G. W. COUTTS.

PERMUTATION LOCK FOR THE FUEL SUPPLY LINES OF INTERNAL COMBUSTION ENGINES.

APPLICATION FILED OCT. 10, 1919.

1,408,932. Patented Mar. 7, 1922.

Fig. 1.

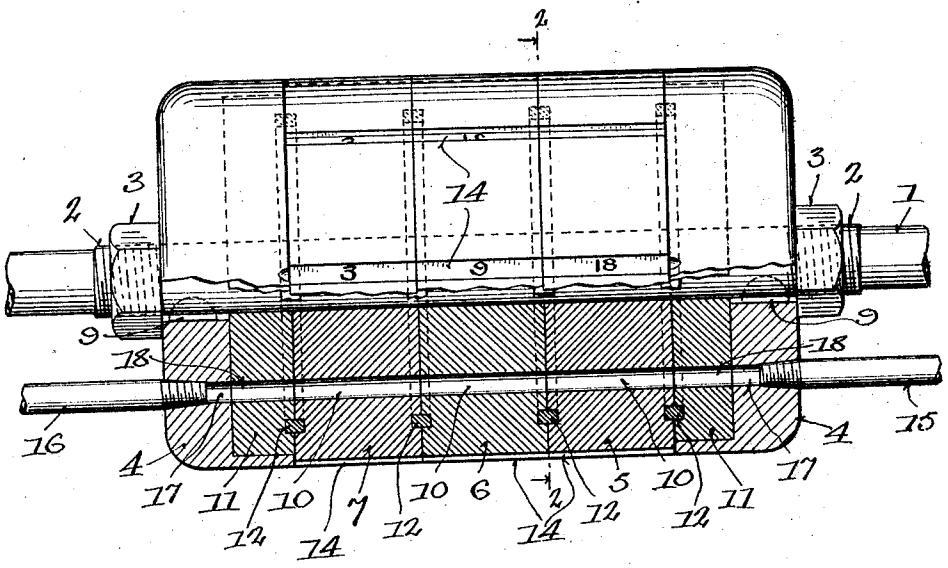
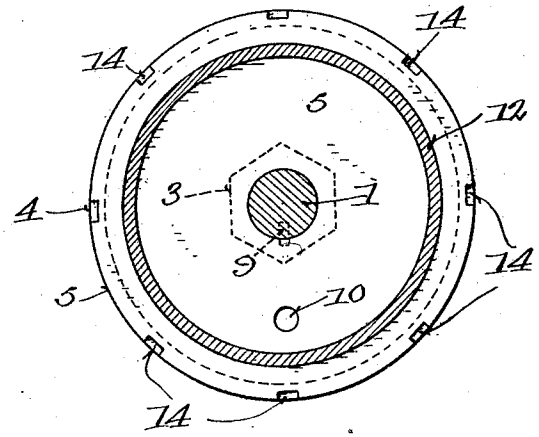


Fig. 2.



Inventor
George W. Coutts
By Edwin & Wheeler
Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE W. COUTTS, OF WAUKESHA, WISCONSIN.

PERMUTATION LOCK FOR THE FUEL-SUPPLY LINES OF INTERNAL-COMBUSTION ENGINES.

1,408,932. Specification of Letters Patent. Patented Mar. 7, 1922.

Application filed October 10, 1919. Serial No. 329,727.

To all whom it may concern:

Be it known that GEORGE W. COUTTS, citizen of the United States, residing at Waukesha, county of Waukesha, and State of Wisconsin, have invented new and useful Improvements in Permutation Locks for the Fuel-Supply Lines of Internal-Combustion Engines, of which the following is a specification.

My invention relates to improvements in permutation locks for the fuel supply lines of internal combustion engines.

The object of my invention is to provide a form of lock having adjustable members rotatable about a central axis and each provided with a duct parallel with the axis but radially distant therefrom and adapted in one position to form a portion of the fuel supply duct leading to the engine and its carbureter. Each of said rotatable members is provided with a similar duct or passage and it is necessary for all of the members to be adjusted with such ducts or passages in alignment with each other and with the connecting supply and delivery pipes before fuel can be delivered to the engine.

Each rotatable member is preferably in the form of a ring or circular disk provided with a set of index characters to facilitate adjustment of the members by the person or persons who are informed as to the combination of characters required for opening the fuel supply line.

A further object of my invention is to provide a permutation fuel duct lock adapted to be interposed in a set of fuel supply duct elements without permitting leakage of fuel from between the adjustable members.

In the drawings:

Figure 1 is a side elevation partly in section, of a permutation lock embodying my invention, the adjustable members being shown with the fuel duct exposed and in position for a fuel delivery.

Figure 2 is a sectional view drawn on line 2—2 of Figure 1.

Like parts are identified by the same reference characters in both views.

The supporting shaft or rod 1 is slightly enlarged and threaded at 2 to receive nuts 3 adapted to engage a set of metal clamping heads 4.

Between these clamping heads, a set of disks 5 6 and 7 are provided, these disks being rotatably mounted upon the shaft or rod 1 whereby the head caps 4 are keyed to the rod 1 as indicated at 9. Each of the disks 5 6 and 7 are provided with not only a central aperture for the rod or shaft 1, but are also provided with a fuel duct 10 radially distant from the shaft, preferably parallel thereto.

Each of the cap members 4 is provided with a socket in its inner face to which is closely fitted a disk 11, preferably formed of material similar to that composing the disks 5 6 and 7, all of which disks may be formed of any suitable material, adapted, when clamped together, to prevent leakage of hydrocarbon from the ducts 10 to the exterior along the opposing faces of these members.

Disks of vulcanized rubberized fiber provided with packing rings 12 seated in annular channels in their opposing faces will be found satisfactory. The packing rings encircle the central shaft or rod 1 and the ducts 10.

The peripheries of the disks 5 6 and 7 are provided with longitudinal channels 14, at the bases of which numbers or other index characters are provided as indicated in Figure 1.

Fuel supply pipes 15 and 16 are secured in apertures 17 in the caps 4, these apertures being in position for registry with apertures 18 in the relatively stationary disks 11 and in position for alignment with the ducts 10 in the members 5 6 and 7.

When the ducts 10 are all in registry or alignment with each other and with the ports 17 in the respective end caps 4, liquid fuel may pass longitudinally through the lock from the pipe or duct 15 to the pipe or duct 16 and thence to the engine or its carbureter. In the construction shown, this will occur when the peripheral index member is in a line extending from left to right as shown in Figure 1.

But if any one of the disks 5 6 or 7 is rotated out of the illustrated position sufficiently to carry its duct 10 out of alignment with the ducts in the other disks and in the end caps, then the fuel supply will be cut off. By placing the index numbers in channels, exact alignment can be obtained very easily, such exact alignment being secured when the side walls of the channels are aligned. By employing clamping nuts 3 the pressure of the disks upon each other may

be regulated in such a manner as to secure sufficient pressure to prevent leakage past the packing rings without causing such excessive friction as to make it difficult to adjust the rings.

I claim:—

1. A permutation lock for the fuel ducts of internal combustion engines, comprising the combination of a set of rotatable members having contacting faces, an axial support common to all of said members, means for clamping said members together in liquid tight relation to each other, fuel supply and delivery connections for said members, each member being provided with an aperture at one side of the axis, adapted in one position of member adjustment, to register with similar apertures in the adjacent members to form a continuous passage from the supply connection to the delivery connection, and a set of packing rings independent of said rotatable members interposed between said exterior to the space occupied by the aperture.

2. The combination with a supporting shaft having clamping nuts threaded thereon, a set of disks rotatably mounted on the shaft between the said clamping nuts, and each provided with an aperture between the shaft and its periphery, adapted for registry with corresponding apertures in adjacent disks when each of the disks is rotatably adjusted for such registry, and inlet and outlet connections for the set of disks adapted to deliver fluid through the registering apertures when all of the disks are adjusted with their apertures in a position to form a continuous passage from the inlet to the outlet connection, the series of disks being provided with relatively stationary end caps adapted to be placed against the disks by said clamping nuts and rigidly held by said shaft.

3. The combination with a supporting shaft having clamping nuts threaded thereon, a set of disks rotatably mounted on the shaft between the said clamping nuts, and each provided with an aperture between the shaft and its periphery, adapted for registry with corresponding apertures in adjacent disks when each of the disks is rotatably adjusted for such registry, and inlet and outlet connections for the set of disks adapted to deliver fluid through the registering apertures when all of the disks are adjusted with their apertures in a position to form a continuous passage from the inlet to the outlet connection, the series of disks being provided with relatively stationary end caps keyed to said shaft adapted to be placed against the disks by said clamping nuts, and suitably ported to receive the inlet and outlet connections and allow passage of fluid therethrough to and from the disk apertures.

4. The combination with a supporting shaft having clamping nuts threaded thereon, a set of disks rotatably mounted on the shaft between the said clamping nuts, and each provided with an aperture between the shaft and its periphery, adapted for registry with corresponding apertures in adjacent disks when each of the disks is rotatably adjusted for such registry, and inlet and outlet connections for the set of disks adapted to deliver fluid through the registering apertures when all of the disks are adjusted with their apertures in a position to form a continuous passage from the inlet to the outlet connection, each of said disks being formed of impervious fibrous material, and said supporting shaft being provided with metallic end caps for the disks, ported to receive the inlet and outlet connections and anchored against rotation upon the shaft, said caps being adapted for pressure engagement with the disks, and provided with non-rotatable packing disks, socketed in their inner faces.

5. The combination with a supporting shaft having clamping nuts threaded thereon, a set of disks rotatably mounted on the shaft between the said clamping nuts, and each provided with an aperture between the shaft and its periphery, adapted for registry with corresponding apertures in adjacent disks when each of the disks is rotatably adjusted for such registry, and inlet and outlet connections for the set of disks adapted to deliver fluid through the registering apertures when all of the disks are adjusted with their apertures in a position to form a continuous passage from the inlet to the outlet connection, each of said disks being formed of impervious fibrous material, and said supporting shaft being provided with metallic end caps for the disks, ported to receive the inlet and outlet connections and anchored against rotation upon the shaft, said caps being adapted for pressure engagement with the disks, and provided with non-rotatable packing disks, socketed in their inner faces, and all of said disks having annular channels in their opposing faces between their apertures and their peripheries and provided with packing rings seated in said channels.

In testimony whereof I affix my signature in the presence of two witnesses.

GEORGE W. COUTTS.

Witnesses:

LEVERETT C. WHEELER,

O. C. WEBER.