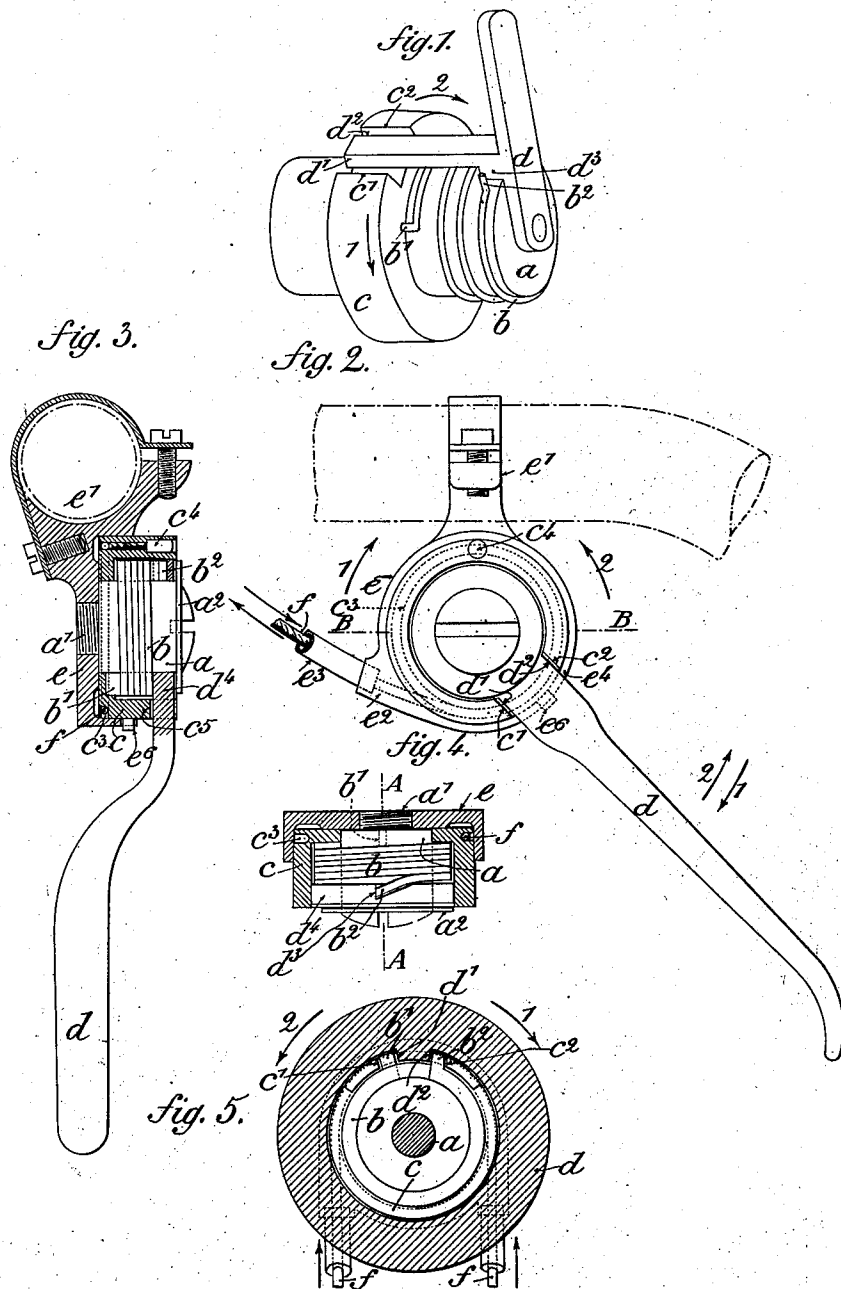


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L. E. RÉMONDY.
IRREVERSIBLE CONTROLLING APPARATUS.
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Witnesses

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IRREVERSIBLE CONTROLLING APPARATUS.

No. 823,971.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LÉON EMILE RÉMONDY, a citizen of the Republic of France, residing at Vincennes, 85 Avenue de la Republic, in the Republic of France, officier d'artillerie, have invented certain new and useful Improvements in Irreversible Controlling Apparatus, of which the following is a specification.

This invention relates to an irreversible controlling apparatus which comprises in principle a helical spring forcibly placed on a fixed drum, a sleeve loosely mounted with respect to the said drum, and a controlling member also loosely mounted with respect to the said drum. The controlling member and the sleeve are provided with abutment-surfaces by means of which the controlling member can move the sleeve either forward or backward. On the other hand, the spring has its ends so arranged as to be moved by the controlling member and by the sleeve in such a manner that when it is rotated either forwardly or backwardly by the controlling member, the direction being of no account, the hold of the spring on the drum will be loosened and the controlling member will be enabled to move the sleeve, while on being moved by the sleeve, at least in one direction of rotation, the spring is retightened on the drum and prevents the sleeve from revolving. The result is that in the said direction of rotation the controlling member is rendered automatically irreversible. The same effect can be obtained in either direction of rotation by arranging the ends of the spring in a suitably symmetrical manner.

In the accompanying drawings, which show, as examples, two embodiments of my invention, Figure 1 is a diagram of an apparatus shown for demonstrative purposes. Fig. 2 is an elevation of a controlling apparatus for the brakes of cycles. Fig. 3 is a vertical sectional view of the same on the line A A of Fig. 4. Fig. 4 is a horizontal sectional view on the line B B of Fig. 2. Fig. 5 is an elevation of an apparatus for demonstrative purposes, the controlling member of which is irreversible in both directions of rotation.

In Fig. 1, *a* designates a fixed drum; *b*, a helical spring forcibly placed on the drum; *c*, a loose sleeve or pulley, and *d* a loosely-mounted controlling member. The said controlling member *d* is provided with two abutment-surfaces *d'* *d''*, located opposite two sur-

faces *c'* *c''*, formed on the sleeve, so that the surface *d'*, acting on the surface *c'*, revolves the sleeve in one direction 1 and the surface *d''*, acting on the surface *c''*, revolves the sleeve in the opposite direction 2. The angular space between the surfaces *c'* *c''* is slightly greater than that between the surfaces *d'* *d''*, so that the controlling member *d* has a certain amount of play with respect to the sleeve. One end *b'* of the spring is invariably secured to the sleeve *c* and the other end *b''* is free. The controlling member has an abutment-surface *d''* located opposite the end *b''*, and the arrangement of the said parts is such that when the surfaces *d''* *c''* are in contact there remains between the surface *d''* and the free end *b''* a free space smaller than that between the surfaces *d'* *c'*, whereby when the controlling member *d* is released the spring *b* is normally tightened on the fixed drum *a* and locks the sleeve *c* against movement in the direction of the arrow 1, for if it is endeavored to revolve the sleeve in the said direction by acting directly on the same the spring *b* tightens on the drum and offers to the rotation a resistance which is all the greater as the effort made to revolve the sleeve increases. On the contrary, when the controlling member *d* is turned in the direction of the arrow 1 its surface *d''* meets first the end *b''* and causes the spring to untighten, and then the surface *d'* meets the surface *c'* and causes the sleeve to revolve in the direction of the arrow 1. When the controlling member *d* is released, the spring *b* again exerts its grip and prevents the sleeve from continuing its movement of rotation in the direction of the arrow 1. When the controlling member *d* is acted on in the direction of the arrow 2, its surface *d''* carries onward the surface *c''*, the sleeve, and the end *b'* of the spring, so that the latter loosens its grip and allows the sleeve to revolve in the direction of the said arrow.

In the embodiment shown in Figs. 2 to 4 the parts which correspond to those hereinbefore described are designated by the same letters.

The fixed drum *a* is secured by a screw-thread *a'* on a bracket *e*, adapted to be secured by means of a yoke *e'* on the handle-bar of a bicycle, for example. The spring *b* is constituted by a steel band wound edge-wise so as to form a spiral spring the inner diameter of which is slightly smaller than the

diameter of the drum, so that it must be forced in order to place it on the latter.

The sleeve *c* is so recessed that its rim will surround the spring *b*. The said sleeve is provided with a slit in which a bent end *b'* of the spring is set without play. On the other hand, the periphery of the sleeve comprises a groove *c'*, in which passes a flexible transmitting member *f*, attached in a hole *c''* of the rim. The said flexible member leaves the sleeve and passes through a tube *e'*, formed in the bracket *e*, and then through a flexible tube *e''*, which is applied to the tube *e'*. The member *f* and the tube *e''* form together a flexible transmitting member of a well-known kind, which may be connected to a bicycle-brake in the usual manner. The member or cable is stretched by a spring (not shown) and tends to revolve the sleeve in the direction of the arrow 1. The rotation in this direction tends, furthermore, to tighten the spring *b* and is normally prevented by the latter.

The controlling member *d* consists of a lever the annular head *d'* of which is loosely mounted on the drum *a* within the sleeve *c*. The arm of the lever loosely engages a recess *c''* in the rim of the sleeve in such a manner that the end faces or surfaces *c'* and *c''* of the recess or slot can be carried onward by the lateral surfaces *d'* *d''* of the lever.

A flange *a'*, formed on the drum, holds or maintains the sleeve, the spring, and the lever in place on the bracket *e*. The latter is so shaped as to partly surround the sleeve *c* and is provided in its periphery with a slot *e'*, in which a pin *c''* of the sleeve is slidable in such a manner as to limit the rotation of the latter in either direction.

The operation is as hereinbefore described: On the lever being moved in the direction of the arrow 2 the surface *d''* of the lever carries onward directly the sleeve by means of the surface *c''* of the latter, loosening the spring *b* and causing the cable *f* to be wound on the sleeve against the tension of the contracting spring. (Not shown.) If the lever is moved in the direction of the arrow 1, its surface *d'* acts first on the end *b''* to loosen the spring. Then its surface *d'* carries onward the sleeve *c* by means of its surface *c'*, allowing the cable to unwind. Finally, if the lever *d* is released the spring *b* tightens on the drum and prevents the sleeve from revolving under the action of the stretched cable or transmitting member *f*.

The same arrangement may be used for controlling the various parts of the mechanism of automobile road-vehicles—for instance, the brake, the ignition mechanism, accelerator, and change-speed gear—or for any other mechanical purpose requiring controlling apparatus which is irreversible in one direction.

Fig. 5 shows an arrangement which gives irreversibility in either direction. In this

case both the ends *b'* *b''* of the spring are free and placed with a certain amount of play between the surfaces *c'* *d'*, on the one hand, and the surfaces *c''* *d''*, on the other hand. When the member *d* is released and it is tried to revolve directly the sleeve *c* in the direction of the arrow 1, the surface *c'* carries on the end *b'* of the spring and causes the latter to tighten on the drum. If it is tried to revolve the sleeve in the direction of the arrow 2, the surface *c''* carries on the end *b''* and the spring tightens also. In both cases the rotation of the sleeve is impossible. On the other hand, if the member *d* is actuated in one direction or the other it acts first either by *d'* on *b'* or by *d''* on *b''* in such a manner as to loosen the spring, after which it carries the sleeve onward.

In the embodiment shown the surface *d'* carries on the surface *c'* of the sleeve through the medium of the end *b'* itself. Likewise *d''* carries onward *c''* through *b''*. Obviously the controlling member may comprise distinct surfaces or projections to carry onward one end of the spring and the corresponding surface or projection of the sleeve. As in the first embodiment described, the abutment-surfaces *d'* and *d''* may be either distinct or confounded in a single one.

The apparatus can be used for operating other than flexible transmitting members. The sleeve *c* can, for instance, be keyed to a shaft which it controls, or it can be provided with a pinion, worm, or other piece of driving mechanism, the rotation of which in one or both directions is to be prevented. The drum *a* can be fixed to any suitable part of the machine-frame or the like or can be independently movable. The controlling members *d* may be a lever, a hand-wheel, a handle, crank, pulley, pinion, worm, fly-wheel, or the like. The sleeve *c* itself can be of any desired shape or may be replaced by any equivalent piece of mechanism. To simplify the construction, the piece *c* can even be dispensed with, the transmitting member being in that case directly fixed to the spiral spring *b* and wound directly on the drum. In those applications where the sleeve *c* would on account of trepidations be liable to revolve out of season all that need be done will be to add either a spring which will maintain the member *d* stable in position or any kind of friction device to prevent it from impinging, when not required, the end *b''* of the spiral spring and producing the loosening of the same.

I claim—

1. A controlling apparatus comprising a rotatable controlling member, a receiving member mounted to rotate concentrically with the controlling member, a fixed drum, and a spring wound spirally on said drum and normally gripping said drum, substantially as described.

2. A controlling apparatus comprising a drum, a spring wound spirally thereon and adapted to normally grip said drum, a controlling member, a sleeve provided with a recess, said controlling member mounted in
5 said recess, substantially as described.

In testimony that I claim the foregoing as

my invention I have signed my name in presence of two subscribing witnesses.

LÉON EMILE RÉMONDY.

Witnesses:

DANIEL WEHLIN,
MAURICE KOUX.