Oct. 6, 1936. J. L. PETZ 2,056,364

TYPEWRITING MACHINE

Filed May 17, 1935

FIG.1.

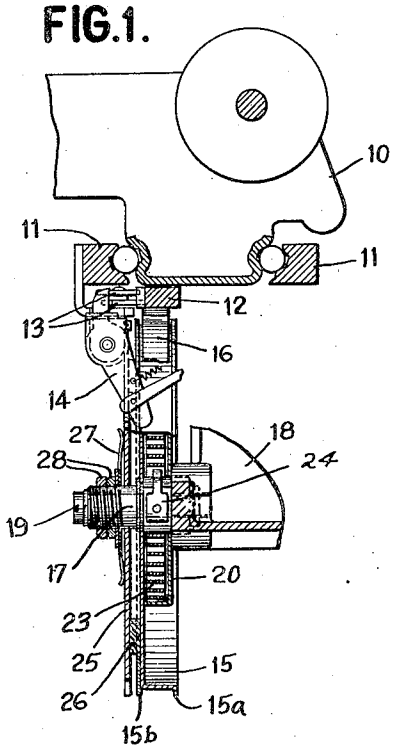
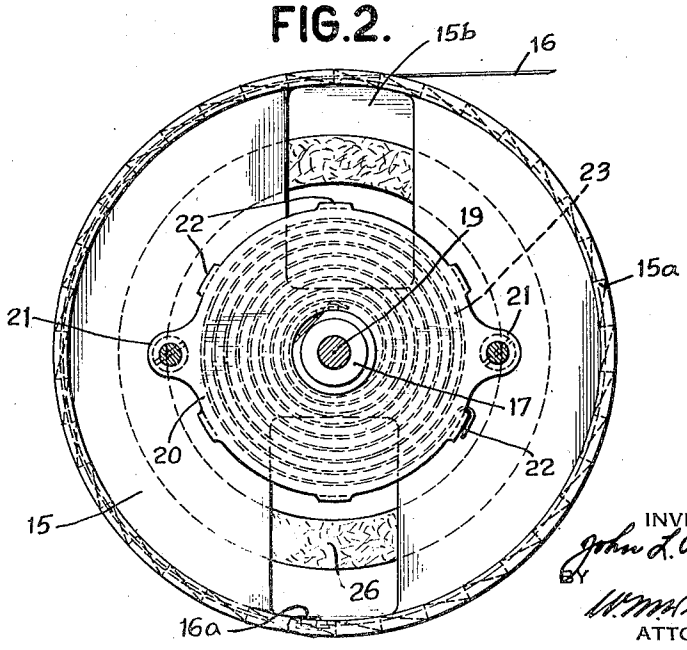


FIG.2.



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Patented Oct. 6, 1936 2,056,364

UNITED STATES PATENT OFFICE

2,056,364

TYPEWRITING MACHINE

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Application May 17, 1935, Serial No. 21,942

2 Claims. (Cl. 197—62)

This invention relates to typewriting machines in general.

The broad object of the invention is to improve the spring motor commonly employed to feed carriages used in typewriting machines and other machines.

An object is to provide an improved spring motor which exerts a more uniform feed tension on the carriage which it drives than former spring motors used for this purpose.

Another object is to provide a simple and cheaply constructed spring motor which not only exerts a more even tension on the carriage between wide limits of travel but dispenses with the need for too costly and more or less complicated spring tension adjusting drives usually considered essential in spring motors for driving carriages.

Another object is to provide a spring motor that is very easily adjusted to vary the tension of the driving spring.

Various other objects, advantages, and features of the invention will be specifically pointed out in the following description and claims or will be obvious from a study of the description, claims, drawing.

In the drawing:

Fig. 1 is a vertical section.

Fig. 2 is a large scale elevation of the spring motor as it would appear if viewed from the front of the machine.

Heretofore in the typewriting machine art, it has been customary to make the spring motors as small and compact as possible. Accordingly the spring motor usually comprises a small tape drum which acts as the casing for the spring and the latter usually expands against the inside of the drum so as to exert pressure on the walls thereof. As typewriter carriages usually have a total travel of over nine inches in writing one line, more than a full revolution of the drum takes place when the carriage is moved this distance. Consequently the tension of the spring is much greater at one limit than at the other limit of travel, particularly in machines having wide carriages. Furthermore, due to the small diameter of the tape drum and the enclosed spring, any adjustment of the spring to increase or decrease the tension necessitates a considerable rotation of the shaft or stud to which the inner end of the spring is usually secured. The various ratchet-and-pawl and worm-and-gear tension adjusting devices are generally provided which are expensive to manufacture and are liable to get out of order. Also they are accessible to the operator who may change the tension to suit his or her own ideas of speed which frequently results in excessive wear on the escapement mechanism and tabulating mechanism when the spring is adjusted too tight.

It has been found that by using a small diameter spring in a separate casing in combination with a relatively much larger tape drum that the tension exerted upon the carriage is made more uniform between its limits of travel. This result is possible because for each letter-space movement of the carriage and tape drum the end of the spring which is secured to the drum moves only a very small amount, hence, for a large movement of the carriage the end of the spring which moves with the tape drum travels only a very small fraction of the distance it travels in machines now on the market.

Fig. 1 shows how the improved spring motor is applied to an "electromatic" typewriter, the numeral 10 designating the usual carriage which is movably mounted in a well known way on guide rails 11. The escapement rack 12 is secured to the underside carriage and co-operates with a pair of escapement dogs 13. These dogs are operated by a lever 14 connected and actuated in the manner described in Patent No. 1,945,847. Immediately below the escapement rack 12, near the center of the machine, is mounted an improved spring motor incorporating the features of the present described invention.

The numeral 15 designates a tape drum which is flanged to form a bearing surface for a flexible tape 16, one end of which is fixed to the escapement rack 12, while the other end is removably attached in a known way to the drum 15. Drum 15 is also flanged at 15*a* and opposite this flange a ring 15*b* is welded or otherwise secured to the drum to provide a channel in which the tape 16 is partly wound on the drum 15.

Drum 15 is secured to a hub 17 which is rotatably mounted on a part of the framework 18 of the machine as by means of a stud 19. Concentric with hub 17 is a spring casing 20 which consists of a one-piece stamping conveniently provided with two ears 21 by means of which the stamping is fastened to the framework 18, screws, by preference, being used to secure the stamping to the framework. The stamping is substantially circular in outline, except where the ears 21 project radially, and is formed with a number of lugs 22 which project at right angles to the body of the stamping, or parallel with stud 17 into the shallow space formed by the large flange in the drum 15. The lugs 22

are arranged in a circle concentric with stud 17 and it will be noted that this circle is approximately half the diameter of the drum 15.

The stamping 20 acts as a carrier for the power spring 23 of the spring motor. This spring 23 has its outer end hooked over one of the lugs 22 by means of a U-bend, as shown in Fig. 2, while the inner end of the spring has a hole loosely engaged by a tongue formed in a stamping 24 spot welded or otherwise secured to a flat milled in hub 17. In order to adjust the tension of the spring during assembly of the machine, or when the machine is serviced, the drum 15 is rotated in a clockwise direction (Fig. 2) to wind the spring, the tape being first temporarily unhooked from the drum.

In order to provide for a certain amount of adjustability to compensate for change in tension from use and to initially secure the proper tension of the spring, two diametrically opposite slots or other means are provided in drum 15 to receive the headed rivet 16a to which the tape is fastened. This enables the drum to be turned a half revolution in either direction to secure the proper tension by merely unhooking the tape and placing the headed rivet in one or the other slots.

It has been found by experience that the degree of adjustment permitted by the two slots in the drum 15 is more than sufficient for practical purposes consequently elaborate and expensive tension adjusting devices, such as are now commonly used in typewriters, may be dispensed with.

The spring motor is combined with a carriage brake or governor which controls the speed of the carriage during tabulating operations. Loosely mounted on hub 17 is a ratchet wheel 25. Between the drum 15 and ratchet wheel 25 is a ring of suitable friction material 26 such as asbestos brake lining, concentric with the ring 15b which also serves to keep the ring 26 centered with respect to the stud 17. A multiprong friction spring 27 is loosely mounted on hub 17 between ratchet wheel 25 and a pair of nuts 28 threaded on hub 17. By screwing the nuts 28 toward or away from ratchet disc 25, the pressure of spring 27 on ratchet wheel 25 may be regulated and hence the force required to rotate drum 15 relative to ratchet wheel 25 may be regulated.

Normally the assembly including the hub 17, drum 15, and ratchet wheel 25 is free to rotate on stud 19, subject only to the tension of spring 23. During tabulating operations, an arm (not shown) connected to the tabulating mechanism is moved into engagement with the teeth in ratchet wheel 25 and prevents movement of said wheel. Drum 15 can still turn relative to the ratchet wheel 25 but less freely due to the friction between the drum, ratchet wheel, and the brake lining. Thus, the carriage is prevented from moving too fast during tabulating operations.

The principal advantages of the construction just described are its cheapness, it being composed mainly of sheet metal stampings and few turned parts, and the absence of a complicated tension device; its ease of assembly; and the simplicity of adjustment of the tension. Due to the fact that the spring 23 is not permanently fastened to either the hub 17 or casing 20 but merely loosely engages a lug 22 and the tongue in stamping 24, the assembly and replacement of springs is facilitated as the spring need merely be pressed into the casing 20 without removing the latter from the machine, and the drum 15 rotated clockwise (Fig. 2) by hand until the proper tension is obtained.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification, 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 combination with the frame of a typewriting or like machine, a tape drum, rotatably mounted on said frame, a carriage feeding tape removably attached to the periphery of said drum and partly wrapped thereon; a spring casing secured to said frame and comprising a sheet metal stamping provided with a series of bent-over lugs projecting into the interior of the drum and arranged in a circle concentric with the periphery of the drum, said circle being of considerably smaller diameter than the diameter of the drum; and a power spring housed within said lugs, one end of spring being anchored to one of said lugs and the other being anchored to the drum near its axis of rotation.

2. In combination with the frame of a typewriting or similar machine having a carriage, a hollow feed drum, a carriage feeding tape secured to the carriage and removably attachable to the periphery of the drum in one of at least two points; a hollow spring casing secured to said frame, said casing comprising a one-piece stamping extending parallel with the feed drum and substantially concentric with the axis of rotation of the drum, said stamping being formed with bent-over lugs bent at right angles to the body of the stamping and disposed in a circle concentric with the axis of the drum; and a power spring housed in said casing, one end of the spring being secured to the drum at a point near its axis of rotation and the other end being attached to one of said lugs.

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