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GOVERNOR

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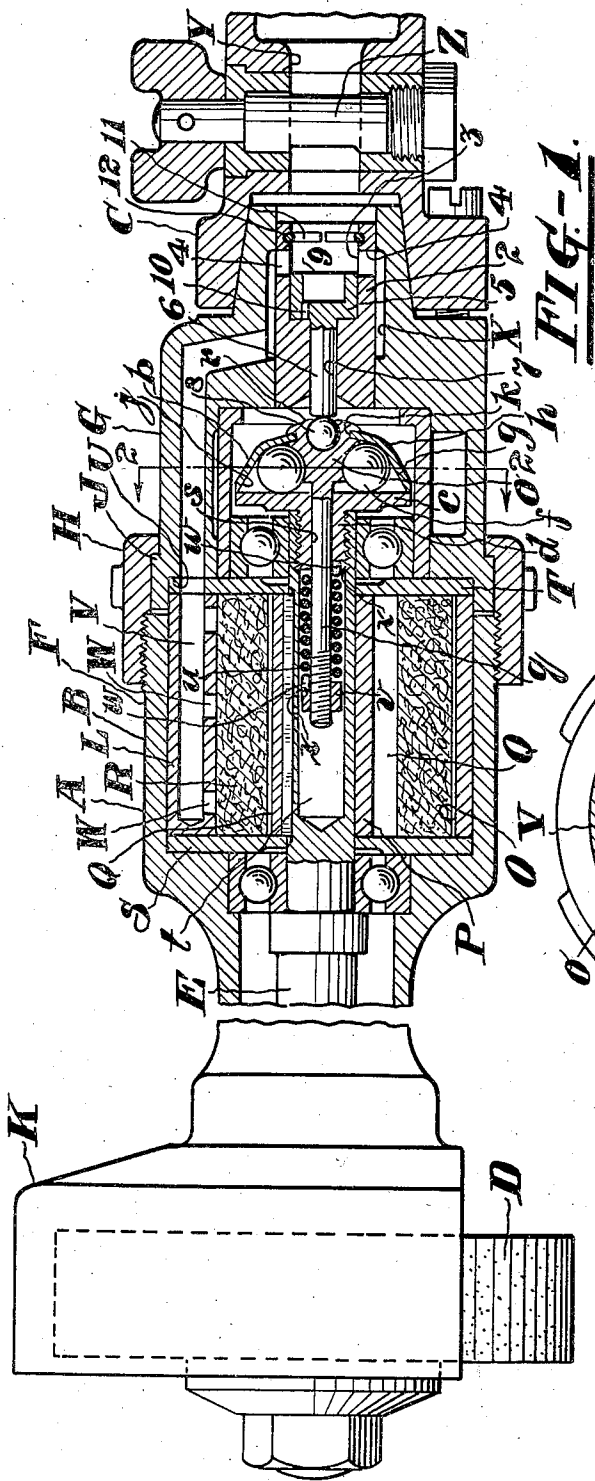


FIG. 1.

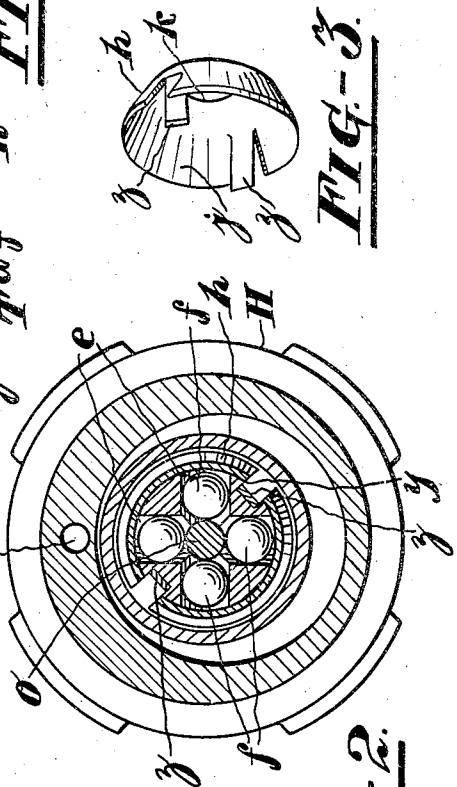


FIG. 2.

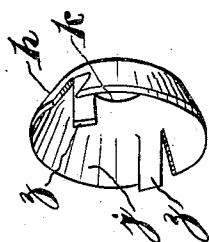


FIG. 3.

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GOVERNOR

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1 Claim. (Cl. 264—17)

This invention relates to governing mechanisms, and more particularly to governors adapted for use in connection with pressure fluid actuated motors for controlling the power supply thereto.

A few of the objects of the invention are to simplify the construction of governors of this character, to render the governor readily adjustable in accordance with the immediate speed requirements, and to assure a responsive action of the governor to the variations in speed of the motor whereby it is actuated and which it controls.

Other objects will be in part obvious and in part pointed out hereinafter.

In the drawing accompanying this specification and in which similar reference characters refer to similar parts,

Figure 1 is a longitudinal sectional view of the governor and a grinder to which it is applied,

Figure 2 is a transverse view taken through Figure 1 on the line 2—2, and

Figure 3 is a perspective view of a detail.

Referring more particularly to the drawing, A designates, in general, a grinder illustrated as being of the portable hand held type comprising a casing B having a handle C at one end and a grinding wheel D at the other end. The wheel D is mounted upon a shaft E which extends into the casing B. The casing B consists of two sections F and G arranged end to end and said sections are held together by a flanged sleeve H which acts against a shoulder J on the section G and is threadedly connected to the section F. On the section F is a guard K which partly encircles the grinding wheel D in a well known manner.

In the arrangement shown the casing section F constitutes a cylinder having a bushing L arranged therein, and the interior of the bushing serves as a chamber O for the accommodation of a rotor P keyed to the shaft E. In the periphery of the rotor are a plurality of slots Q for the accommodation of vanes R against which pressure fluid may act for rotating the shaft E.

Closures are provided for the ends of the chamber O in the form of plates S and T lying within the sections F and G, respectively. The plates and the bushing L are clamped firmly in position by a shoulder U in said casing section G and seating against the plate T.

The pressure fluid for actuating the rotor P may be supplied thereto and exhausted therefrom in a well known manner. In the present instance a supply passage V is formed in the bushing L to extend longitudinally of the chamber O, and communication is afforded between the supply

passage V and the chamber O through a plurality of ports W in the bushing L.

The supply passage V is extended through the plate T and the casing section G and opens into a bore X, in the section G, the bore X communicating at one end with a passage Y in the handle C and through which pressure fluid may flow from a source of supply for actuating the rotor P. In the handle C is a throttle valve Z for controlling the passage Y.

In accordance with the practice of the invention the grinder is provided with a governor b adapted to control the flow of pressure fluid to the chamber O in order to maintain a uniform speed of the rotor P. In the form illustrated, the governor b comprises a guide member c having a projection d which is threaded exteriorly for engagement with the interior of the shaft E. In the opposite end or surface of the guide member are grooves e which are preferably arranged in cruciform fashion to receive weights f in the form of balls and for which they serve as guides.

The portion of the guide member c wherein the grooves e are, and, therefore, the weights f are located is preferably in the form of a truncated cone. The peripheral or tapered surface g of the guide member serves as a seat for a correspondingly shaped cover h which acts as a closure for the grooves e and retains the weights f therein. The inner surface j of the bevelled portion of the cover h which overlies the outer ends of the grooves e acts as a bearing surface against which the weights f act to move the cover h relatively to the guide member c and, in this instance, longitudinally with respect thereto.

In the end of smaller diameter of the cover h is an aperture k for the reception of a hub o having a stem q on one end thereof. As a convenient method of securing the hub o to the cover h the end of the hub, adjacent the stem q, may project beyond the cover and be pined over the portion of the cover h which defines the aperture k, as indicated at r.

In the construction shown the stem q is an integral part of the hub o. It extends through and is guided by a bore s in the guide member c and into a bore t in the shaft E. Disposed about the stem q is a spring u which seats with one end against the stem d and with its other end against a nut v threaded on the free end of the stem q. The ends of the spring u terminate in longitudinally extending projections w which engage notches x in the nut v and the stem d to retain the nut in the position to which it may be ad-

justed for maintaining a correct tension in the spring *u*.

In order to prevent relative rotary movement between the cover *h* and the guide member *c* the guide member is provided with notches *y*, arranged in diametrically opposite sides of the guide member to slidably receive fingers or clips *z* on the cover *h*.

Disposed within the bore *X* is a valve chest 2 having a valve chamber 3 which communicates at one end directly with the passage *Y* in the handle *C* and in the valve chest 2 are ports 4 to communicate the valve chamber 3 with the bore *X*. Within the valve chamber 3 is a valve 5 to control the ports 4, and on the valve is a stem 6 which extends slidably through a bore 7 in the valve chest 5 and seats against the end of the hub *o* or, as illustrated, against a ball 8 embedded in the end of the hub.

The free end of the valve 5 constitutes a pressure surface 9 against which pressure fluid acts to press the stem 6 against the ball 8. The effective area of the actuating surface is, however, preferably reduced to the cross sectional area of the stem 6 as by providing the valve with a port 10 through which pressure fluid flows from supply to the opposite end of the valve 5.

Any suitable means may be provided to prevent the valve 5 from moving out of the valve chamber 3. The means illustrated for this purpose consists of a spring ring 11 seated in a groove 12 in the valve chest 2.

The operation of the device, briefly described, is as follows: Let it be assumed that the throttle valve *Z* is in the open position so that pressure fluid flows from the passage *Y* into the valve chamber 3 and that the valve 5 and the governor *b* will be in positions which they will occupy during the time the supply passage *V* is in full communication with the source of pressure fluid supply. With the parts in these positions pressure fluid passes through the valve chamber 3, ports 4, the bore *X*, thence through the supply passage *V* and the ports *W* into the chamber *O* to act against the vanes *R* for driving the shaft *E*.

When the shaft *E* reaches a sufficiently high speed the centrifugal force of the weights *f*, as applied to the inclined surface *j* of the cover *h*, will overcome the resistance of the spring *u*, and the cover will be actuated in the direction of the valve 5. Inasmuch as the stem 6 abuts the front end of the hub *o* the valve will then be moved to partially cover the ports 4 and thus diminish the supply of pressure fluid to the chamber *O*. If, due to increased resistance of the grinding wheel the speed of the motor is reduced the centrifugal force of the weights *f* will of course be correspondingly reduced and the spring *u* will then act to move the cover *h* in the direction of the guide member *c*. The pressure fluid acting against the actuating surface 9 will then cause the valve 5 to follow the movement of the cover *h* and thus afford a wider area of communication between the valve chamber 3 and the supply chamber *V* to again accelerate the speed of the motor.

We claim:

A governor comprising a rotary guide member having a pair of mutually perpendicular grooves in an end thereof, a projection on the other end of the guide member and being threaded externally for engagement with a rotating member, a cover for the grooves, a finger on the cover slidably interlocked with the guide member, an inclined surface on the cover overlying the outer ends of the grooves, balls in the grooves and being actuated centrifugally against the inclined surface to move the cover longitudinally of the guide member, a stem on the cover extending slidably through the guide member and the projection to retain the cover in coaxial relationship with the guide member, a nut on the stem, and a spring acting against the nut and the projection to resist the centrifugal force of the balls and interlockingly engaging the nut and the projection to maintain the nut in adjusted position.

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