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CLUTCH FOR AUTOMOBILES
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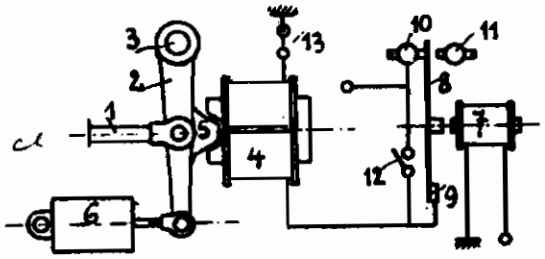


Fig 1.

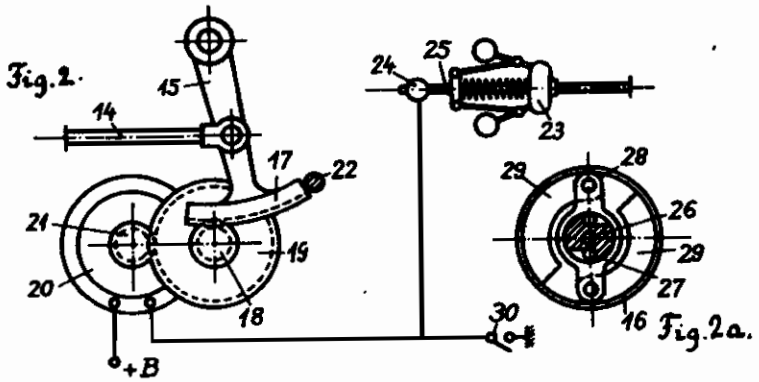
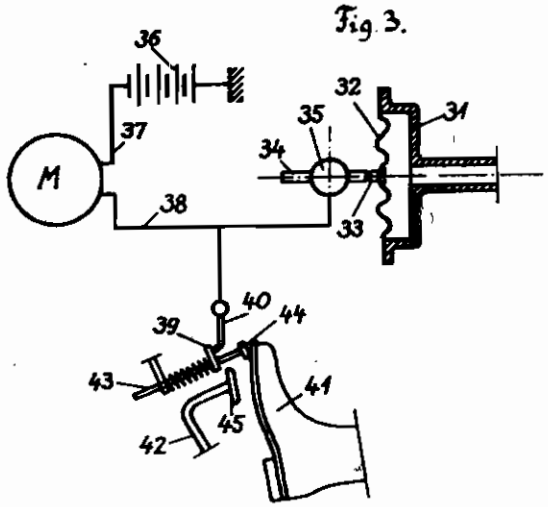


Fig. 2.
Fig. 2a.

Fig. 3.



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ALIEN PROPERTY CUSTODIAN

CLUTCH FOR AUTOMOBILES

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Clutches for use in automobiles are known, which clutches are let in when a certain speed of the motor has been reached.

It is further known to let in motor car clutches automatically, by the aid of damping devices, no shocks being caused thereby.

The present invention relates to a combination of such known devices, in which combination disengagement of the clutch may be effected at any speed desired and even at stillstand of the automobile driving engine.

In the drawing, three embodiments of the invention are shown by way of example. In each of these three types, disengagement of the clutch is electrically effected.

Fig. 1 illustrates a shock absorber acting by the aid of an air damper, the control of the electric current being obtained from a relay.

Figs. 2 and 2*a* show a shock absorber operated by friction, the control of the current being effected by a centrifugal governor.

Fig. 3 shows a device controlling the current by means of a vacuum.

Obviously, the means used for controlling the electric current which in the first embodiment (Fig. 1) is a relay, in the second embodiment (Fig. 2) is a centrifugal governor, and in the third embodiment (Fig. 3) is partial vacuum, may be interchanged in any way desired so that, for example, the first device, instead of by a relay, may be actuated by a centrifugal governor or a vacuum, and vice versa.

In Fig. 1, a bar 1 acting on the clutch (not shown in the drawing) is articulated to a lever 2 which has its fulcrum at 3. At one end of the lever, at 8, is mounted a shock absorber 6 (known per se) such as, for instance, an automatic and noiseless door closer, acting by the aid of an air damper. Lever 2 is provided with a jawed lug 5 acting as the armature of an electromagnet 4. To such electromagnet, current is supplied from the storage battery of the automobile. Switching in or off of the current is effected by a coil 7, to which current is fed from the light generator of the vehicle. One end +D of the coil is connected to the positive pole of the generator, while the other end is connected to the electric mass of the vehicle, which mass is permanently connected to the negative pole of the generator. When the speed of the engine of the vehicle is low, the tension of the generator will be so small that a spring 8 arranged opposite coil 7, and secured at 9, cannot be attracted, so that it will be in the position shown in the drawing. In this position, the spring is, by its other extremity, applied to a contact 10 connected to the positive pole +B of the storage battery. Thus, the current of the battery will pass through spring 8 and, by 9, through the winding of the electromagnet 4, and, from there, through the cut-off switch 13 to the electrical mass of the vehicle. Thereby, bar 1, in a direction opposite the arrow, is brought into the position shown, in which the armature 5 has been attracted by the magnet. This position corresponds to the disengagement of the clutch. When the tension of the light-generator increases, due to an increase of the speed of the engine of the vehicle, spring 8 is attracted by the coil 7, the contact is interrupted at 10, and the spring is connected to a stop 11. Thereby, the electromagnet 4 becomes currentless, the force attracting the armature 5 will be stopped, and damper 6 attracts bar 1 in the direction of the arrow, whereby the clutch is softly let in.

In order to enable the clutch to be released when the speed of the engine has not yet sufficiently decreased to bring spring 8 into the position shown, a switch 12 is provided, which is connected to a gas lever, so that, if the gas supply be completely cut off, the said switch is thrown into circuit. The battery current may now flow through the electromagnet 4, the spring 8 being avoided. Such operation of the clutch will take place, for example, when the car is started, for the purpose of changing the speed. When descending, even at the greatest speed of the vehicle, the number of revolutions of the motor will be but small, and therefor, only little fuel will be consumed.

The clutch as shown in Figs. 2 and 2*a* substantially distinguishes itself from the type as shown in Fig. 1 by that, at the end of a lever 15, a toothed segment 17 is arranged which meshes with a gear 18, which together with a larger gear 19 is mounted on a gear shaft. The said larger gear meshes with a pinion 20 mounted on the shaft of an electromotor 21. When this electromotor has been started, lever 15 is moved to the right and into the position shown in the drawing. A stop 22 will prevent the said lever from progressing. In this position the clutch is disengaged. Since, as a rule, the device will not remain in this position longer than a few seconds, there is no danger that the motor might be burnt. In case, however, that release of the clutch should take more time, a special device would be required, which is not described here. Engagement of the clutch is effected if a bar 14 is moved in the direction of the arrow, by the

strength of springs arranged in the usual manner in the clutch operating device. The shock absorber as used in this embodiment is shown in Fig. 2a. On the shaft of the electromotor is secured a free wheel disc 26 which in the shown direction of rotation drives a drum 27. This drum is provided with arms 28, on which are pivoted weights 29 fitted to a fixedly arranged jacket 18. When rotating, the weights, due to the centrifugal force, are pressed against the fixed jacket 16, and friction is produced, which brakes the rotation. Owing to the free wheeling system 26, such braking only takes place when bar 14 is moved in the direction of the arrow, while when the clutch is released, the shock absorber is non-operative, and the releasing movement will therefor take place at an undiminished velocity.

Control of the electric current which causes the disengaging movement of the clutch, is, in the type as shown in Fig. 2, effected in another manner than in the embodiment shown in Fig. 1, namely, not through a relay, but by means of a centrifugal governor 23 driven by the engine of the vehicle. If the speed of the motor is low, a conducting connection is set up at 23 between the controls of the governor and a contact 24. Thereby, this contact is conductively connected with the bulk of the vehicle, and also one pole of the electromotor. The other pole is connected, at +B to the storage battery, so that the motor is started. At a higher speed of the engine of the vehicle the conducting connection is interrupted, at 25, and the clutch is let in. Switch 30 serves the same purpose as switch 12 of Fig. 1.

In Fig. 3, a third type of control member for the electric current is illustrated, which serves to disengage the clutch. In this case, partial vacuum is used for controling purposes, and the vacuum may be taken from the suction pipe of the automobile driving engine.

31 is a casing closed by a membrane 32 and whose interior is connected with the suction pipe of the engine, so that, when the said engine is operative, there is, in the casing, a vacuum which will move the membrane inward. On the membrane is arranged a contact pin 33 facing another contact pin 34 which, due to a screw thread, is adjustable within a fixed base 35, to which the thread is conductively connected. From the battery 36 of the car, the electric line 37 is led to an electromotor M which corresponds to motor 21 of Fig. 2 or to a magnet which corresponds to magnet 4 of Fig. 1 or another suitable device adapted to electrically effect disengagement of the clutch. From the motor M, the line 38 is led to base 35, and the other pole of the battery 36 is connected with the bulk of the vehicle. At a very low speed or stillstand of the vehicle, the vacuum in the suction line is either very little or nought, so that a conductive connection between the contact pins 33 and 34 is effected. Thus the electric current will cause the clutch to be disengaged. At a relatively high speed of the engine of the vehicle, the current between the contact pins 33 and 34 is interrupted and the clutch let in. As an auxiliary switch, in the manner of switches 12 and 30 in Figs. 1 and 2, serves in this case a contact made between a disc 39 and a contact pin 40, when the foot 41 has been sufficiently removed from the gas pedal 43. The disc 39 is mounted on a bolt 43, which ends in a plate 44. This plate 44 must be depressed by the foot before the latter touches plate 45 of the gas pedal, if the engine of the vehicle is to be started. Thereby the contact between 39 and 40 is interrupted, so that engagement of the coupling will be initiated before the engine of the vehicle has reached so high a speed that the pressure below atmospheric could let in the clutch. On the other hand, when the vehicle is descending, the clutch is released, when the foot is lifted from plate 40.

RUDOLF FUCHS.