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DIAL GOVERNOR

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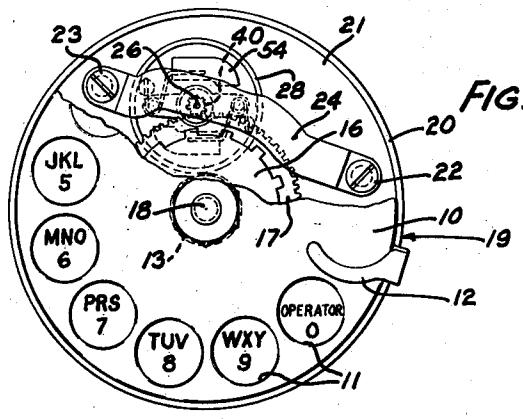


FIG. 1

FIG. 2

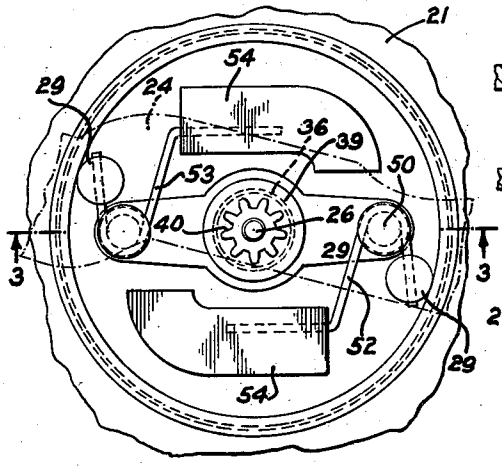
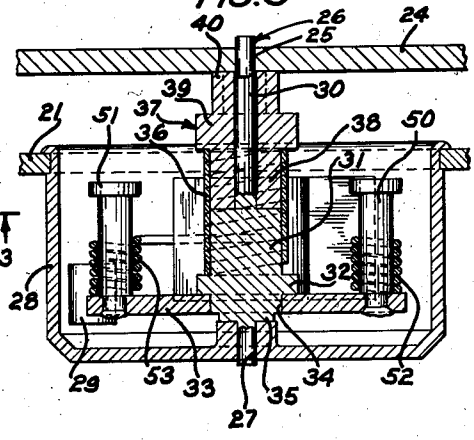


FIG. 3



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DIAL GOVERNOR

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3 Claims. (Cl. 179—90)

This invention relates to a dial governor and more particularly to a speed governing mechanism for a calling dial for automatic telephones.

It is an object of the present invention to provide a simple and effective mechanism for governing the speed of rotation of a dial.

In accordance with one embodiment of the invention, the impulsing wheel of a telephone calling dial is connected, through a clutch mechanism, to a governor shaft, which has a cross arm fixed thereto on which, in turn, there are supported a pair of pins designed to support coiled springs, each spring having a friction element at one end and a weight at the other end thereof. The cross arm and related parts are rotatably supported in a governor drum, and upon rotation of the cross arm, the weights will be thrown outwardly to force the friction elements into engagement with the walls of the drum. The spring supporting pins are positioned with respect to the wall of the drum and the length of the arms of the springs, which support the friction elements, are so proportioned that when the weights are thrown outwardly by centrifugal force, the friction elements will tend to wedge against the wall of the drum. The shaft carrying the cross arm is connected to the gear through a one-way clutch comprising a coiled spring encircling the shaft and a corresponding shaft on which the governor driving gear is mounted.

A better understanding of the invention will be had by reference to the accompanying drawing, wherein

Fig. 1 is a plan view of a telephone calling dial, part of the dial being broken away to show the impulsing wheel and the governor mechanism.

Fig. 2 is a plan view on an enlarged scale of the governor mechanism shown in Fig. 1, parts of the mechanism being shown in dot and dash lines to more clearly illustrate the details of construction of the governor, and

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2 in the direction of the arrows.

Referring to the drawing, wherein like reference characters designate the same parts throughout the several views, the numeral 10 designates a dial, for use in automatic telephone transmitting apparatus, provided with a series of finger apertures 11, whereby the dial may be rotated in a clockwise direction until the fingers of the person operating the dial engages a finger stop 12. The dial is of the type common to telephone dialing apparatus, and upon its release will be driven in a counter-clockwise direction by a spring motor 13 to rotate an impulse wheel or cam wheel 16 having impulsing contacts (not shown) associated therewith for transmitting pulses representative of the numbers dialed by the dialing mechanism. The dial 10, impulse wheel 16 and a gear 17 are mounted upon and rotated with a shaft 18 suitably journaled in a dial housing 19. The dial housing 19 is cup-shaped in configuration and has a circular wall 20 and a base 21.

Mounted upon the base 21, by means of screws 22 and 23, is a bearing bridge 24 having an aperture 25 therein in which there is journalled a governor shaft 26. The other end of the governor shaft is journalled in a bearing 27 formed in the bottom of a cup-shaped governor drum 28, the inner surface of the walls of which are adapted to be engaged by friction elements 29 when the spring motor 13 of the dial tends to rotate the dial more rapidly than is desired.

The shaft 26, as may be clearly seen in Fig. 3, has a shank portion 30, an enlarged portion 31, and an annular shoulder 32 formed thereon. The shank portion 30 extends upwardly and bears in the bridge 24, whereas the shoulder 32 rests against a cross arm 33, into an aperture 34, in which a portion 35 of the shaft 26 extends. The cross arm 33 is fixed to the shaft 26, preferably by ring-staking the portion thereof surrounding the aperture 34 into engagement with the portion 35 of the shaft. In this manner, the shaft and cross arm 33 are formed into a unitary structure which may be rotated by the gripping action of a coil spring 36 engaging the enlarged portion 31 of the shaft.

A clutch member 37 encircles the shank 30 of the shaft and has a portion 38 of the same diameter as the enlarged portion 31 of the shaft around which the coil spring 36 is coiled. The coil spring 36, as will be apparent by reference to Fig. 3, encircles the portion 38 of the clutch member and the portion 31 of the shaft 26, being positioned thereon between the shoulder 32 on the shaft and a shoulder 39 on the clutch member. The upper end (Fig. 3) of the clutch member 37 is provided with gear teeth 40, which mesh with the gear 17, and whenever rotation is imparted to the gear 17, either by the person operating the dial 10 or by the spring motor 13, the clutch member 37 will rotate with the gear 17. When the gear 17 is rotated in a clockwise direction, the clutch member 37 will be rotated in a counter-clockwise direction and will tend to

unwind the coiled spring 36 and therefore the shaft 26 will not be driven by the coiled spring. However, upon release of the dial 10, after it has been rotated in a clockwise direction, the spring motor 13 will drive the dial in a counter-clockwise direction, thereby rotating the clutch member 37 in a clockwise direction. Upon clockwise rotation of the clutch member 37, the spring 36 will grippingly engage both the clutch member 37 and the portion 31 of the shaft and will rotate the shaft 26 with the gear 17. When the shaft 26 is rotated, it will carry with it the cross arm 33, upon the outer ends of which there are fixed a pair of pins or studs 50 and 51. The studs 50 and 51 have loosely encircling them coiled springs 52 and 53, respectively, and the ends of the coiled springs 52 and 53 extend tangentially away from the studs, both ends of each spring extending in the same general direction. Each of the springs 52 and 53 carry on their extending ends the friction element 29 on one end and a weight 54 on the other end. It is believed to be apparent that when the shaft 26 is rotated at a relatively high speed, as it is when it is driven by the spring motor 13, the weights 54 will tend to fly outwardly at a tangent away from the shaft 26 and in so doing, will cause the friction elements 29 to bear against the inner wall of the governor drum 28. Since the weights 54 are interconnected with the friction elements 29 by the coiled springs 52 and 53, they will resiliently urge the friction members into engagement with the walls of the drum, thereby to slow the shaft 26 down and govern the speed of the dial 10 and its associated impulse wheel 16 when they are driven by the spring motor 13, and in this manner will control the speed at which the impulse wheel will actuate its associated contacts, not shown.

It should be noted that the pins 50 are spaced sufficiently from the wall of the drum 28 to permit the friction elements 29 to move to a position where they will be self-energizing in their braking action, i. e., the farther the weights 54 move from the center of the drum under centrifugal action, the greater will be the tendency of the friction elements 29 to move to a position where they will be wedged resiliently between the pins 50 and the drum 28, and the friction elements 29 will, therefore, exert progressively greater braking action as their supporting springs are rotated about their pins 50.

Although a specific embodiment of the invention has been described hereinbefore, it will be understood that some variations may be made in the structure without departing from the invention, which is to be limited only by the scope of the appended claims.

What is claimed is:

1. In a governor mechanism, a stationary drum, a shaft rotatable in said drum, a cross arm fixed to said shaft, a pair of studs, one mounted at each end of said cross arm, a multi-turn spring surrounding and freely supported on each of said studs and having the ends thereof diverging away from the stud, a friction member adapted to engage the drum fixed to an end of each spring, and a weight fixed to the other end of each spring.

2. A governor for telephone dials comprising a governor drum, a shaft journalled in said drum, a clutch mechanism associated with said shaft for driving the shaft when the clutch mechanism is rotated in one direction, a cross arm fixed to said shaft, a pair of pins fixed on opposite ends of said cross arm, a coiled spring encircling each of said pins a plurality of times and freely movable thereon, a weight fixed to an extending end of each coiled spring, and a friction member fixed to the other end of each coiled spring for engaging the inner surface of the governor drum, said spring ends acting independently.

3. In a governor mechanism for dial telephones, a cup-shaped governor drum, a bearing formed in the base of said drum and located centrally therein, a shaft journalled in said bearing, a cross arm fixed to said shaft, a pair of pins mounted adjacent opposite ends of said cross arm, a multi-coil spring loosely encircling each of said pins, said springs having ends thereof extending outwardly in substantially parallel planes away from the pin and said ends being unattached to each other, a friction member mounted on one of the extending ends of each spring for engaging the drum, a weight mounted on the opposite end of each spring, means for driving said shaft including a gear and a clutch for positively connecting the shaft and gear upon rotation of the gear in one direction, a second gear meshing with said first-mentioned gear, and a hand operated dial fixed to said second-mentioned gear.

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