

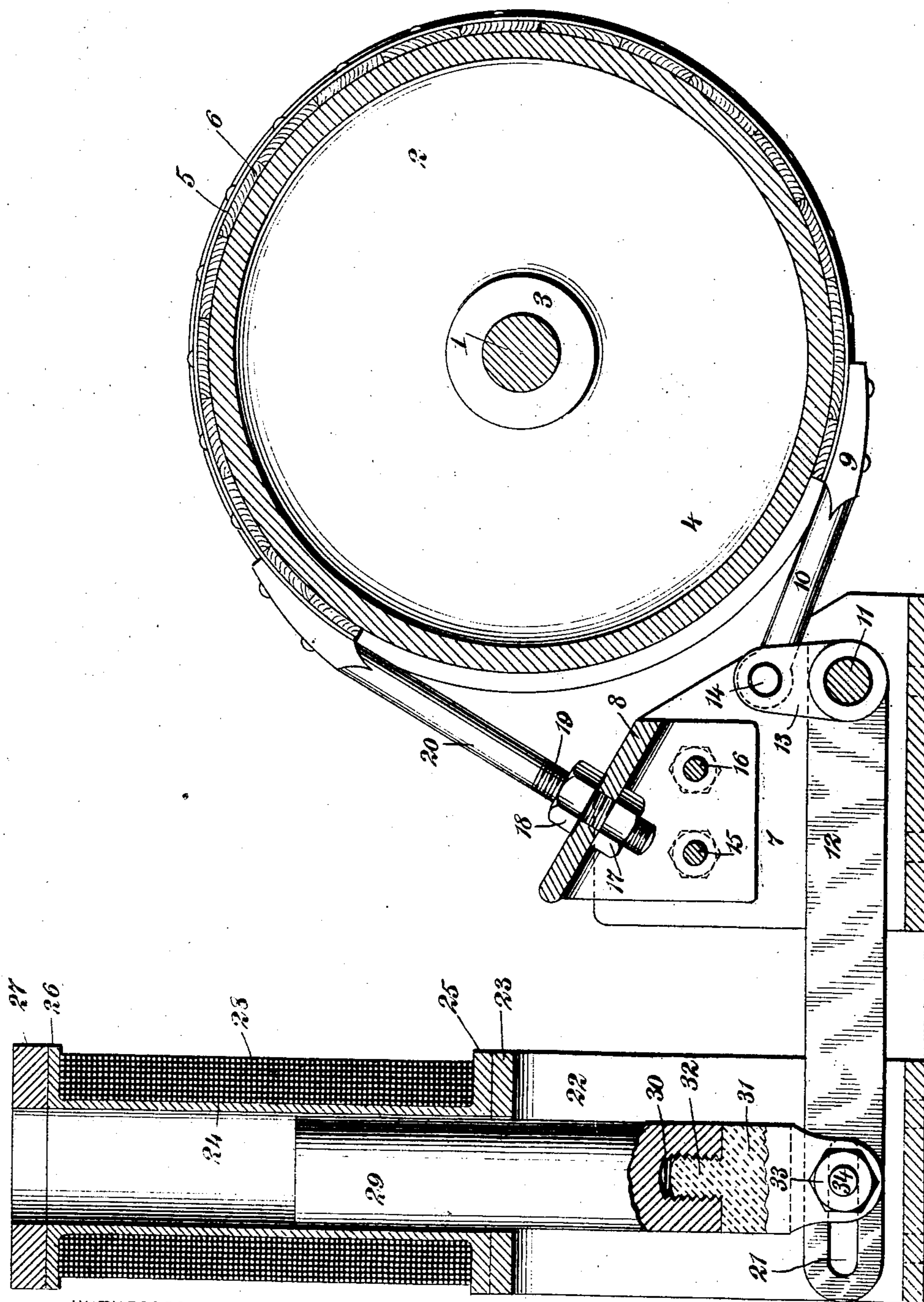
No. 765,032.

PATENTED JULY 12, 1904.

J. F. MOTZ.
MAGNETIC BRAKE.

APPLICATION FILED MAY 28, 1902.

NO MODEL.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JACOB FRANCIS MOTZ, OF PHOENIXVILLE, PENNSYLVANIA.

MAGNETIC BRAKE.

SPECIFICATION forming part of Letters Patent No. 765,032, dated July 12, 1904.

Application filed May 28, 1902. Serial No. 109,399. (No model.)

To all whom it may concern:

Be it known that I, JACOB FRANCIS MOTZ, a citizen of the United States, and a resident of Phoenixville, in the county of Chester and State of Pennsylvania, have invented new and useful Improvements in Magnetic Brakes, of which the following is a full, clear, and exact description.

My invention relates to magnetic brakes, and more especially to the type of magnet used therein.

My object more particularly is to provide a brake in which the magnet will hold the armature when the mechanism is subjected to light loads, and especially when a series-wound magnet is used.

Reference is to be had to the accompanying drawing, forming a part of this specification, in which the figure represents my device partly in section.

Upon a revoluble shaft 1 is mounted a brake-wheel 2, provided with a hub 3 and a drum 4 in the usual manner. The brake-band is shown at 5 and may be provided with a number of sector-shoes 6. A bracket 7 is provided for the purpose of supporting certain movable parts.

A strap-link 10 is provided with a head 9, secured upon the brake-strap. Connected with the rocking shaft 11 is a lever 12 and a crank 13, the lever, crank, and shaft together constituting a bell-crank, a crank-pin 14 connecting the link 10 and crank 13. Bolts 15 16 are used for the purpose of supporting a bridge 8 upon the bracket 7. Nuts 17 18 are screwed upon the thread 19 of the link 20, which is connected with the upper end of the brake-strap. These nuts 17 18 are merely for the purpose of adjusting the length of the strap. The so-called "free" end of the lever 12 is provided with a slot 21.

A pedestal 22 is provided with a plate 23, upon which rests the solenoid, consisting of the spool 24, provided with flanges 25 26 and surmounted by a ring 27, of magnetic material, such as soft steel or iron. The spool is provided with a wire 28, wound in the form of a cylindrical helix. A plunger consisting of the iron armature 29, provided with a threaded hole 30, is engaged by a head 31, of

non-metallic material, preferably brass, which head is provided with a threaded boss 32, engaging the threaded aperture 30. A bolt 34 through the slot 21 is provided with nuts 33 for purposes of adjustment.

The operation of my device is as follows: The solenoid being energized by sending the current through the coil 28, the armature 29 is drawn upward, and this action releases the brake. The soft-steel ring acts as a pole-piece and serves to localize the magnetic lines of force, thereby enabling the armature 29 to be held up by comparatively little expenditure of energy. The head 31, being of non-magnetic material, is not attracted by the solenoid. When, therefore, the plunger moves upward until the lower end of the iron member 29 is substantially flush with the lower end of the solenoid, the magnetism has no further tendency to raise the lever 12. In other words, between the lower end of the armature 29 and the lever 12 is an intervening space in which there is no magnetic material, so that when the armature 29 moves upward to a certain predetermined point the upward movement of the lever 12 is discontinued. This occurs before the lever makes contact with the plate 23 or any other solid part. It will be observed, therefore, that my device consists, primarily, of a mechanical brake actuated by a solenoid, the solenoid being provided with a soft-steel ring for localizing the lines of force and the armature being a composite structure made partly of magnetic material and partly of non-magnetic material, the purpose of the non-magnetic material being to limit the extent of movement of the armature. The brake is applied to the wheel by the weight of the plunger, due to the release of the armature 29 by the solenoid. Normally when the brake is not applied a current flows continuously through the solenoid.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A magnetic brake, comprising a mechanical brake provided with a lever, a longitudinal solenoid provided at one of its ends with a ring of magnetic material, and a solid armature formed of iron and brass, the iron portion being disposed within said solenoid

and normally free to move within the same and the brass portion loosely connected with said lever.

2. In a brake, the combination with a brake-
5 band, and a bell-crank lever having one member connected with the brake-band and provided with a slot in the end of its other member, of a solenoid mounted above the member
10 of the bell-crank lever having a slot, and a solid cylindrical armature having its upper end formed of magnetic material and its lower end of non-magnetic material, the upper end of the armature working in the solenoid and its lower end connected with the bell-crank
15 lever by a pin working in the slot of the same, as set forth.

3. In a brake, the combination with a brake-band having one end secured to a fixed sup-

port, and a bell-crank lever having one end connected with the other member of the brake- 20 band, of a support into which the other member of the lever projects, a solenoid mounted upon the support, and a solid cylindrical armature having its upper end formed of magnetic material and its lower end of non-mag- 25 netic material, the upper end of the armature working in the solenoid and its lower end loosely connected with the brake-lever.

In testimony whereof I have signed my name to this specification in the presence of two sub- 30 scribing witnesses.

JACOB FRANCIS MOTZ.

Witnesses:

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MARY E. WILSON.