

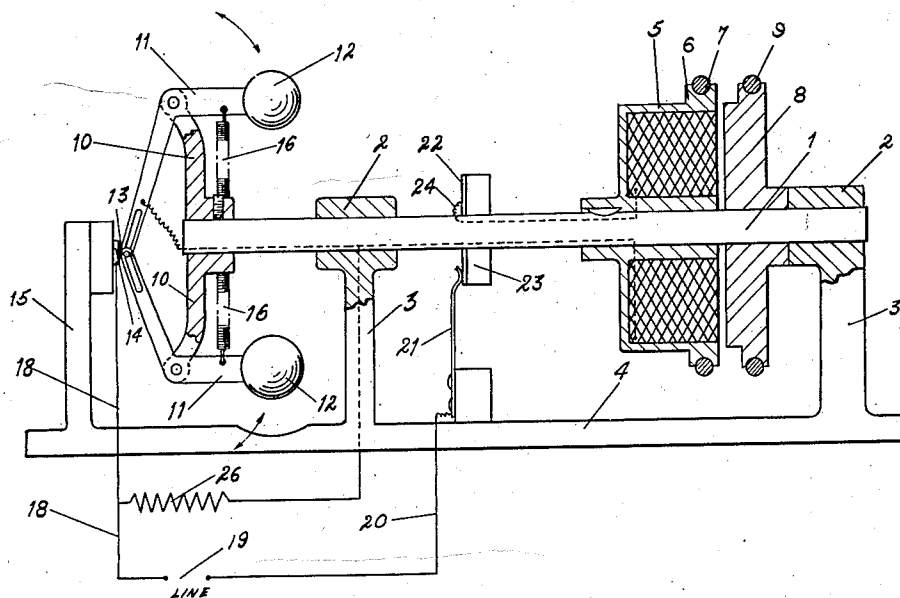
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GOVERNOR

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This invention relates to improvements in magnetic speed control mechanism, the principal object of the invention being to provide a device of this character embodying a magnetic clutch and in which device the current supplied to said clutch is automatically reduced when the speed of rotation reaches a predetermined limit.

A further object of the invention is the provision, in combination with a magnetic clutch, of centrifugally operated means for varying the current supplied to said clutch.

Other objects and advantages of the invention will appear as the description proceeds.

The drawing accompanying this specification is a longitudinal sectional view through a mechanism embodying the features of the present invention.

Referring to the drawing, 1 designates a shaft mounted for rotation in bearings 2 carried by standards 3 extending upward from a base plate 4. Keyed upon the shaft 1 at a point near one of its bearings is an electromagnet 5, the housing of which is of cylindrical form and is provided with a pulley 6 for the reception of a belt 7 by means of which the rotation of the electromagnet may be transmitted to any desired mechanism. Mounted on the shaft, between the electromagnet 5 and the adjacent shaft bearing, is a pulley 8 of a material capable of being attracted by said magnet 5, said pulley being freely rotatable and axially movable on the shaft and adapted to receive rotative motion by means of a belt 9 from any suitable source of power. The pulley 8 is maintained in such proximity to the electromagnet 5 as to constitute an armature which is attracted toward the electromagnet whenever the latter is energized, whereby the electromagnet and pulley will act as a clutch for transmitting motion from the belt 9 to the shaft 1 and the belt 7.

Secured on the shaft 1, at the end thereof, opposite from the pulley 8 is a pair of radially extending arms or brackets 10, in the outer forked end of each of which is pivoted a bell crank lever 11, one arm of which lies normally parallel with the shaft 1 and carries at its free end a weight 12. The other arms

of the levers extend approximately radially of the shaft and are suitably connected pivotally and carry a contact finger 13 normally in engagement with a contact member 14 secured upon but insulated from a standard 15 extending up from the base plate 4. The levers are normally retained with the contacts 13 and 14 in engagement by means of springs 16 secured at one end to the weighted arm of the lever and at its opposite end to the hub 17 of the bracket 10. The contact member 14 is connected by a wire 18 with one terminal of a source of electrical energy 19, the other terminal of which is connected by a conductor 20 with a spring finger 21 mounted on but insulated from the base plate. The spring finger 21 extends toward the shaft 1 and rests at its free end on a contact plate 22 carried by an insulating disk 23 secured on the shaft. The coils of the electromagnet are connected at one end by a wire 24 to the contact plate 22 and at the opposite end by a wire 25 to that arm of the bell crank lever 11 carrying the contact finger 13. It will thus be seen that as long as the contact finger 13 is in contact with the member 14 current will flow from the source 19, through conductor 18, contacts 14, 13 wire 25, electromagnet 5, wire 24, plate 22, spring finger 21 and conductor 20, back to the source, thus energizing the electromagnet and attracting the armature pulley 8, whereupon rotation of the pulley will cause rotation of the electromagnet thereby transmitting the motion of the belt 9 to the belt 7 and shaft 1. Should the rotation of the shaft exceed a certain predetermined speed limit, however, the centrifugal motion of the brackets 10 will cause the weighted arms of the bell crank levers 11 to swing outward in the direction of the arrow against the tension of the springs 16, thus carrying the contact finger 13 away from the contact member 14 and opening the circuit through the electromagnet. In order, however, that the current may not be completely cut off, a resistance element 26 is shunted across the wires 18 and 25, so that upon disengagement of the contacts 13, 14, the current will flow from conductor 18, through resistance 26 and wire 25, and thence over the

rest of the circuit above described, back to the source, thus cutting down the amount of current to the electromagnet and thereby weakening the magnetic clutch action between the pulley 8 and electromagnet 5 and permitting a certain amount of slippage between them. The speed of rotation of the electromagnet, and consequently of the shaft 1 will thus be reduced until that speed is reached at which the weighted lever arms have swung back toward the shaft sufficiently to cause re-engagement of the contacts 13 and 14, thereby permitting the current again to flow to the electromagnet through the regular circuit. It will therefore be obvious that the device serves to compensate for variations in load which the element 5 is required to carry and tends to maintain the driven mechanism at a constant speed. It will, of course, be understood that the voltage of the circuit will be regulated to correspond with the load to be driven.

I claim:

1. A magnetic speed control mechanism, comprising a pulley armature mounted for rotation, an electromagnet mounted for rotation in proximity to said pulley and adapted to attract the same and to form therewith a motion transmitting clutch, means for supplying current to said electromagnet and including a normally closed main circuit and a shunt circuit, a resistance element in said shunt circuit, and means rotatable with said electromagnet for automatically opening said main circuit and causing the current to flow through said shunt circuit thereby to reduce the current supply to the electromagnet when the rotation thereof has reached a predetermined speed.

2. A magnetic speed control mechanism, comprising a shaft mounted for rotation, a pulley armature mounted on the shaft for rotation relative thereto, an electromagnet secured on said shaft for rotation therewith and adapted to attract said pulley and form therewith a motion transmitting clutch, means for supplying current to said electromagnet and including a normally closed main circuit and a shunt circuit, a resistance element in said shunt circuit, and centrifugal means carried by said shaft and adapted automatically to open said main circuit and causing the current to flow through said shunt circuit thereby to reduce the current supply to the electromagnet when the rotation has reached a predetermined speed.

3. A magnetic speed control mechanism, comprising a shaft mounted for rotation, a magnetic clutch mounted on said shaft, one member of said clutch being secured to the shaft for rotation therewith, a normally closed circuit for supplying current to said clutch and including a fixed contact member, a movable contact member carried by said shaft and maintained in contact with said

fixed contact member, and centrifugal means associated with said movable member for automatically moving the same out of contact with the fixed member when the rotation of the shaft has reached a predetermined speed.

4. A magnetic speed control mechanism, comprising a shaft mounted for rotation, a magnetic clutch mounted on said shaft, one member of said clutch being secured to the shaft for rotation therewith, a normally closed main circuit for supplying current to said clutch and including a fixed contact member, a movable contact member carried by said shaft and maintained in contact with said fixed contact member, a resistance element shunted across said main circuit, and centrifugal means associated with said movable member for automatically moving the same out of contact with the fixed member thereby to open said main circuit and cause the current to flow through said resistance element when the rotation of the shaft has reached a predetermined speed.

In testimony whereof, I affix my signature.

JOHN M. MILLER.