

J. H. NORCROSS
CENTRIFUGAL TAB GOVERNOR
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FIG. 1

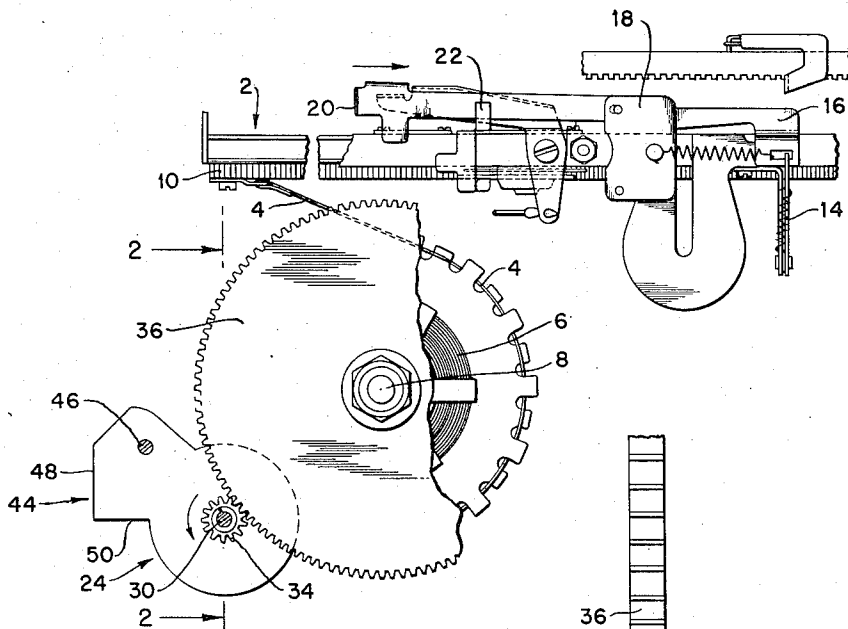


FIG. 2

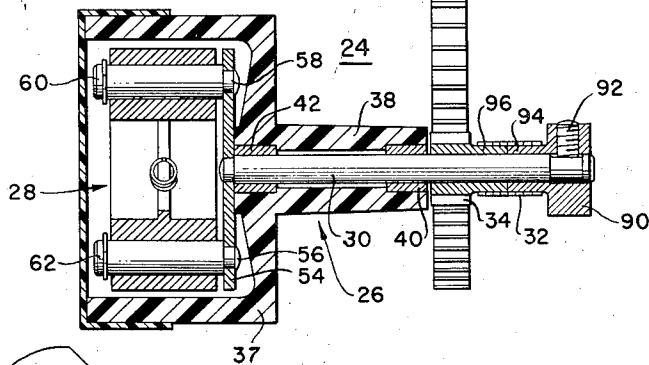
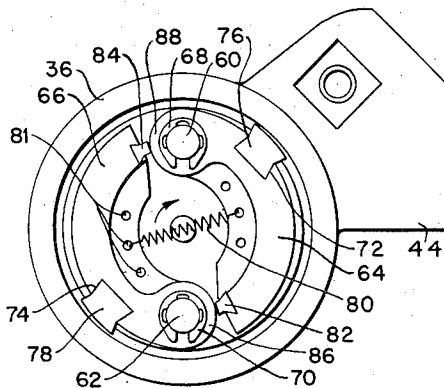


FIG. 3



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CENTRIFUGAL TAB GOVERNOR

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2 Claims. (Cl. 197—64)

This invention relates to typewriters and more particularly to an improved governor for a typewriter carriage.

It is well known in the art that it is necessary to provide some sort of a speed governor on a carriage in order to reduce shock after a tabulation run. The governor is connected to the carriage so as to be operable only when the carriage is moving in its normal escapement direction, and to be inoperable during a carriage return operation. One specific example of a tabulation governor is shown in U. S. Patent 2,129,650 assigned to the same assignee as that of the present invention.

It will be conceded by those skilled in the art that the most suitable sort of governor for carriage control during a tabulation run, is one that is speed sensitive, such as the well known centrifugal force operated governor, which type has been used in prior art typewriters. However, the conventional embodiment of centrifugal force governors have been found noisy and expensive, therefore, it is a first object of this invention to provide an improved inexpensive centrifugal force governor.

It is a further object of this invention to provide an improved centrifugal force governor which is quiet in operation.

It is a still further object of this invention to provide an improved centrifugal force governor wherein the co-efficient of friction between the operating surfaces will remain constant through prolonged use.

It is a still further object of this invention to provide an improved integral housing and mounting means for a centrifugal force governor.

Other objects of the invention will be pointed out in the following description and claims and illustrated in the accompanying drawings, which disclose by way of example, the principle of the invention and the best mode, which has been contemplated of applying that principle.

In the drawings:

Fig. 1 is a rear elevation of portions of a typewriter carriage and carriage control mechanism.

Fig. 2 is a side elevation taken through the plane 2—2 of Fig. 1 in the direction of the arrows; while

Fig. 3 is a front view of the centrifugal force governor and mounting means shown in Fig. 1.

Briefly, this invention relates to an improved centrifugal force governor wherein the housing and mounting means are an integral molded piece and wherein the flyweights have a nylon insert therein for contact with the inner-peripheral surface of the molded phenolic housing, whereby when the flyweights are forced outwardly through the inter-engagement of a motor gear and the pinion driving the flyweight shaft through a spring clutch, the nylon insert will engage the inner-peripheral phenolic surface of the housing to effect a braking force in response to the carriage speed.

With reference to the drawings, a carriage 2 is indicated as being moved in letter spacing (or normal escapement) direction by tape 4 which interconnects the carriage 2 with a well known spring motor 6. The lat-

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ter is mounted on the frame of the typewriter by some bolt or other mounting means 8.

It is well known that the carriage normally moves in the direction of the arrow under the influence of the spring motor 6 as controlled by an escapement pawl mechanism which is not shown. As the pawl is stepped from tooth to tooth of the carriage rack 10, the carriage will move from left to right as viewed in Fig. 1.

The operation of the tabulating mechanism for the IBM electric typewriter is shown in U. S. Patent 1,935,436 in complete detail, but generally speaking, a crank arm 14 is selectively operated under the influence of a tab key and its power driving mechanism, (neither of which is shown) to urge the right hand end of a tab check lever 16 into the plane of the paper. The tab check lever 16 is pivotally supported for movement into and out of the plane of the paper about a pivoting mechanism 18 so that the bent over tab stop 20 is moved outwardly to engage a tab stop in a well known manner as the right hand end 16 is pivoted into the plane of the paper. In the process of setting the tab lever for a tab operation, a pawl control lever 22 is rocked by the tab check lever out of the plane of the paper to lift the escapement pawls out of the escapement rack 10 whereupon the carriage is free to travel in the direction of the arrow under the influence of tape 4 and spring motor 6.

In order to control the speed of the carriage during a tabulation run, a tabulation governor 24 is provided to be operable in response to the speed of the carriage. The governor 24 comprises a combined housing and bracket member 26, a flyweight member 28 and a shaft 30 connected through a spring clutch 32 to a pinion 34. The pinion 34, in turn, is meshed with a motor gear 36 coaxially mounted with respect to the spring motor 6 to be rotatable therewith.

The combined housing and bracket 26 is molded from one of the phenolics, such as Bakelite to provide an integral cylinder 37, bushing 38 which supports a pair of bearings 40, 42 in which the shaft 30 is mounted for rotation relative to the cylinder 37, and a mounting bracket 44. The bracket 44 is provided with a mounting aperture 46 plus an integral mounting brace formed by the sides 48, 50 which ride in a complementary mounting portion of the typewriter frame (not shown). Through this structure, the governor can be mounted on the typewriter frame with its pinion 34 in engagement with the motor gear 36 through the operation of a single screw passing through the aperture 46.

A disc 54 is pinned or otherwise secured to the shaft 30, and in turn, provided with a pair of mounting apertures 56, 58 for holding a pair of shafts 60, 62 parallel to shaft 30 and for rotation about its axis. Conventional flyweights 64, 66, respectively, are mounted on the shafts 60, 62, respectively, and held in place by clips 68, 70 thereby providing for pivotal movements of the flyweights about their supporting shafts 60, 62. Each flyweight has a notch 72, 74 formed therein respectively, for carrying nylon inserts 76, 78 which extend peripherally beyond the outer limits of the flyweights thereby being adapted for engagement with the inner-peripheral surface of the cylinder 37. The flyweights are held normally together in a conventional manner by a spring 80 (which may be positioned selectively in various of the holes 81 to vary the operating range of the governor), and in order to reduce the noise of the flyweights returning to their normal position, each one has an insert 82, 84 respectively, of nylon or other resilient material, which engages the hubs 86, 88 respectively, of the adjacent flyweights.

The advantage of the use of the nylon inserts 76, 78 is that the material will not tend to rub off and coat the inner-peripheral surface of the cylinder 37 and, therefore, the co-efficient of friction existing between the nylon in-

serts and the inner-peripheral surface of the cylinder 37 will remain constant thereby alleviating the necessity of adjusting the operation of the governor even after considerable use.

The outer end of shaft 30 carries a mounting bushing 90 secured by a set screw 92 to the shaft. The spring clutch 32 is mounted to peripherally grip the hub 94 of the bushing 90 and the hub 96 of the gear 34 in such a manner that the spring is tightened when pinion 34 is rotated counterclockwise as viewed in Fig. 1. The tightening of the spring 32 grips the hub 94 of the bushing 90 to rotate shaft 30 counterclockwise (Fig. 1) which would be clockwise as viewed in Fig. 3. When the carriage is moved in a direction opposite to the arrow of Fig. 1, however, spring 32 is unwound to disengage the hub 94 from the pinion 34 so that the flyweights will not move out to engage the wall of cylinder 37.

The clockwise rotation of the shaft 30 as viewed in Fig. 3, will cause the flyweights 64, 66 to pivot about their respective supporting shafts 60, 62 so that the nylon inserts 76, 78 engage the inner peripheral surface of the cylinder 37 with a force that is proportional to the speed of rotation of the shaft 30. Accordingly, a braking force is applied to the carriage, which braking force is responsive to the speed of the carriage over its whole range of speed travel.

It has been found that the nylon Bakelite combination maintains the same co-efficient of friction through prolonged periods of operation, thereby establishing a speed control on the carriage which is sensitive to the carriage speed and which will operate without required adjustment during the prolonged periods.

While there have been shown and described and pointed out the fundamental novel features of the invention, as applied to a preferred embodiment, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art, without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. In a typewriter having a carriage freely movable under the control of the spring motor during a tabula-

tion run, a speed responsive governor operable to regulate the speed of the carriage during its flight comprising an integral phenolic mounting bracket and housing defining a cylinder, a shaft mounted in said housing coaxially of said cylinder, a one way driving means interconnecting said shaft and said carriage to provide for rotation of said shaft in response to carriage flight, a plate having a pair of flyweights pivotally mounted thereon, and means interconnecting said plate coaxially of said shaft to be rotatable therewith whereby said flyweights will pivot outwardly in response to centrifugal force, said flyweights having nylon inserts therein at their point of engagement with the inner periphery of said cylinder wall whereby a speed responsive governor having a substantially uniform coefficient of friction is provided for limiting the speed of said carriage during a tabulation run.

2. In a typewriter having a carriage freely movable under the control of the spring motor during a tabulation run, a speed responsive governor operable to regulate the speed of the carriage during flight comprising an integral Bakelite mounting bracket and governor housing defining a cylinder, a shaft mounted in said housing coaxially of said cylinder, spring clutch means interconnecting said shaft with said spring motor whereby said shaft is rotated at a rate proportional to carriage speed during a tabulation run, a plate having a pair of spaced apart flyweights pivotally mounted thereon, and means mounting said plate coaxially of said shaft for rotation therewith to cause said flyweights to pivot outwardly as a result of centrifugal force, said flyweights having nylon inserts therein as their point of contact with the inner peripheral wall of said cylinder, whereby said nylon inserts act as brake shoes to provide a speed responsive governor having substantially a uniform coefficient of friction, irrespective of length of use.

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