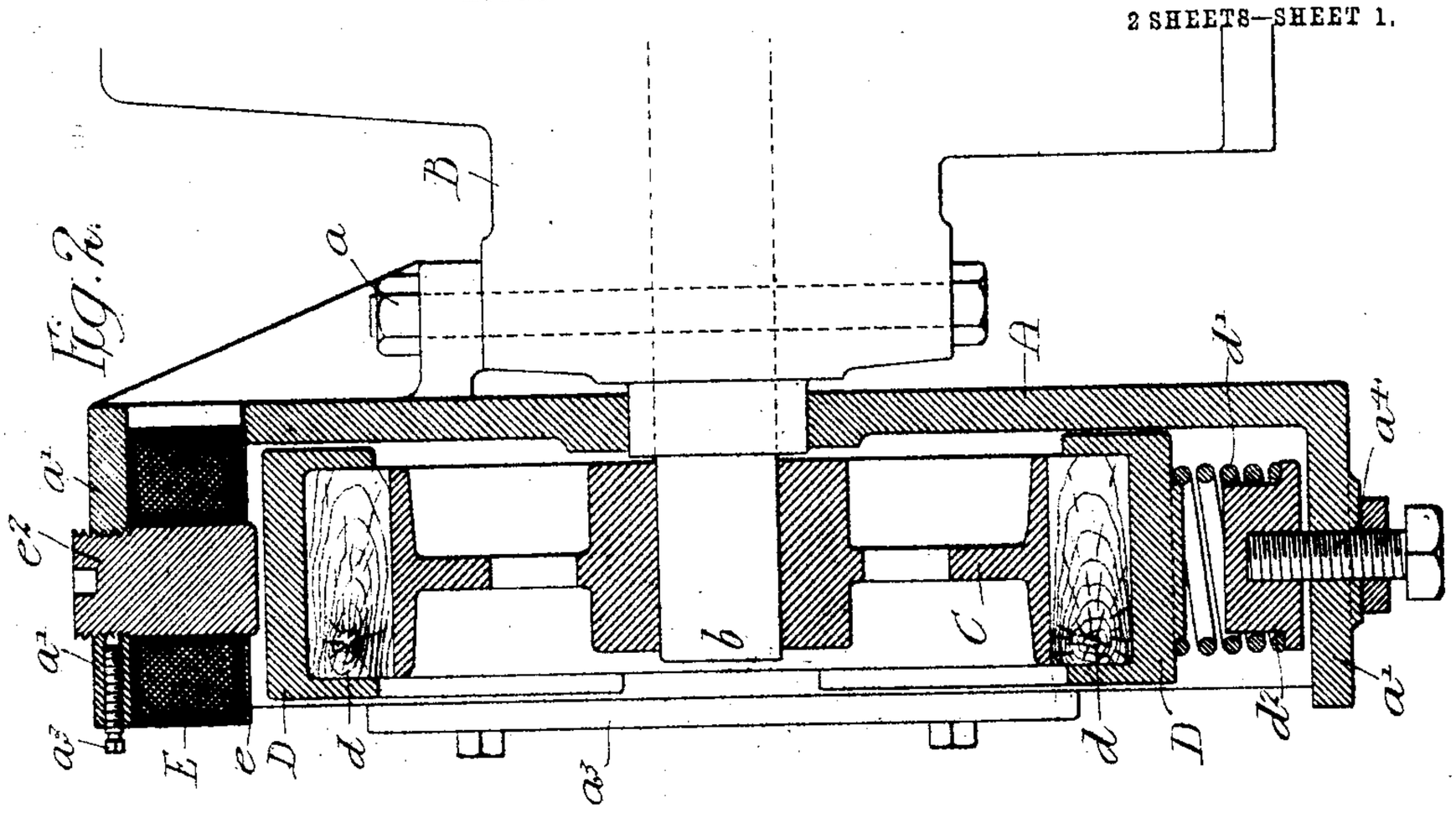
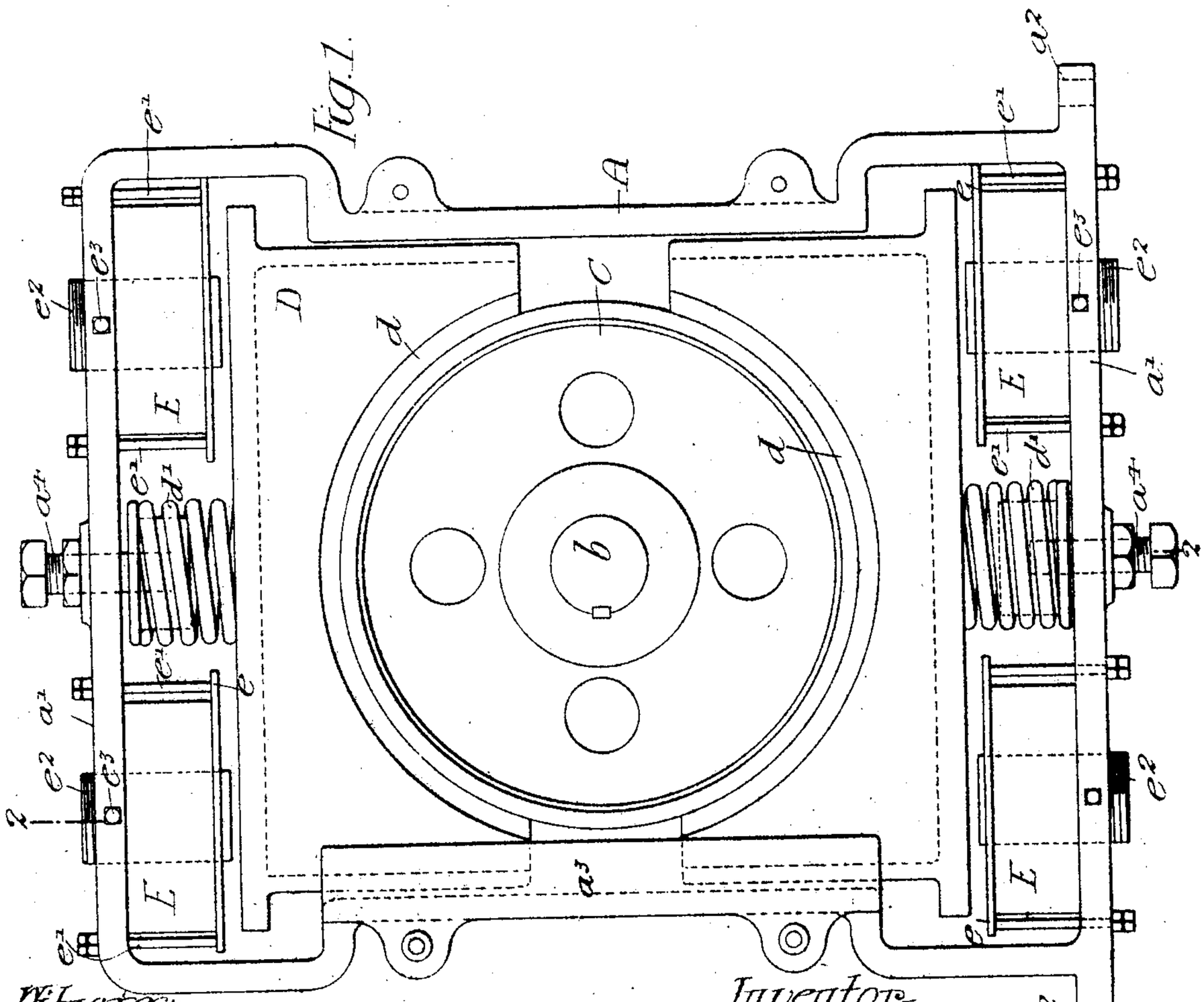


Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 3.

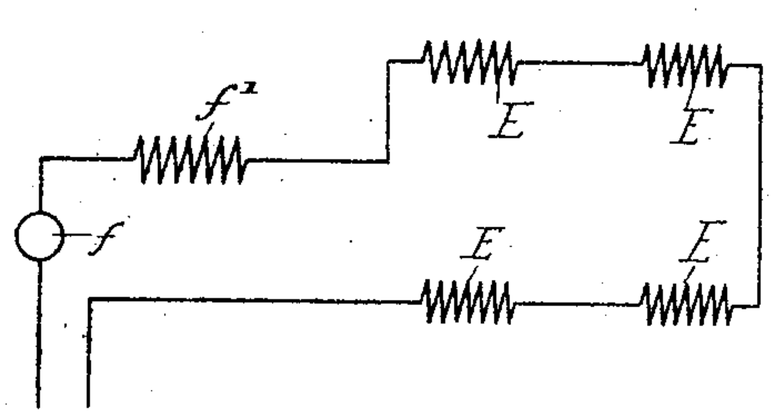


Fig. 4.

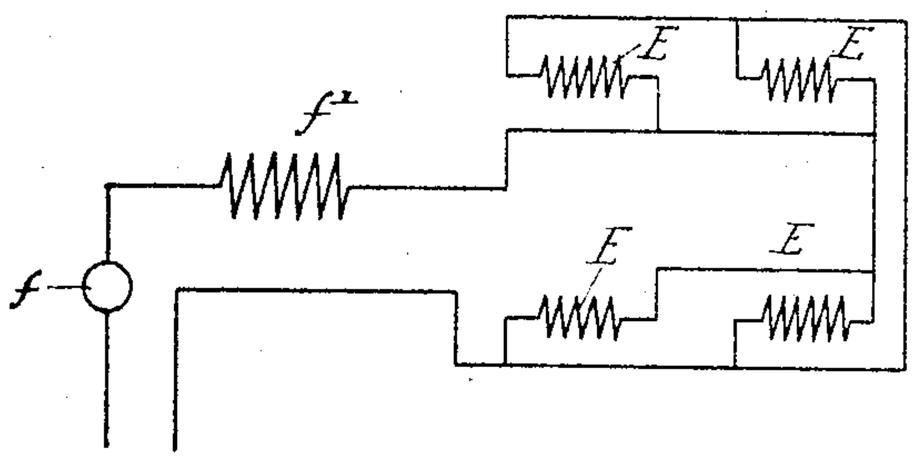
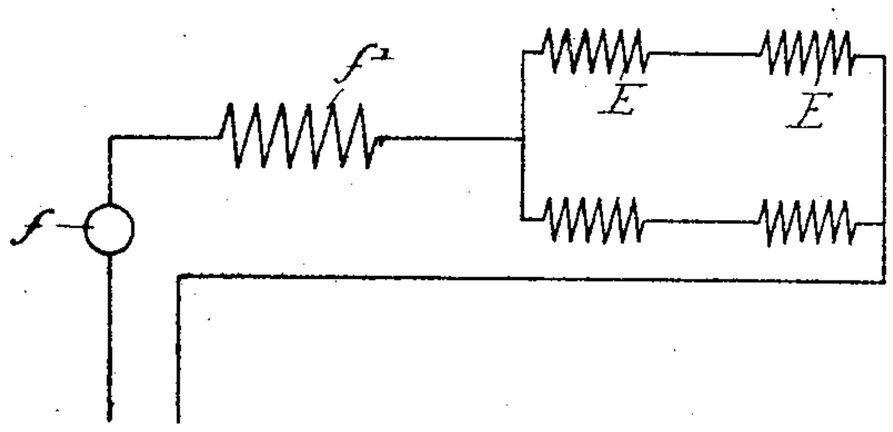


Fig. 5.



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UNITED STATES PATENT OFFICE.

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MAGNETIC BRAKE.

No. 798,580. Specification of Letters Patent. Patented Aug. 29, 1905.

Application filed November 23, 1904. Serial No. 234,017.

To all whom it may concern:

Be it known that I, GEORGE W. GILMORE, a citizen of the United States, residing in Alliance, Ohio, have invented certain Improvements in Magnetic Brakes, of which the following is a specification.

One object of my invention is to provide a braking device of relatively simple construction which shall include a brake wheel and shoes normally held out of engagement with the same by means of magnets, it being particularly desired that the device shall be of such construction as will permit of the convenient connection of its electrical apparatus for operation at different voltages, as well as render it possible to adjust the device for different capacities.

It is further desired to provide a braking device of the character noted in which the magnet-cores shall be conveniently adjustable in order to follow up the brake-shoes as these wear, thereby preventing such wear from affecting the operation of the brake.

I also desire to provide a magnetic brake having such an arrangement of parts that in the event of the spring of one of the brake-shoes becoming inactive through breakage the remaining shoe or shoes shall be available for operation as soon as the magnets are deënergized.

These objects I attain as hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of my improved magnetic brake, illustrating the relative arrangement of the various parts and having one of the shoe-guiding plates removed for the sake of clearness. Fig. 2 is a sectional elevation taken on the line 2 2, Fig. 1; and Figs. 3, 4, and 5 are diagrammatic views illustrating various arrangements of the connections of the magnets, the brake, and the electric motor with which such a brake is customarily used.

In the above drawings, A is the frame of the brake, preferably connected to and supported on the journal-bushing B by means of bolts, of which one is shown at a. As indicated in Fig. 2, the frame preferably consists of a flat plate having forwardly-projecting flanged portions a' and provided at its lower portion with outwardly-projecting lugs a^2, by means of which it may be bolted to any suitable foundation, if desired. The brake-wheel C is keyed to the armature-shaft b of the motor and has bearing upon its surface two wooden blocks d, belonging to the brake-shoes D. These shoes are held in place in the frame by means of guide-plates, of which one is indicated at a^3, and are normally pressed against the surface of the wheel C by means of springs d', respectively confined between the shoe d and a bushing d^2, adjustably held to the flanged portion a' of the frame A by a bolt a^4. By suitable manipulation of these bolts the amount of pressure exerted by the shoes D upon the brake-wheel C may be varied.

Between each of the shoes D and the flanged portion of the frame A are two magnets E, preferably of a construction similar to that of the field-magnets of an ordinary street-car motor and held in position in said frame by means of plates e, clamped to said frame by bolts e'. The cores e^2 of the magnets are threaded where they pass through the flanged portion a' of the frame, so as to permit of their being moved toward or from the brake-shoe D, there being a set-screw e^3 provided for each of said cores, whereby it may be retained in any adjusted position.

Under operating conditions the four magnets E may be connected in series, as shown in Fig. 3, in multiple, as shown in Fig. 4, or two in series and two in multiple, as shown in Fig. 5, in any case, however, being as a whole connected in series with a motor (having an armature f and field-winding f') to which the brake is attached. With such an arrangement of parts it will be noted that as long as the motor is inactive the springs d' hold the shoes D against the brake-wheel C, thereby preventing any revolution of the armature-shaft. As soon, however, as current is supplied to the motor the magnets E are necessarily energized, being thereby caused to attract their respective brake-shoes and hold them out of engagement with the brake-wheel against the action of the springs d'. When, however, current is cut off from the motor, the magnets are deënergized and said springs again cause the shoes to engage the brake-wheel, thereby quickly bringing the armature to a standstill. As the wooden parts d of the brake-shoes wear so as to increase the air-gap between their cores e^2 and those metallic por-

tions of the said shoes included in the magnetic circuits of the various windings E said cores may be made to follow up the shoes by slacking off the set-screws e^3 and adjusting the cores by screwing them through the flanged portion of the frame until such air-gap is brought to the proper dimension.

When it is desired to renew the parts d, forming the bearing portions of the shoes D, the guide-plates a^3 are removed, thereby permitting said shoes to be drawn outwardly in a line parallel with the armature-shaft. It will be seen that should one of the springs d' fail to do its duty by reason of breakage the other spring is still available for work, and that independently of the remaining spring or springs.

I claim as my invention—

1. A braking device including a wheel, a shoe placed to bear thereon and movable toward and from the axis of revolution of said wheel, a magnet for operating said shoe and including in its magnetic circuit a portion of the shoe structure, with an adjustable core for the magnet, substantially as described.

2. A braking device including a wheel, a shoe placed to act thereon and movable toward and from the axis of revolution thereof, means acting to force the shoe toward the wheel, a magnet placed to draw the shoe away from said wheel, with means for adjusting the air-gap between the magnet and the shoe as said shoe wears, substantially as described.

3. The combination of a frame, a wheel adjacent thereto, a shoe operative on the wheel, a spring confined between the frame and the shoe, and a magnet operative upon the shoe, the core of the magnet being adjustable in the frame toward and from the shoe, substantially as described.

4. The combination of a frame, a wheel adjacent thereto, a shoe operative upon the wheel and movable in guides on the frame toward and from the axis of revolution of said wheel, a spring and a magnet operative on the shoe, one of the members comprised by the spring and the magnet tending to move said shoe into engagement with the wheel and the other acting in opposition to such tendency, substantially as described.

5. A braking device including a structure having a braking-surface, a frame, a shoe movable in said frame and so placed as to engage the braking structure by movement toward the axis of revolution thereof, a spring tending to force together said shoe and the braking structure, and a magnet on each side of said spring placed to move the shoe away from the braking structure, substantially as described.

6. A braking device including a brake-wheel, a frame, a shoe movable toward and from the axis of revolution of the wheel, with a guide on the frame including a removable plate for maintaining the shoe in operative position, a spring extending between a portion of the frame and the shoe, and a magnet placed to act upon the shoe in opposition to the spring, substantially as described.

7. A braking device including a brake-wheel, with a frame extending around the same, a plurality of brake-shoes guided in the frame and movable in opposite directions to engage the brake-wheel, a spring for each shoe, and a magnet or magnets operative upon each shoe and placed to act in opposition to the spring thereof, substantially as described.

8. The combination of a frame, a braking-wheel, a shoe guided in said frame so as to be movable toward and from the axis of revolution of the braking-wheel, a spring for forcing the shoe against said braking-wheel, and a device for varying the pressure of said spring upon the braking-wheel, with a magnet acting in opposition to said spring, substantially as described.

9. The combination of a frame, a braking structure, a shoe operative thereon, a spring operative on the shoe, and a magnet placed to act in opposition to the spring, the core of the magnet being threaded into the frame, whereby the distance between said core and the shoe may be adjusted, substantially as described.

10. The combination of a braking structure, a frame surrounding the same, two oppositely-placed shoes in the frame acting upon said structure, a spring active upon each of the shoes to force the same toward the braking structure, with two magnets for each shoe placed to act in opposition to said spring, substantially as described.

11. The combination of a braking structure, a frame, a shoe guided in the frame and operative upon said structure, a spring and a magnet operative upon the shoe, a portion of said shoe being included in the magnetic circuit of said magnet, with means for adjusting the position of the core of said magnet relatively to the frame and the shoe to compensate for the wear of the shoe, substantially as described.

12. The combination of a motor-shaft with a braking device, said device including a frame fixed to a stationary portion of the motor, a wheel fixed to the armature-shaft of the motor, a magnet or magnets carried by the frame, a shoe or shoes guided in the frame and movable toward and from the axis of revolution of the wheel, means tending to force the shoe or shoes into engagement with the wheel, with means for adjusting the air-gaps in the magnetic circuits of the magnets to compensate for the wear of the shoes, substantially as described.

13. The combination of a structure having a braking-surface, a frame, two oppositely-placed shoes constructed to act upon said brak-

ing-surface, and provided with guideways on the frame a spring or springs for the shoes placed to force them toward the braking structure, with a magnet or magnets placed to act in opposition to the spring or springs, substantially as described.

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

GEORGE W. GILMORE.

Witnesses:
G. W. SHEM,
J. J. BROWN.