H. A. LEACH.

COMBINATION VALVE CONTROL.

APPLICATION FILED FEB. 8, 1917.

1,248,683.

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Fig. 1.

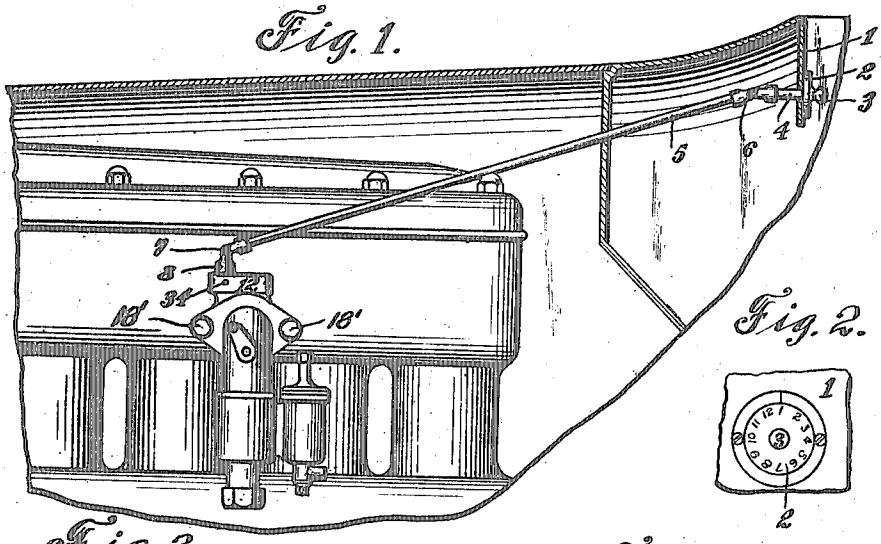


Fig. 2.

Fig. 3.

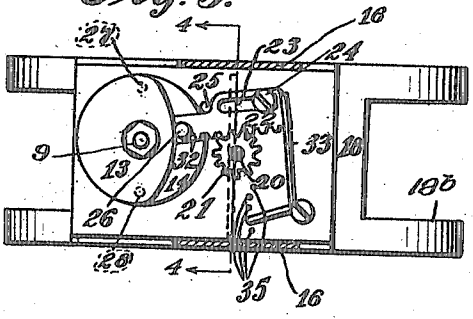


Fig. 4.

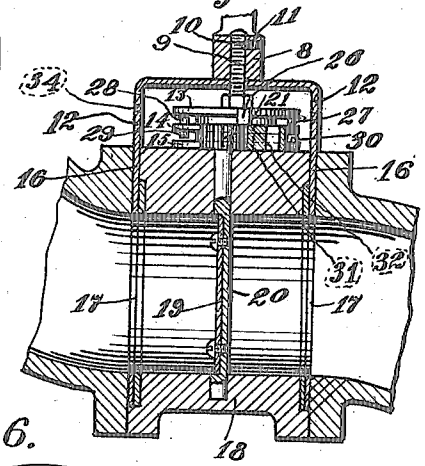


Fig. 5.

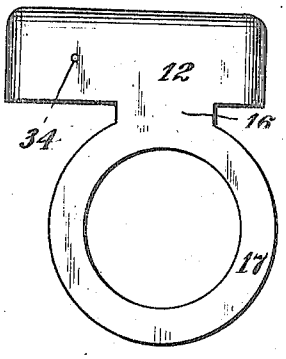
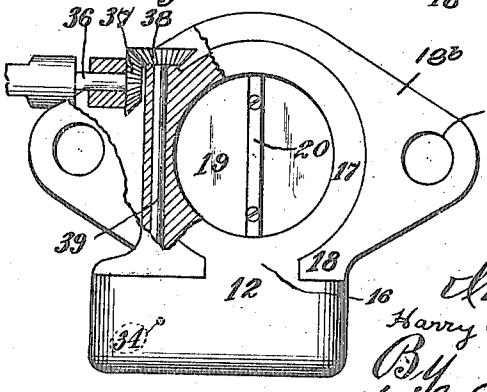


Fig. 6.



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UNITED STATES PATENT OFFICE.

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COMBINATION VALVE CONTROL.

1,243,683. Specification of Letters Patent. Patented Dec. 4, 1917.

Application filed February 8, 1917. Serial No. 147,343.

To all whom it may concern:

Be it known that I, HARRY A. LEACH, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Combination Valve Controls, of which the following is a specification.

This invention applies the principle of a combination lock such as used in safes, vaults, and the like to prevent the operation of internal combustion engines, and provides means therefor. It is intended especially to prevent theft, misappropriation, or misuse of motor vehicles and boats, aeroplanes, and the like.

In the accompanying drawings forming part of this specification and in which like numbers of reference denote like parts wherever they occur,

Figure 1 is a fragmentary side elevation of an internal combustion engine showing the improved lock associated therewith;

Fig. 2 is a detail, showing the combination dial on the instrument board of an automobile or the like;

Fig. 3 is a plan view of the valve-actuating mechanism with the valve indicated in open position;

Fig. 4 is a sectional view upon line 4—4 of Fig. 3, but with the valve in closed position.

Fig. 5 is a detail, showing means of attachment to the manifold; and

Fig. 6 is an alternative form of means for operating the tumblers.

Upon the instrument board 1 or at any other convenient or suitable place is mounted the combination dial 2, which is revoluble in both directions alternately by means of the knob 3, as is common in such construction when used in safes and the like.

The pintle 4 rotates with the dial plate 2, and is connected to pitman 5 by the universal joint 6. At the opposite end, pitman 5 is connected by universal joint 7 to cap 8, which is internally threaded so as to be adapted rotatably to actuate the threaded tumbler-stem 9. The notch or recess or flat place 10 and screw 11 seating therein or thereon prevent back rotation of cap 8 independent of stem 9. A suitable flexible shaft (not shown in the drawings) may be used instead of the pitman 5 and universal joints 6 and 7.

Casing 12 protects the tumblers 13, 14, and 15 and connected parts, the stem 9 to which the tumbler 13 is fixed and upon which tumblers 14 and 15 are loosely mounted projecting outwardly through a hole in casing 12. Arms 16 depend or extend from casing 12 and bear flat rings 17 or the like adapted to encircle the bore of the manifold pipe and the bore of the carbureter exit at the point where they respectively join the union or collar 18 at the intake manifold. The arrangement is the same if located at the exhaust manifold, as may be done. If located at the intake manifold the admission of gas from the carbureter is controlled by butterfly valve 19; if located at the exhaust manifold, the butterfly valve 19 controls the exhaust of the products of combustion. It will be understood that the union is secured in position in a usual and well known way by means of bolts 18′, see Fig. 1, which bolts pass through openings 18^a formed in ears 18^b of the union and engage corresponding portions of the manifold. It is to be noted that the structure herein shown and described is adapted to be put upon the market as an article of manufacture. In other words, the valve 19 and the actuating mechanism therefor are all bodily carried by the union 18, which union is adapted to be inserted in the intake or exhaust line of a motor with the valve and its actuating mechanism already mounted in assembled relation upon said union. This obviates the necessity of making extensive changes in the intake or exhaust line of the engine upon which it is used.

It is further to be noted that the rings 17 (see Fig. 5) do not encircle the outside of the intake or exhaust pipe but that upon the contrary they lie between the union 18 and the adjacent parts of the intake or exhaust conduit whereby the act of placing the union in position within the intake or exhaust line serves to secure the casing 12 in position in such manner as to render it impossible for a thief to easily remove the casing and tamper with the mechanism of the lock.

The valve 19 is mounted upon, or actuated by, shaft 20, which is rotatable in either direction by the spur pinion 21 through the engagement of the latter with the rack 22. The rack 22 is slotted at 23. By means of the slot 23 and screw 24 passing therethrough and into the top of union 18 the rack 22 is held in engagement with

pinion 21. Pin 25 acts as a guide for the rack-bearing member, which at its forward end is provided with a pin or rounded head 26, against which cam tumbler 13 is adapted to impinge. The said tumbler 13 may either have a double cam, as shown in the drawings, or a single cam.

Depending from tumbler 13 is a stud 27, which is adapted, when tumbler 13 has been rotated the proper degree, to impinge against and push upon stud 28, which projects upwardly from tumbler 14. Stud 29 depends from tumbler 14, and is adapted to impinge against and push upon stud 30 projecting upwardly from tumbler 15.

Tumbler 15 is slotted or notched at 31 to allow the entrance into the said slot or notch of the forward end or head of the rack member bearing the rounded pin or part 26, but the same can not enter into the said slot 31 unless tumbler 14 is simultaneously set with its slot or notch 32 in vertical registration or alinement with the said slot 31.

Any suitable spring 33 exercises constant pressure upon the said rack member to force it into slots 31 and 32 in tumblers 15 and 14 whenever the said tumblers are so set as to open slots 31 and 32 opposite the said rack member.

The rack member is normally seated within slots 31 and 32, which holds valve 19 open for the passage of gas. When it is desired to lock the engine, the combination dial is suitably worked, whereby cam tumbler 13 is revolved and pushes the rack member out of slots 31 and 32, and its further revolution in the same direction results by the engagement of the various studs 27, 28, 29, and 30 in moving the slots 31 and 32 out of alinement with the path of inward travel of the said rack member, and such alinement can not be restored without suitably working the permutation tumblers 13, 14, and 15 by means of the dial 2 by some one who knows the combination. When the rack member is pushed out of the slots 31 and 32 as above set forth the valve 19^a is moved to the position illustrated in Fig. 4 and in which position the butterfly valve lies across the bore of the union 18 to shut off the passage of fuel to the engine.

In case it is necessary to disassemble the device, and for that purpose it becomes necessary to screw cap 8 off stem 9 after removal of screw 11, backward rotation of cap 8 in the unscrewing movement would generally merely cause rotation of stem 9. To prevent this, pin-hole 34 allows the insertion of a pin that will press against tumbler 13, or, if lower, either of the other tumblers 14 or 15, so as to hold stem 9 from rotation and allow detachment of cap 8.

The series of holes 35 in one of which one end of spring 33 is socketed permit of adjustment of the tension of the said spring 33.

Automobile designs vary, and for this reason it may in some cases be possible to actuate valve 19 by a direct shaft 36 and beveled pinion 37 and beveled gear 38, as shown in Fig. 6, in which arrangement shaft 39 takes the place of stem 9 in the other figures of the drawings. Fig. 6 is intended to indicate, also, the other changes in arrangement of the device where the automobile design requires or permits a direct shaft 36 being run from the instrument board 1.

Having thus described this invention, I hereby reserve the benefit of all changes in form, arrangement, order, or use of parts, as it is evident that many minor changes may be made therein without departing from the spirit of this invention.

I claim:

1. In a device of the character described, a valve, tumbler mechanism for controlling the same, a stem upon which the said tumbler mechanism is mounted and with which the same rotates, a casing inclosing the said tumbler mechanism, and a cap screw-threadedly connected with the said stem and adapted to be removed therefrom by backward rotation, there being a pin-hole in the said casing to allow the insertion of a member within the casing to engage and hold the stem against rotation during the removal of the cap.

2. In a device of the character described, a valve-carrying member disposed in a conduit, a lock mechanism controlling said valve, and a casing inclosing the lock mechanism having projections to hold the same in place, which projections are clamped between the valve-carrying member and a portion of the conduit.

3. In a device of the character described, a valve-carrying element adapted to be located in a conduit, a lock mechanism carried thereby, and a casing for the lock mechanism, said casing having ring-like projections to hold the same in place, which projections lie between the valve-carrying member and a portion of the conduit and encircle the bore of the conduit.

4. In a device of the character described, a union adapted to be inserted in a conduit, a tumbler mechanism carried thereby, a casing inclosing the tumbler mechanism, and annular projections carried by the casing, the openings through which register with the bore of the union and which projections are adapted to be clamped between the union and adjacent portions of the conduit.

5. In a device of the character described, the combination with a valve comprising a rotative stem, of a pinion carried thereby, a rack mounted for endwise movement, the teeth of which engage said pinion, and a tumbler mechanism for controlling and actuating said rack, said tumbler mechanism comprising a cam and means carried by the

rack which engage with said cam, said tumbler mechanism comprising recessed portions and said rack having portions adapted to enter said recessed portions when the latter are in registry.

6. In a device of the character described, the combination with a valve comprising a rotative stem, of a pinion carried thereby, a rack mounted for endwise movement, the teeth of which engage said pinion, and a tumbler mechanism for controlling and actuating said rack, said tumbler mechanism comprising a cam and means carried by the rack which engage with said cam, said tumbler mechanism comprising recessed portions and said rack having portions adapted to enter the recessed portions when the latter are in registry, and spring means bearing upon said rack and normally tending to impart endwise movement to the same toward the tumbler mechanism.

In testimony whereof I hereunto affix my signature.

HARRY A. LEACH.