Nov. 18, 1924. 1,516,125

W. T. SEARS

CONTROLLING PEDAL MECHANISM

Filed Dec. 12, 1922 2 Sheets-Sheet 1

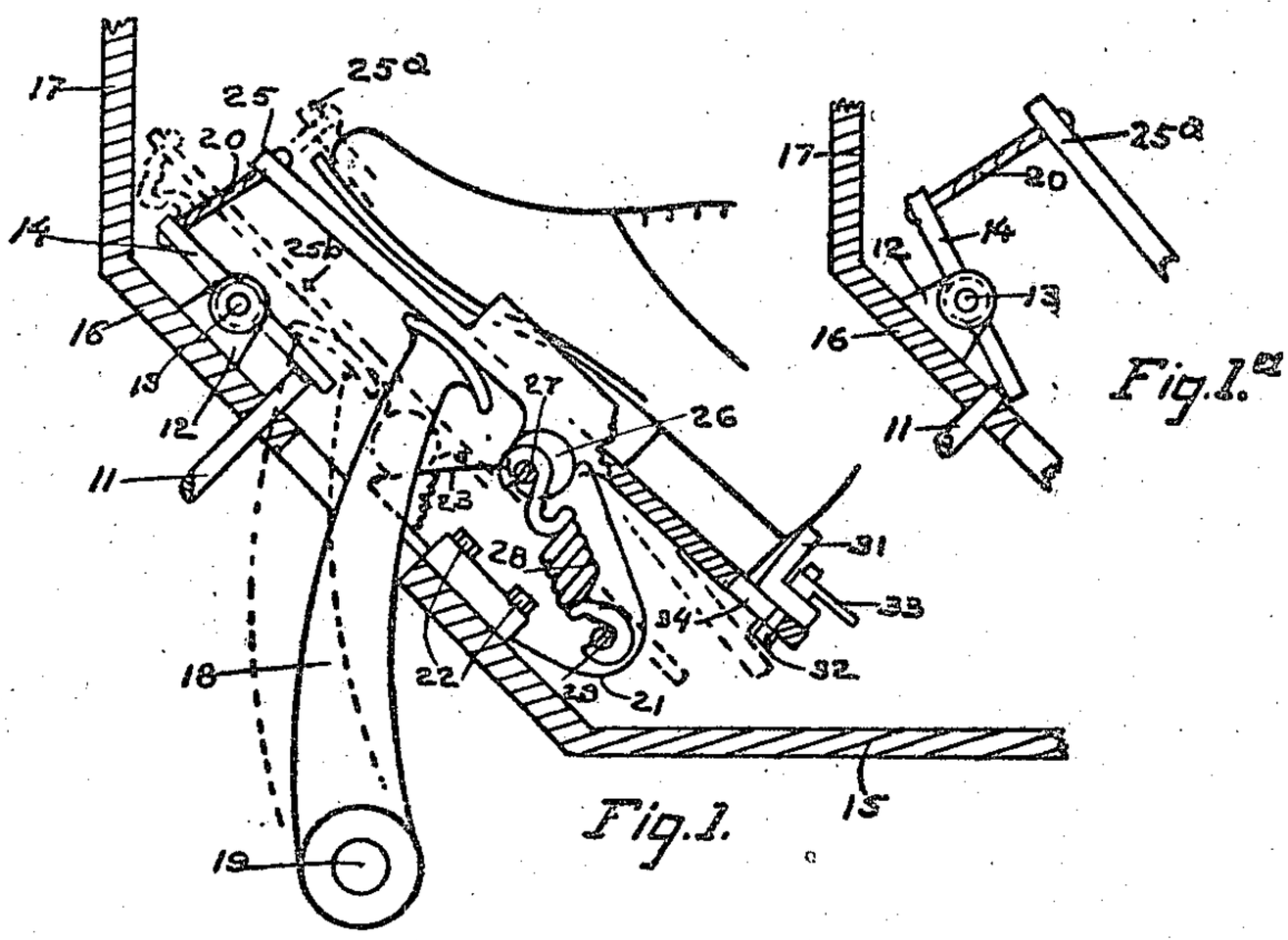

Fig. 1.

Fig. 1a

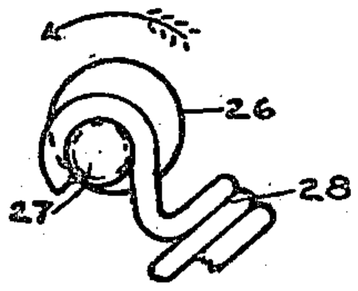

Fig. 2.

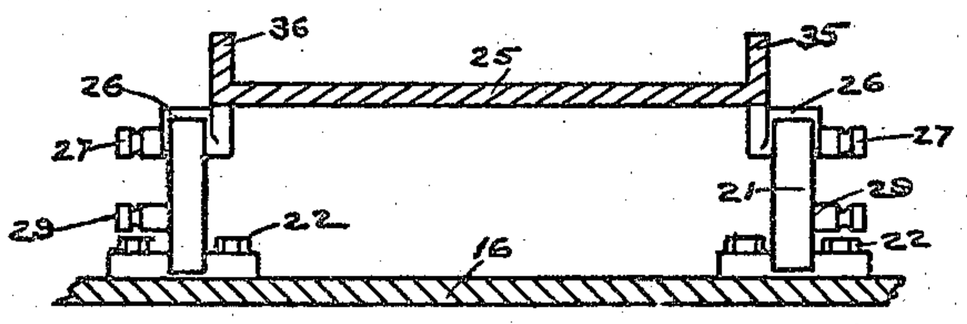

Fig. 3.

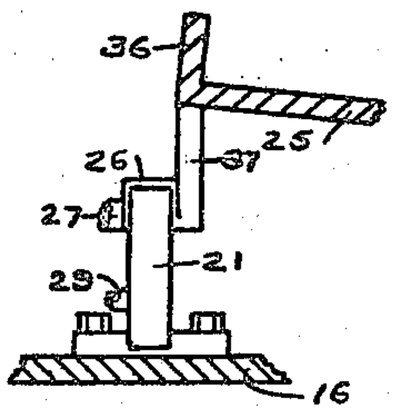

Fig. 10.

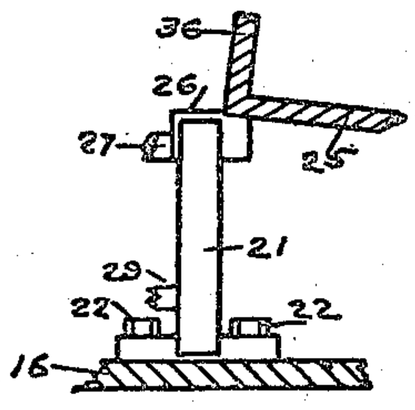

Fig. 11.

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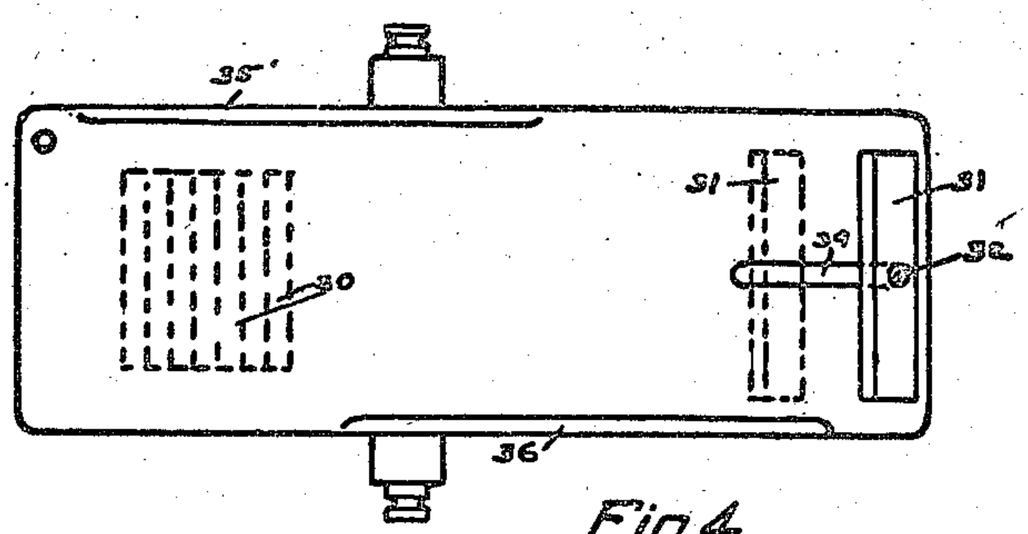


Fig.4.

Fig.5.

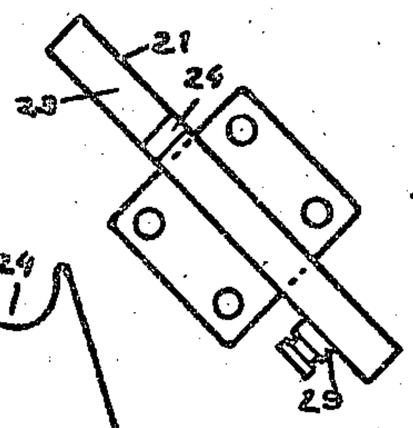
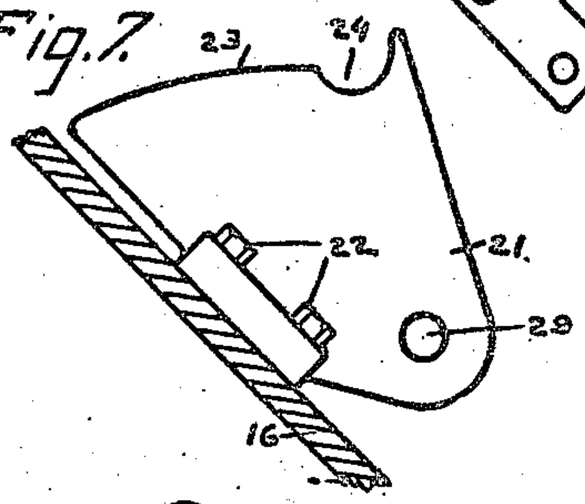


Fig.6.

Fig.7.



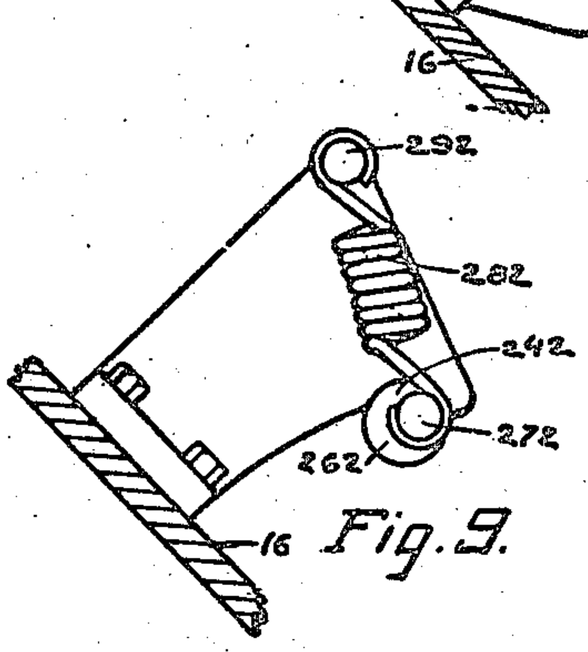


Fig.9.

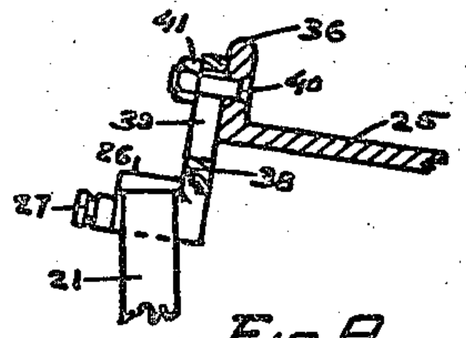


Fig.8.

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Patented Nov. 18, 1924. 1,516,125

UNITED STATES PATENT OFFICE.

WILLARD T. SEARS, OF MONTCLAIR, NEW JERSEY; MABEL HELENA SEARS EXECUTRIX OF SAID WILLARD T. SEARS, DECEASED.

CONTROLLING-PEDAL MECHANISM.

Application filed December 12, 1922. Serial No. 606,355.

To all whom it may concern:

Be it known that I, WILLARD T. SEARS, a citizen of the United States, residing at Montclair, New Jersey, have invented certain new and useful Improvements in Controlling-Pedal Mechanism, of which the following is a specification.

My invention relates to controlling pedal mechanism especially designed for the foot-control of an automobile, and it has for its object to provide certain improvements in devices of this character. My invention is designed to afford control by a single pedal of functions which, heretofore, have usually required more than one pedal.

My invention consists in certain features of construction and combinations and arrangements of parts, all of which will be fully described herein and particularly pointed out in the claims.

The present invention, as to some of the features thereof, may be regarded as an improvement on the pedal mechanism which constitutes the subject matter of my prior Patent No. 1,307,794, dated June 24, 1919.

The present application, with the exception of one feature which will be pointed out hereinafter, is a division of my prior application filed Feb. 2, 1921, Serial No. 441,796.

My invention is illustrated in the accompanying drawings, in which

Fig. 1 is a side elevation, partly in section, of a pedal and associated devices.

Fig. 1[a] is a fragmentary view showing the accelerator connection fully operated.

Fig. 2 is a detail, on a larger scale, of a pivot or trunnion and its attached spring.

Fig. 3 is a cross-section of the pedal back of its pivot and showing the brackets in elevation.

Fig. 4 is a top view, and Fig. 5 is a side view of the pedal detached.

Fig. 6 is a plan, and Fig. 7 is a side elevation of one of the brackets upon which the pedal is mounted.

Fig. 8 is a fragmentary sectional view of the left hand part of the pedal, the left hand bracket and an adjustable trunnion whereby the degree of lateral tilting of the pedal can be regulated.

Fig. 9 is a side elevation showing a modified form of supporting bracket.

Figs. 10 and 11 are fragmentary sectional views illustrating different modified means for giving a lateral inclination or tilt to the pedal.

In the form of the invention shown in Figs. 1 to 7 inclusive, 15 represents the floor board of an automobile, 16 the foot board and 17 the dash board. 18 is the brake lever of the car pivoted at 19. 20 represents a cable or other flexible connection to the throttle of the engine, so connected thereto that a pull on said cable opens the throttle and when the tension on the cable is relaxed, the throttle is automatically closed as by a spring. This is what is commonly called the accelerator connection.

In my parent application Serial No. 441,796, the cable 20 went through the foot-board 16 and was connected in any suitable way with the throttle. In the present instance and preferably said cable is connected to one arm of a lever 14 of the first order pivoted at 13 to a bracket 12 secured to the foot-board 16 the other arm of said lever overlying the stem 11 of the ordinary type of accelerator plunger usually employed in motor cars, so that a pull on cable 20 depresses said plunger.

This form of accelerator connection is preferable where the invention is applied to existing cars, as it requires less change therein. With the exception just mentioned the present invention is as described in my said parent application.

Two brackets 21 are fastened as by bolts or screws 22 to the foot-board 16, one at the right and one at the left of the brake lever 18. Each of these brackets has an upper edge 23 and, near the forward extremity of said edge, a shallow bearing depression 24, Fig. 7.

The controlling pedal 25 has on each side thereof a pivot or trunnion 26 which normally rests in the bearing or depression 24. Each trunnion has projecting from the end thereof a grooved pin 27 to which is connected one end of a tension spring 28, the other end of which is connected to another grooved pin 29 projecting from the side of the bracket 21 at the lower forward corner of said bracket.

The construction is such that when the foot rests upon the pedal as in Fig. 1 a tilting of the foot downward at the heel and upward at the toe rocks the pedal 25 about the trunnions 26 as a pivot to some such po-

sition as that indicated in broken lines at 25ª. It will be perceived that the result of this motion is to pull the cord 20 and open the throttle; and of course the extent to which the throttle is opened will depend upon the extent to which the pedal is rocked. It will be perceived that the weight of the foot and leg can rest comfortably on the pedal whether the throttle is open or closed, and in whatever position the pedal may be rocked to. The extent to which the throttle is opened depends solely upon the angle at which the pedal and foot are held, and the foot rests comfortably on the pedal at any angle that would occur in practice.

In order to give the spring 28 a tendency to rock the front end of the pedal downward, the pin 27 is placed eccentrically of the trunnion 26, so that said spring has a tendency to rock said trunnion in the direction of the arrow in Fig. 2. The principal purpose of this arrangement is to hold the pedal down on the brake lever 18 so as to prevent rattling when the foot is off the pedal.

The brake is applied by straightening the leg and pushing forward on the pedal as a whole. The natural instinctive impulse of a person sitting in a vehicle and confronted with an instant necessity of stopping, is to brace himself backward from his feet, and this impulse results in pushing the pedal forward. The trunnions 26 are thus forced out of their shallow bearings 24, and are slid forward along the edges 23 of the brackets 21, to some such position as that shown by broken lines at 25ᵇ in Fig. 1.

This motion of the pedal has two effects, namely, it operates the brake lever 18, and relieves any tension there may have been on the cable 20, thus by one motion applying the brake and closing the throttle, at least in so far as the throttle is controlled by the pedal. The sliding forward of the trunnions 26 along the edges 23, stretches the springs 28, and when the pressure of the foot is relieved, said springs draw said trunnions back into the bearings 24 and so restore the pedal to normal condition. These springs thus perform the function of restoring the pedal after an application of the brake and holding said pedal releasably in its bearings, and they also serve to hold said pedal down on the brake lever to prevent rattling.

In order to lessen or to overcome any tendency of the pedal to slip on the end of the brake lever 18, I have in the present instance as shown in Figs. 4 and 5 provided said pedal on its underside with transverse corrugations 30, or equivalent unevennesses. This is of advantage in some cars, although in other cars, where the required direction of motion is different, it may not be useful.

The guiding edge 23 of each bracket 21, is preferably made on a curve approximately parallel to the direction of motion of the end of the lever 18 where the latter makes contact with said pedal. This enables the brake to be applied with little or no sliding of the pedal over the end of the brake lever. In the particular case illustrated in Fig. 1, this direction is about horizontal; but it varies in cars of different makes, and the brackets can be varied in form accordingly. In some instances it may be preferable to make the bracket like that shown at 212 in Fig. 9. In this form of bracket, the slideway consists of the lower edge 232 of the bracket, the bearing depression 242 faces downward, and the pin 292 for the spring 282 is in the upper corner of the bracket. The spring 282 is stiff enough to withstand the ordinary pressure of the foot, but yields and allows the trunnions to slide forward and downward along the way 232 when extra pressure is applied to operate the brake. Other variations in the form of bracket can of course be resorted to to fit different conditions.

As more clearly shown in Figs. 1, 4 and 5, the pedal is provided with a heel-rest 31 to position the driver's foot lengthwise of the pedal. The form of this heel-rest or stop can of course be varied considerably. That shown consists of a piece of angle metal. Obviously, the best position of the foot, lengthwise of the pedal, will depend upon the length of the foot, and I have accordingly made this stop adjustable. To this end it is fastened to the pedal by means of a bolt 32 and wing-nut 33, said bolt passing through a longitudinal slot 34 in the pedal. This heel-stop is shown in the drawing adjusted to the rear end of the slot to suit a long foot, and in Fig. 4 is shown in broken lines adjusted forward for a shorter foot. This heel rest adds greatly both to the comfort and to the safety of the device as it keeps the foot in proper position to control the accelerator. The construction is such that it can be adjusted in a moment to suit the driver.

I have also shown the pedal made with an upstanding flange 35 along the right hand forward edge thereof. This prevents the driver from unconsciously getting his foot from a position over the brake lever where it would be inconvenient to apply full braking pressure. There is another raised part or flange 36 on the left hand rear part of the pedal to prevent too great heel movement. The pedal is so made that a reasonable amount of foot movement is allowed for the comfort of the driver. It is necessary to limit the forepart or ball of the foot to prevent its ever getting into an unhandy braking position, but without limiting the ease of operation or decreasing its safety function the width of the pedal at the heel

support can be made considerably greater than the part directly over the brake lever and thus give a wide range of foot positions. The disposition of the guide flanges, 35, 36 and 31, can be varied within limits indicated.

Another matter affecting the comfort of the driver is connected with the fact that in many cases when sitting at the steering-wheel and with his foot on the pedal it is not natural to have the foot flat in a right and left direction. In most cars the pedal is worked with the right foot and in many cases, especially where the distance between the steering-wheel and the brake pedal is short or when the driver is exceptionally tall the knee is thrown toward the right to clear the steering-wheel and this tends to throw the foot into an inclined position; in fact, even aside from the conditions just mentioned when the foot is resting on a pedal, its natural position is somewhat inclined rather than perfectly flat.

In order to provide for a lateral tilting of the foot, various expedients can be resorted to and some of these are illustrated in the drawing. For example, in Fig. 10, I have shown the trunnion pin 26 connected with the body of the pedal 25 by an elevated bracket 37 which throws the left side of the pedal a little higher than the right side.

In Fig. 11 I have shown the left hand bracket 21 made taller than the right hand bracket, thus throwing the pedal 25 into an inclined position. The same thing could be accomplished by blocking up the left hand pedal above the foot board 16. In carrying out this method, however, it is necessary to take care to keep the curved slideway 23 in proper relation to the motion of the upper end of the brake lever 18.

My preferred means, however, for accomplishing this tilting of the pedal is shown in Fig. 8 where the pin 26 is not made integral with the panel 25, but is part of a separate piece 38 which is connected with the pedal with provision for adjustment whereby it can be arranged to suit the person who uses the car. This can be accomplished in a variety of ways. As shown here, the piece 38 has a vertical slot 39 therein and a bolt 40 passes through the flange 36 and through said slot 39 and has a nut 41 which, when loosened, allows the adjustment to be made and which when tightened preserves it. In place of clamping this pedal in a fixed inclined position relatively to the trunnion axis it can be so constructed that it will pivot on the trunnion and adjust itself automatically to whatever foot angle the driver may prefer or find the most comfortable. It should preferably have a spring or be so balanced that when the foot is removed the pedal will set itself to a definite position. So far as I am aware I am the first to provide any controlling pedal of this general character which can be rocked to control the machine with means for adjusting it to regulate the lateral tilt or incline of the pedal.

One advantage of the described construction of pedal and its supports is that it can be very readily applied to cars that have already been built and are in use. Such cars have usually been made with an accelerator pedal and a brake pedal arranged side by side.

My brackets 21 can be fastened to the footboard in the proper relation to the brake pedal, and a connection to the throttle can readily be made by means shown in Fig. 1 and already described, the cable 20 being secured to the front or toe end of the pedal 25.

The invention is capable of many variations in details within the principle described.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In apparatus of the class described, the combination of a lever to be operated and a pedal having a sliding motion to operate said lever, said pedal having corrugations to engage the end of said lever to lessen the liability to slipping.

2. In apparatus of the class described, the combination of a controlling pedal means for adjusting the lateral inclination of said pedal.

3. In apparatus of the class described, the combination of a pedal supported for two kinds of motion, one of which is a pivotal motion, and means for adjusting the lateral inclination of said pedal.

4. In apparatus of the class described, the combination of a pedal and a transverse pivotal mounting thereof, with means for adjusting the body of the pedal relative to its pivotal axis to regulate the lateral inclination of said pedal.

5. In apparatus of the class described the combination of a pedal and a transverse pivotal mounting therefor with connecting means between the body of the pedal and the pivotal axis which permit lateral tilting of said pedal.

6. In apparatus of the class described, a controlling pedal having pivotal and bodily motion and one side of said pedal being higher than the other to conform to the natural position of the user's foot.

7. In controlling pedal mechanism for motor cars, the combination with a brake lever and a plunger depressible to open the throttle of the car, of a pedal mounted for pivotal motion and for another motion, means whereby said other motion operates said brake lever, and means including a motion-reversing device connected to that

end of the pedal which moves toward the driver when the pedal is rocked, to depress said plunger.

8. In controlling pedal mechanism for motor cars, the combination with a brake lever and a plunger depressible to open the throttle of the car, of a pedal having a pivotal motion and a bodily motion, a lever of the first order for depressing said plunger, and a flexible connection from the toe end of said pedal to said lever, said bodily motion of said pedal operating said brake lever and relaxing said flexible connection to insure closure of said throttle.

9. In apparatus of the class described, the combination with two controlling connections, of a pedal and a support therefor allowing to said pedal a pivotal motion to operate one of said connections and a sliding motion to operate the other connection, and a restoring spring arranged to return said pedal after a sliding displacement and eccentrically connected so as also to return said pedal after a pivotal displacement.

In testimony whereof, I WILLARD T. SEARS, have signed my name to this specification in the presence of a subscribing witness, this 11th day of December, 1922.

WILLARD T. SEARS.

Witness:
ARLO WILSON.