PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in Control-lever Mechanism

I, CHARLES SOMVILLE, a Subject of the King of the Belgians, of 75, rue du Trône, Brussels, Belgium, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:

The invention relates to a control device, which adapts itself particularly to a bicycle brake control but can be used for other mechanical applications. In relation to the known devices of this kind, the object of the invention has the advantage that it acts to produce a linear motion with a variable increasing or decreasing speed and an amplifying effect.

According to the present invention, a cable control device particularly for bicycle brakes comprising a casing, a hand lever, and a cable, and is characterised in that the hand lever is pivotable about a pivot fast to the casing and carries another pivot about which can oscillate a beam to one end of which the said cable is attached and the other end of which beam is in permanent contact with a stop fast to the casing.

The end of the beam to which the cable is attached comprises a curved portion on which the corresponding part of the cable bears.

The curved portion of the one end of the beam, the other end of the beam, and the position of the stop are arranged in such a manner that by the manual operation of the hand lever, the cable is submitted to a traction which is approximately linear and longitudinal of the cable.

This device permits the transformation of the rotary movement of the handle to a linear movement of the cable, which is no longer submitted to flexing stresses, which tend to cause rapid deterioration and rupture. By amplifying the movements, it permits the small movement of the normal action of an ordinary brake-handle, to bring about large displacements of the cable.

[*Price* 2/-]

In the particular application to the brake control of a bicycle, this device in the shape of a handle brings about a very rapid and amplified initial displacement, which allows a quicker travel of the brake shoes, and, consequently, fast take-up of the initial slack or non-working displacement at the moment where the action of the brake is necessary. The wider spacing initially at rest of the brake shoes also allows the wheel to be removed more easily, especially in case of puncture, and it abolishes the serious inconvenience during normal operation of contact of the shoes on a warped felly.

Again, by this means to a normal displacement of an ordinary brake handle, there corresponds a very large working stroke. The handle will only reach its limit position at the end of its stroke after a total wear of the brake shoes. Finally, this device, which gives a smooth, progressive and strong braking action, as soon as the shoes are entering in contact with the felly, allows the use of braking shoes of greater thickness, which in turn means longer duration of wear.

The invention also provides, as a support for this control device, a casing of simple construction containing all the members without having any protruding parts. This casing, of one or several pieces, of steel sheet iron, aluminium, etc. or appropriate alloy, fits on the handle bar and comprises a strap cut or punched out of sheet iron or the like, the ends of which are brought together one to the other and tightened under the handle bar by a screw or bolt.

The annexed drawing shows as an example, a handle according to the invention particularly for use for a bicycle brake control, together with different constructions of the casing.

In this drawing:

Fig. 1 is a view in elevation with partial section showing the control mechanism in the interior of a first type of casing.

Fig. 2 is a view in elevation of the mechanism adapted to a second type of casing.

Fig. 3 is a view corresponding to Fig. 2 and showing the two angular displacements of the control handle, communicating to the control cable a rapid initial displacement before the tightening of the brake shoes.

Fig. 4 is a section taken at the line IV-IV of Fig. 5, which gives a view in elevation of a third type of casing.

As shown in Fig. 1 about an axis *1* supported transversally by the sides of a casing *2* and fastened as will be hereinafter explained, to the handle bar *3* of the bicycle, there can rotate a control handle *4* made of steel, aluminium or any other suitable metal or alloy and formed by casting, punching or stamping. This handle *4* provided with a pivot *5*, parallel to the axis *1*, so that when it rotates about the latter, pivot *5* describes either to the left, or to the right in Fig. 1, circular arcs having *1* as centre and the distance between *1* and *5* as radius.

On pivot *5*, is mounted a lever *6* formed for instance of the same material and by the same method as handle *4*. This lever is coupled thereby to handle *4* whilst it can rotate around pivot *5*. At its upper end, lever *6* has a peripherical groove *7* in the shape of a circular arc in which is fastened permanently by any appropriate means the end of the control cable *8* of of the bicycle brake. At its lower end, under pivot *5* lever *6* has the shape of a beak *9* whose right hand face has a gradient which is initially slight, as at *10*, and then continues with a short and steep curve *11*. Said curve *11* bears normally on a fixed axis *12* also carried transversely by the sides of casing *2* and serving also as a stop for the handle *4*, when in its extreme lower position.

When handle *4* is freed lever *6* bearing by its curve *11* on the fixed axis *12* brings back, under the effect of the traction of cable *8*, pivot *5* towards the left and handle *4* to its lower limit position, as shown in Fig. 1.

As soon as a strain drives handle *4* upwards, i.e. in the direction of braking, pivot *5* describes a circular arc towards the right hand with axis *1* as centre and driving lever *6* also towards the right. The latter bearing by its curve *11* on the fixed axis *12*, causes this curve to slide on the axis *12*, whilst the axis *12* bearing on the gradient *10* further increases the rotation movement of lever *6*, whose peripherical groove *7* makes a rapid movement towards the right, exerting thereby on cable *8* a traction in the same direction. There is thus realized a rapid movement, which corresponds to a movement through angle α of handle *4* and causes a longitudinal displacement of cable *8* of about 13/32". It has for object to bring brake shoes nearer to the bicycle rim more rapidly.

If the movement of handle *4* continues further than angle α, pivot *5* continues its displacement towards the right, but for each angular displacement around *1*, as centre, there is a less and less linear displacement; the action is progressively slower.

Further, according to the amount by which pivot 5 displaces itself in its circular movement towards the right, around *1* as centre, lever *6* is driven upwards. The slight gradient 10 moves then on to the axis *12*, which causes an amplification of the movement for the upper part of lever *6* and compels groove *7* to turn downwardly causing a long stroke of cable *8* and a displacement of the latter along the horizontal line. As said above, angle α corresponds to a rapid displacement of the cable of about 13/32".

The different angles β^1, β^2, β^3, β^4, constitute the corresponding angles of slow displacements of a total value-angle—of about 19/32" (working C-C' C-C stroke).

It is to be noticed that, if one uses a brake handle so conceived for the control of an integral floating brake, the shoes resting at a distance of 13/32" from the rim can be actuated so eliminating effects of warping of the wheel, moreover one can provide with complete security a working and wearing stroke of 19/32" for each shoe.

If now such a handle is used for the control of an ordinary brake, the shoes at rest at a distance of 3/16" from the rim can be actuated and one can provide with complete security a wearing stroke of 5/16" for each.

As a support for this control mechanism, different types of casings made of steel, aluminium or any suitable metal or alloy, obtained by casting, cutting or stamping, have been represented in Fig. 1 to 5. In the case of Fig. 1, the casing proper *2* is fastened to handle *3* by a member *13* cut or stamped and rolled around the latter in such a way that its ends apply to the lateral sides of casing *2*; a screw or bolt *14* tightens this end on the casing.

According to a second construction (Fig. 2), casing *2* is formed in one piece, two straps *15* made out of the sheet iron serving as fixation elements. The case being in fact fitted on the tube of handle *3*, these straps *15* are brought together one to the other under said tube and tightened by means of a nut *16* and bolt *14*. The tightening of the nut *16* of the latter is

facilitated by the fact that it is done through one of the two openings *17* made in the lateral flank of casing *2* as a consequence of the cutting and folding of the two straps *15*.

In another construction (Figs. 4 and 5), the fastening element to handle-bar *3* is distinct from the casing proper *2*, the lateral sides of casing *2* being pierced each with a slot or groove made by cutting. In these slots or grooves are introduced the two ends of a member *19* cut out or stamped, and rolled around a handle-bar *3*; these ends are afterwards brought together one to the other under the handle-bar and tightened by a bolt with a nut *16*. This tightening is easily performed through openings 20 cut out in the two lateral faces of the casing.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:

1. Cable control device particularly for bicycle brakes, comprising a casing, a hand lever, and a cable, characterised in that the hand lever is pivotable about a pivot fast to the casing and carries another pivot about which can oscillate a beam to one end of which beam the cable is attached and the other end of which beam is in permanent contact with a stop fast to the casing.

2. Cable control device as claimed in claim 1 characterised in that the end of the beam to which the cable is attached comprises a curved portion on which the corresponding part of the cable bears.

3. Cable control device as claimed in claim 2 characterised in the curved portion of the one end of the beam, the other end of the beam and the position of the stop are arranged in such a manner that by the manual operation of the hand lever, the cable is submitted to a traction which is approximately linear and longitudinal thereof.

Dated this 31st day of July, 1946.

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Patent Agents for the Applicant.

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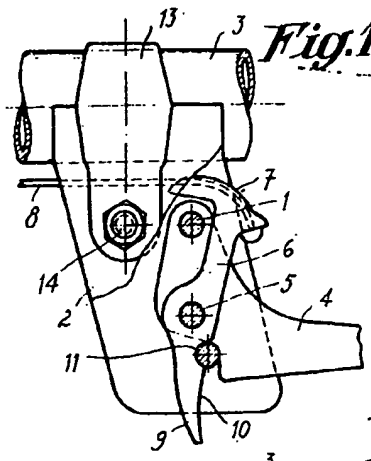

Fig.1

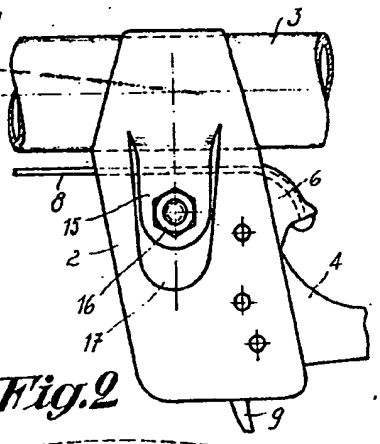

Fig.2

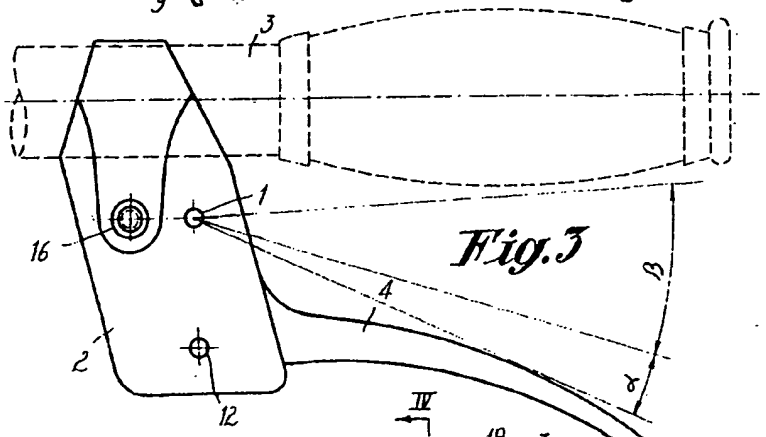

Fig.3

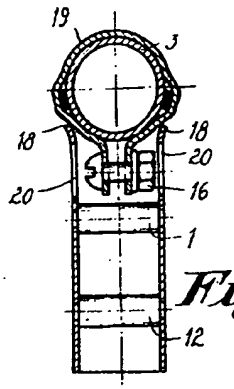

Fig.4

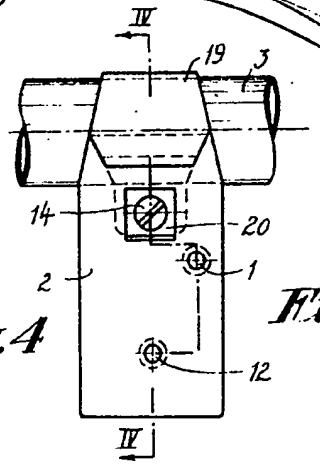

Fig.5

H.M.S.O.(Ty.P.)