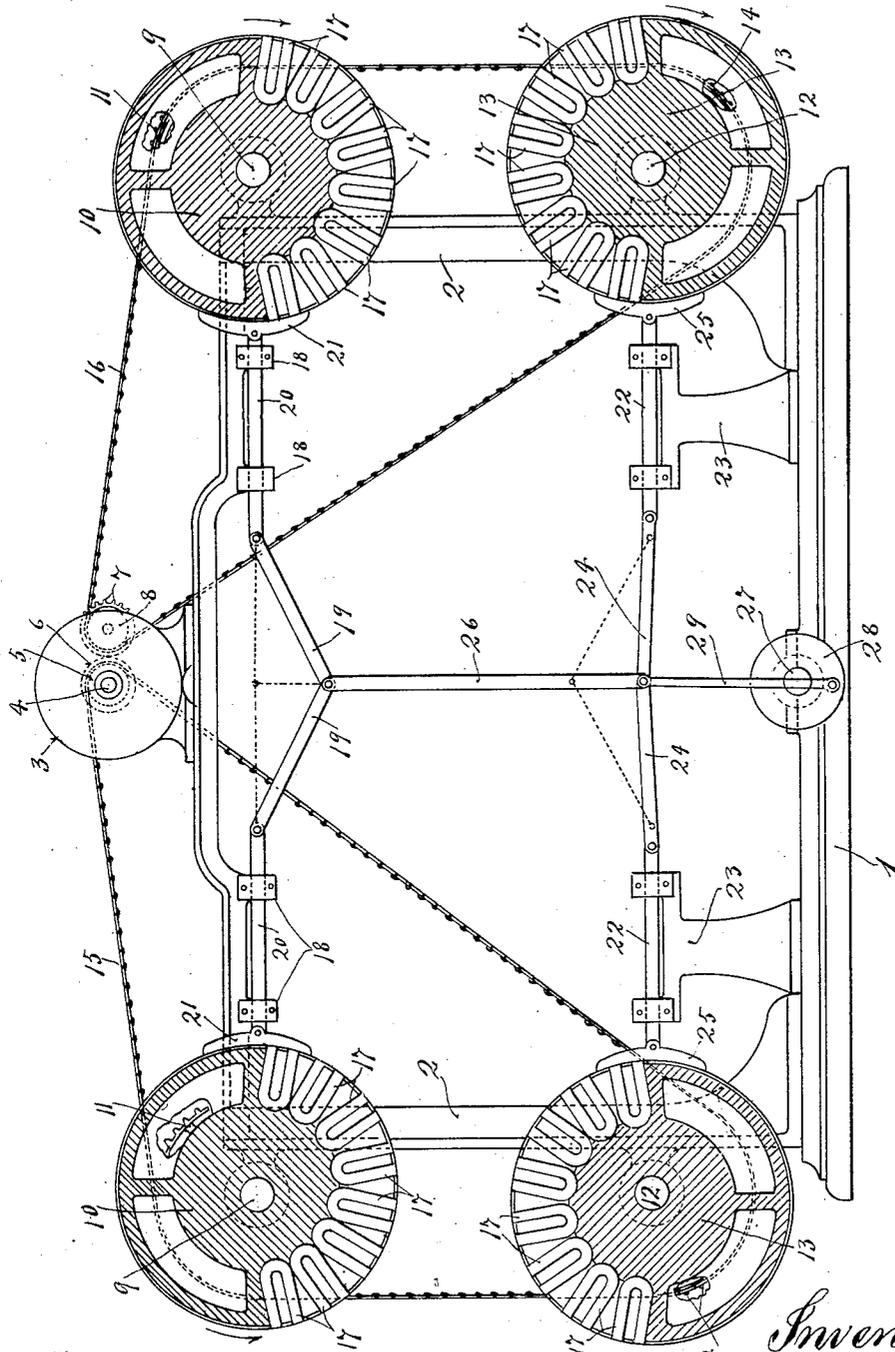


No. 748,182.

PATENTED DEC. 29, 1903.

F. HACHMANN.
MAGNETIC POWER MECHANISM.
APPLICATION FILED MAY 8, 1903.

NO MODEL.



Witnesses.
A. B. Opsahl.
H. D. [Signature]

Inventor.
Frederick Hachmann.
By his Attorneys.
Williamson Merck

UNITED STATES PATENT OFFICE.

FREDERICK HACHMANN, OF ST. PAUL, MINNESOTA, ASSIGNOR OF THREE-FOURTHS TO E. R. WISWELL AND BENJAMIN F. SIMON, OF ST. PAUL, MINNESOTA, AND LUTHER H. STILES, OF REDWING, MINNESOTA.

MAGNETIC-POWER MECHANISM.

SPECIFICATION forming part of Letters Patent No. 748,182, dated December 29, 1903.

Application filed May 8, 1903. Serial No. 156,155. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK HACHMANN, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Magnetic - Power Mechanism; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention has for its object to provide an improved power device or transmission mechanism; and to this end it consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

My improved device I call a "magnetic-power mechanism."

The invention is illustrated in the accompanying drawing, wherein the single view is partly in section and partly in side elevation.

In the said drawing the numeral 1 indicates a suitable base, from which rises a rigid rectangular frame 2.

The numeral 3 indicates in diagram an electric motor, which, as shown, is superimposed on and rigidly secured to the frame 2 at its upper central portion. The armature-shaft 4 of the motor carries a sprocket-wheel 5 and a spur-gear 6, both of which parts are indicated by dotted lines in the drawing.

The gear 6 meshes with a similar gear 7, suitably mounted on the motor-case and having secured to it a sprocket 8 for a purpose which will hereinafter appear. Suitably mounted at each upper corner of the frame 2 is a short counter-shaft 9, to which is rigidly secured an eccentric drum 10 and a large sprocket 11.

Also suitably mounted on the frame 2 below the pair of shafts 9 is another pair of counter-shafts 12, each having rigidly secured to it an eccentric drum 13 and a large sprocket 14. A sprocket-chain 15 runs over the driving-sprocket 5 and over the left-hand sprockets 11 and 14, and a similar sprocket-chain 16 runs over the driving-sprocket 8 and over the right-hand sprockets 11 and 14. It will thus be seen that when the motor 3 is thrown into action the eccentric drums 10 and 13 will be

rotated. The eccentric drums are so set on their shafts that when the two upper drums project inward to their extreme throw the two lower drums will project outward to their extreme throw.

Magnets 17 are disposed radially within each drum throughout approximately a semi-circumference thereof. The segments of said drums containing the magnets are at one side of the line drawn to intersect the center of a particular drum and the axis of its shaft. Furthermore, the magnets of the upper and lower drums are so disposed that they will be thrown inward in alternate order—that is, the magnets of one of the drums at a given side of the machine will reach an extreme inward point just as the magnets of the other drum on the same side leave an extreme inward position. The purpose of this will presently appear. In the drawing the magnets 17 are permanent magnets; but in practice they may be either permanent magnets or electromagnets.

Mounted in suitable bearings 18 on the upper portion of the frame 2 and connected for reverse movements by a toggle 19 is a pair of plungers 20, provided at their inner ends with pivoted segmental armatures 21, which closely engage the peripheral surfaces of the upper drums 10. Similar plungers 22 are mounted in bearings 23 on the base 1 and are connected for reverse movements by a toggle 24. At their outer ends the plungers 22 are provided with pivoted segmental armatures 25, that engage the peripheral surfaces of the lower drums 13. The intermediate joints of the toggles 19 and 24 are connected by a link 26, which is of such length that when one of the toggles is straightened out the other will be buckled.

27 indicates a crank-shaft suitably mounted in the base 1 and provided with a crank-disk 28, which, as shown, is connected to the intermediate joint of the toggle 24 by a pitman 29. In practice the armatures 21 and 25 may be provided with antifriction-rollers for reducing the friction between the same and the peripheries of the cooperating eccentric drums.

The action will be substantially as follows:

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We will assume that the several eccentric drums are being positively rotated in the directions indicated by the arrows marked thereon in the drawing, in which case it will be noted that the magnets of the upper eccentric drums have just commenced to act on the cooperating armatures 21, while the magnets of the lower drums are just passing out of action on their cooperating armatures 25. Under continued movements of the drums the eccentric surfaces of the upper drums for the next half rotation move farther and farther away from each other, and their magnets, acting on the cooperating armatures 21, draw the plungers 20 away from each other and straighten out the upper toggle 19, and thereby draw upward the link 26 and buckle the lower toggle 24. The half-sections of the eccentric drums not containing magnets are non-magnetic, this being accomplished in any one of many ways—as, for instance, by constructing the said drums of brass. Under the first half-rotation of the drum just described the toggles and connecting-links are moved into the positions indicated by dotted lines in the drawing, and it is obvious that under the next following half-rotation of the drums the magnets of the lower drums will become operative to reverse the action of the toggles and move the parts back into the positions indicated by full lines in the drawing. In this way the connecting-link 26 is reciprocated and motion is transmitted to the shaft 27, being first converted into rotary motion by the crank-disk 28 and pitman 29. It will of course be understood that the mechanism described is capable of many modifications within the scope of the invention herein set forth and claimed. For instance, the so-called “eccentric” drums instead of being true cylinders might have any other form which would give them eccentricity. Of course the motion may be transmitted from the eccentric drums and cooperating armatures by mechanism other than that illustrated in the drawing.

I have proceeded on the following theory, to wit: that an armature may be much more easily removed from the field of the magnet

by relative transverse sliding movements than by direct outward pull, or, what is the same thing, a magnet may be moved away from its armature more easily by moving it transversely of the field or parallel to the face of the armature, and that therefore greater power is exerted by the magnets to pull the armatures outward than is exerted by the drum-driving mechanism in rotating the drums.

The above theory is one insisted upon by me.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The combination with a rotary eccentric carrier having peripherally-disposed magnets, of an armature subject to the said magnets and having connections for transmitting motion, which drum moves the said magnets transversely out of action on said armature, substantially as described.

2. The combination with a pair of eccentric drums and means for rotating the same so that they project simultaneously inward and simultaneously outward, the said drums having peripheral magnets, of armatures subject to the magnets of said drums, and a toggle connected to said armature and having connections for transmitting motion therefrom, substantially as described.

3. The combination with two pairs of eccentric drums and means for rotating the same, of magnets carried by said eccentric drums and disposed in segments thereof, armatures subject to the magnets of said drums, and connections from said armatures for transmitting motion therefrom, the magnets of the one pair of drums being arranged to act simultaneously on the cooperating armatures, and the magnets of the other pair of drums being arranged to alternate with the magnets of the corresponding drum of the other pair, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERICK HACHMANN.

Witnesses:

GENEVIEVE HIRSCH,
F. D. MERCHANT.