C. W. NICKERSON.

AUTOMOBILE LOCK.

APPLICATION FILED MAR. 4, 1918.

**1,336,650.**

Patented Apr. 13, 1920.

2 SHEETS—SHEET 1.

*Fig. 1.*

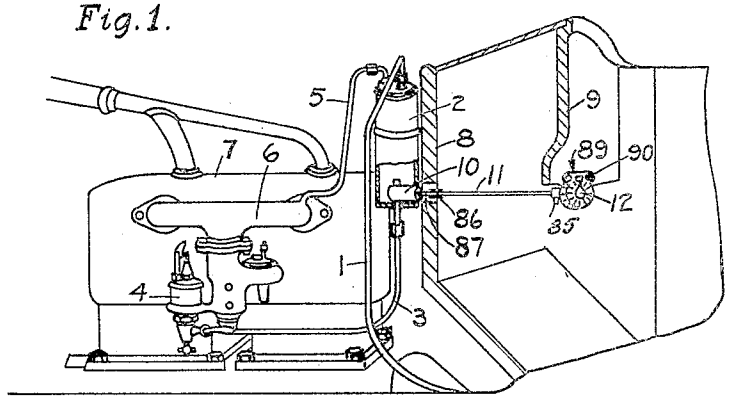



*Fig. 2.*

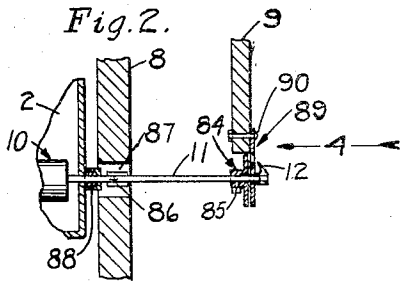



*Fig. 3.*

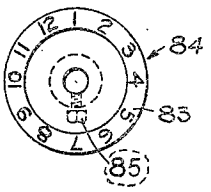



*Fig. 4.*

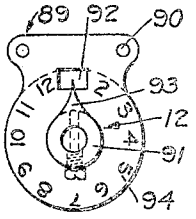



*Fig. 5.*

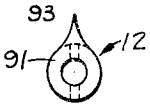



*Fig. 6.*

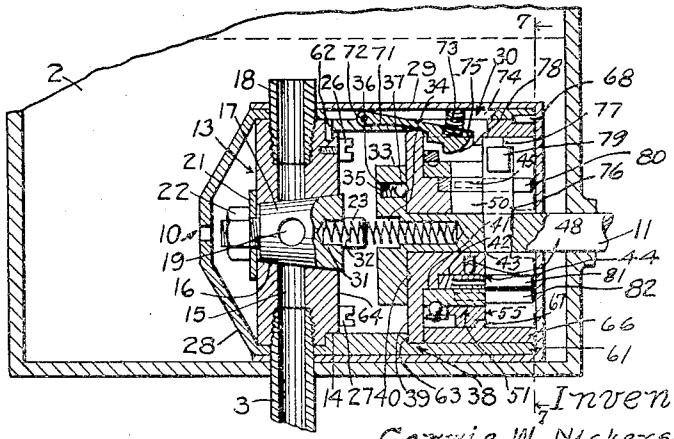
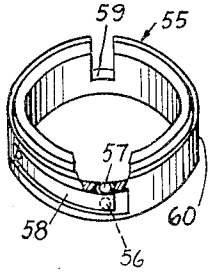



*Fig. 13.*




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Fig. 7.

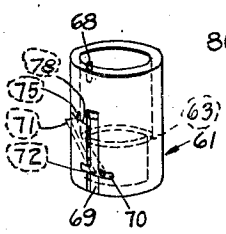



Fig. 8.

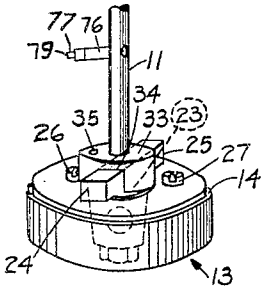



Fig. 14

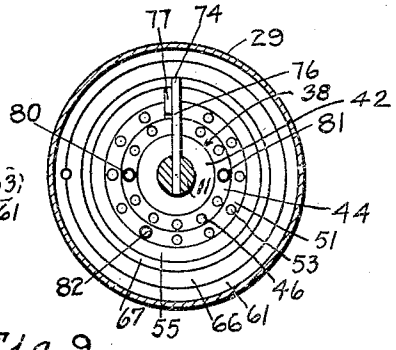



Fig. 9.

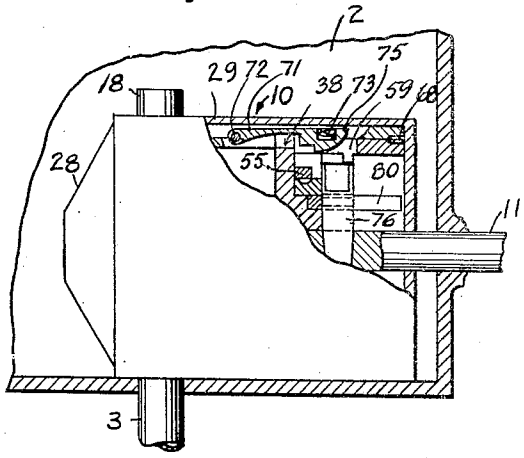



Fig. 10.

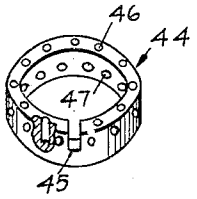



Fig. 11.

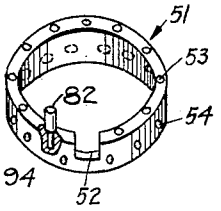
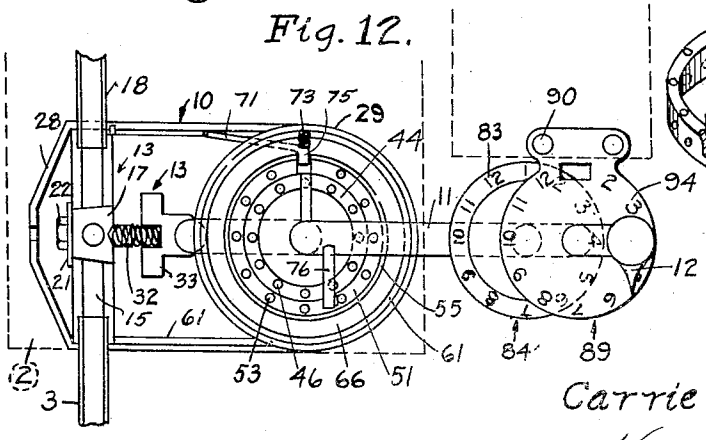



Fig. 12.




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# UNITED STATES PATENT OFFICE.

CARRIE W. NICKERSON, OF LOS ANGELES, CALIFORNIA.

## AUTOMOBILE-LOCK.

1,336,650. Specification of Letters Patent. Patented Apr. 13, 1920.

Application filed March 4, 1918. Serial No. 220,233.

*To all whom it may concern:*

Be it known that I, CARRIE W. NICKERSON, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Automobile-Locks, of which the following is a specification.

My object is to make an automobile lock which may be submerged in the motor fuel in a Stewart vacuum gasolene system or the like, to control the flow of motor fuel and which may be operated from the instrument board.

Figure 1 is a fragmentary perspective partly in section showing an automobile engine and motor fuel line with a lock embodying the principles of my invention submerged in the vacuum tank of the motor fuel line and controlled from the instrument board.

Fig. 2 is a fragmentary sectional detail through the instrument board and dash board and showing the connection between the operating handle and lock.

Fig. 3 is an elevation of the dial.

Fig. 4 is an elevation of the cap for covering the dial, the operating handle, and the indicating means, as seen looking in the direction indicated by the arrow 4 in Fig. 2.

Fig. 5 is an elevation of the operating handle pointer shown in Fig. 4.

Fig. 6 is a vertical central sectional detail of the lock mounted in the vacuum tank ready for use.

Fig. 7 is a vertical cross-section through the lock on the line 7—7 of Fig. 6.

Fig. 8 is a perspective of the valve head and lock control operating stem.

Fig. 9 is a view analogous to Fig. 6 with the parts operated to different positions.

Fig. 10 is a perspective of the inner combination tumbler.

Fig. 11 is a perspective of the outer combination tumbler.

Fig. 12 is a diagrammatic view of the operating parts.

Fig. 13 is a perspective of the tumbler seat ring.

Fig. 14 is a perspective of the outer rigid tumbler casing.

Referring to Fig. 1, the pipe 1 leads from the motor fuel storage tank (not shown) to the vacuum tank 2, the pipe 3 leads from the bottom of the vacuum tank 2 to the carbureter 4, and the vacuum pipe 5 leads from the top of the vacuum tank 2 to the intake manifold 6 of the engine 7. The vacuum tank 2 is mounted upon the front face of the dash board 8 with the bottom of the tank substantially on a level with the bottom of the instrument board 9. The lock 10 is mounted on the bottom of the tank 2 in position to be submerged in the motor fuel and the upper end of the pipe 3 is connected to the lock 10, so that the lock controls the flow of motor fuel from the tank 2 to the pipe 3. The lock 10 is controlled by an operating stem 11 manipulated by a handle pointer mechanism 12. The stem 11 reaches across the space between the instrument board 9 and the dash board 8 and the handle pointer mechanism 12 is upon the exposed face of the instrument board in position convenient to the operator of the automobile.

Referring to Figs. 6 and 8, the valve head 13 is circular in plan, flat in elevation, and has an annular casing seat 14 around its upper corner, and a diametrical bore 15 extends through the head, and an axial valve seat 16 extends through the head crosswise of the bore 15. The stop cock valve plug 17 is mounted in the seat 16. The motor fuel pipe 3 is tapped into one end of the bore 15 and the inlet nipple 18 is tapped into the opposite end of the bore, and the valve plug 17 has a transverse bore 19 adapted to register with the bore 15 and said plug is the usual tapered construction provided with a spring washer 21 and a tightening nut 22. A wrench seat head 23 extends upwardly from the large end of the plug 17 and diametrically across the upper face of the end of the plug, and arms 24 and 25 extend from the ends of the head 23 beyond the periphery of the plug and work loosely against the face of the head 13, there being stop screws 26 and 27 inserted into the head 13 upon diametrically opposite sides of the plug to be engaged by the arms 24 and 25, so that when the wrench seat 23 is engaged by a wrench to rotate the valve, the valve will be stopped one way to bring the opening 19 into registration with the bore 15 to allow the motor fuel to flow and stopped the other way to bring the opening 19 crosswise of the bore 15 to stop the flow of motor fuel.

The head 13 is inserted tightly into a cap 28, said cap bulging around the nut 22 and the pipes 3 and 18 passing through the rim of the cap.

The tumbler housing 29 telescopes over

the rim of the cap 28 and the pipes 3 and 18 also pass through this housing 29. The combination tumbler mechanism 30 is all inclosed within the housing 29 above the valve head 13.

A central bore extends downwardly from the upper face of the head 23 into the plug 17 to form the spring seat 31, and an expansive coil spring 32 is mounted with its lower end in this seat. A wrench head 33 is fixed upon the inner end of the stem 11 and has a square diametrical seat 34 in its lower face to receive the head 23. The wrench head 33 is circular in plan. A spring seat 35 is formed by boring down from the upper face of the head, an expansive coil spring 36 is placed in the seat 35, and a ball 37 is placed in the seat upon the spring 36.

The tumbler base 38 is circular in plan and has a flat lower face 39 having a series of hemispherical recesses 40 corresponding to the numbers upon the dial and in a concentric plane to register with the ball 37, so that the ball forms a yielding catch connection between the wrench head 33 and the tumbler base 38. The tumbler base 38 has a reduced portion 41 and a second reduced portion 42, and the head has a central bore 43 in which the stem 11 fits, the portions 41 and 42 being concentric to the stem.

The inner combination tumbler 44 shown in Fig. 10 comprises an annular ring having a key slot 45 formed radially from one edge and having a series of pin holes 46 formed from the same edge and having a series of radial perforations forming ball seats 47. A spring seat 48 is bored in the periphery of the reduced portion 42 of the tumbler base 38, an expansive coil spring is placed in this spring seat, and a ball 49 is placed in the spring seat against the spring in position to engage in the ball seats 47 to form a yielding catch connection between the inner ring 44 and the tumbler base 38, said ball seats 47 corresponding to the numbers on the dial and the ring fitting closely and rotatably upon the portion 42 of the base 38. A key slot 50 is formed radially from the upper edge of the reduced portion 42 and adapted to register with the key slot 45 in the ring 44.

The outer combination tumbler 51 shown in Fig. 11 is a circular ring adapted to fit closely and rotatably upon the ring 44 and upon the reduced portion 41 of the base 38 and has a radial key slot 52 formed from its upper edge and a series of pin holes 53 formed from the same edge and corresponding to the numbers on the dial and has a series of ball seats 54 in its periphery. The key slot 52 is adapted to register with the key slot 45 in the inner ring and with the key slot 50 in the base 38.

A tumbler seat ring 55 fits closely and slidably upon the outer combination tumbler 51. A ball seat 56 is formed radially through the ring, a ball 57 is placed in the ball seat, and a leaf spring 58 is secured to the outer face of the ring to press the ball inwardly, said ball 57 registering with the ball seats 54 to form a yielding catch connection between the ring 55 and the outer combination tumbler 51. A key slot 59 is formed radially in the ring 55 to register with the slots 52, 45 and 50. An enlargement 60 is formed upon the periphery of the ring 55 intermediate of its ends.

The outer rigid tumbler casing 61 fits upon the seat 14 in the valve head 13 and is held against rotation by a pin 62 inserted into the valve head and engaging in a notch in the edge of the casing 61. The outer or upper end of the casing 61 is enlarged to form a shoulder 63, and the tumbler base 38 fits closely and slidingly within the casing 61 against the shoulder 63, there being room between the adjacent faces 39 of the tumbler base 38, and 64 of the valve head 13, to allow the stem 11 to reciprocate to bring the wrench 33 into and out of engagement with the head 23, and a bore is formed centrally from the lower face of the wrench 33 up into the stem 11 to form a seat 65 for the upper end of the spring 32, the tension of said spring 32 being exerted to hold the wrench disconnected from the valve.

The inner rigid tumbler casing 66 fits tightly in the outer end of the casing 61 and fits closely against the enlarged portion of the tumbler base 38 and has an internal flange 67 intermediate of its ends to fit slidably against the enlargement 60 upon the ring 55, and the casing 66 is held against rotation by a pin 68 inserted in a bore formed between the casings 66 and 61.

A longitudinal slot 69 is formed from the lower end of the casing 61, a bearing slot 70 is formed transversely of the lower end of the slot 69, and a latch 71 has a pin 72 through its lower end, said pin fitting in the bearing slot 70 and said latch swinging upon the pin in the slot 69. The housing 29 bears against the outer face of the lower end of the latch 71 and holds the pin 72 in the slot 70. An expansive coil spring 73 is placed with its inner end in a seat formed in the outer side of the head of the latch 71 and the outer end of the spring bears against the inner face of the housing 29, the tension of the spring being exerted to throw the head of the latch inwardly. A slot 74 is formed through the rigid outer tumbler casing 61 in registration with the slot 69 and adapted to register with the slots 59, 45, 52 and 50. When the slots 74 and 59 are in registration, as in Fig. 6, the head 75 of the latch swings inwardly into the slot 59 and holds the tumbler seat ring 55 from rotating.

A key 76 is inserted transversely through the stem 11 in position to swing freely above the tumbler base 38, the inner combination tumbler 44, the outer combination tumbler 51, the tumbler seat ring 55, and the internal flange 67. The slot 74 extends through the internal flange 67 to make a passage-way for the key 76. The outer end of the key fits slidably in the outer end of the inner rigid tumbler casing 66 and when the slot 74 and the key slots 59, 45, 52 and 50 are lined up the key 76 will pass down into the slots and then as soon as the stem 11 is turned either way the flange seat 77 formed at the upper outer corner of the key will engage under the internal flange 67 and hold the same from moving outwardly under the tension of the spring 32.

The upper inner face 78 of the head 75 of the latch 71 is inclined so that when the stem 11 is pushed inwardly the outer end of the key 76 will engage the incline and throw the latch 71 outwardly far enough to release the ring 55 and allow the ring 55 to rotate with the tumblers 44 and 51 and the tumbler base 38. A boss 79 is formed upon the side of the key 76 near its outer end in position to be in the plane of the outer tumbler 51. When the stem 11 is pressed down and the key 76 passes into the key slots the wrench 33 will engage the head 23. and rotation of the stem 11 will open the valve and allow the motor fuel to run.

The key 76 cannot be withdrawn from the key slots in the tumblers except when the valve plug 17 is in closed position and the key in position to pass through the slot 74 in the internal flange 67.

Working the combination consists in manipulating the stem 11 to bring the key slots into alinement so as to receive the key 76. The stem 11 carrying the key 76 will rotate forwardly and backwardly indefinitely until the right combination has been worked to line up the key slots. It is obvious that the valve plug 17 cannot be manipulated until the combination of the lock has been worked out by the manipulation of the stem 11.

The connection between the key 76 and the tumblers 44 and 51 is made by the use of combination pins 80, 81 and 82 loosely inserted in the pin holes 46 and 53, and by manipulating the pins and inserting them into different holes an innumerable number of combinations may be set. The pin holes 46 and 53 are considered as numbered clockwise from the key slots 45 and 52, the key slots counting as number one, and these pin holes are evenly spaced apart and correspond to the numbers 83 around the dial 84. The dial 84 is adjustably mounted upon the stem 11 and held in place by a set-screw 85. The stem 11 has a flexible joint 86 and passes through an opening 87 in the dash board 8 and through a stuffing box 88 in the tank 2. The dial cap 89 is suspended from the instrument board 9 by bolts 90 and the stem 11 passes through a central opening in the dial cap. The operating handle pointer 91 is fixed upon the front end of the stem 11 just in front of the dial cap 89. An indicator opening 92 is formed through the dial cap 89 in position to disclose the numbers 83 upon the dial 84 through the opening, one number at a time, and the point 93 of the handle pointer 91 points to the number appearing through the opening 92. Numbers 94 are placed upon the dial cap 89 reading clockwise, the opening 92 counting as "1."

In the drawings I have shown twelve numbers on the dial and twelve pin holes in each of the tumblers.

Assuming that it is desired to set the combination to read "841," then the pin 82 is set in the eighth hole in the outer combination tumbler 51, the pin 81 is set in the fourth hole in the inner tumbler 44, and the pin 80 is set diametrically opposite the pin 81 in the tumbler 44, and the dial 84 is set with the number "1" opposite the point 93, and the point 93 is in line with the key 76. Then the key 76, being out of the key slots, the stem 11 is rotated one or more turns the reverse of clockwise until the number "8" appears through the opening 92. This will bring the pin 82 to the position shown in Fig. 7 and will bring the slot 52 into registration with the slots 74, 59 and 50. Then the handle pointer 91 is operated clockwise to the number "4" upon the dial cap 89. This will bring the key slot 45 into line with the other slots. Then the handle pointer 91 is operated the reverse of clockwise until the number "1" upon the dial 84 appears through the opening 92 in front of the point 93. This will bring the key 76 into line with the key slots and the combination is worked. Then the handle pointer 91 is operated to press the stem 11 longitudinally toward the lock, thereby moving the key 76 into the key slots and moving the wrench 33 into engagement with the head 23. Then movement of the handle pointer 91 rotatably in either direction will cause the seat 77 of the key 76 to pass under the internal flange 67 and lock the wrench to the valve plug, and continued rotation will rotate the valve plug 17 to bring the opening 19 into registration with the opening 15 and allow the motor fuel to flow from the vacuum tank 2 and the parts are left in this position as long as it is desired to operate the automobile.

When it is desired to lock the automobile so that it cannot be operated by an unauthorized person or a thief, the handle pointer 91 is manipulated to bring the point 93 to a central position in the opening 92,

then the tension of the spring 32 will force the stem 11 outwardly to disconnect the wrench from the valve plug, and this operation will bring the key 76 out of the key slots, and rotation of the handle pointer 91 in either direction will disarrange the combination, thereby leaving the valve plug 17 in its closed position to shut off the flow of motor fuel, and the flow of motor fuel cannot be restored until the combination has been re-worked.

After working out all the combinations possible or desired with two pins in the inner tumbler 44 and one pin in the outer tumbler 51, the two pins may be placed in the outer tumbler and one pin in the inner tumbler and the same number of combinations worked over again.

The boss 79 on the key 76 provides a hook for mismatching the pins of the outer tumbler in relation to the pins of the inner tumbler, so that the key slots 45 and 52 will be mismatched or overlapped.

The reading of each combination may be changed twelve times simply by moving the dial 84 on the stem 11.

A great many changes in the combination may be made by changing the joint 86 to set the point 93 a given number of points out of alinement with the key 76.

The spring catches 37, 49 and 57 will snap from point to point and assist in correctly lining up the parts in working the combination.

The head of the housing 29 will hold the pins 80, 81 and 82 in the tumblers and this head is spaced from the upper faces of the tumblers to provide room for the key 76 to swing above the tumblers.

In describing the parts shown in Fig. 6 I have regarded the right-hand side as the top and the left-hand side as the bottom.

Especial attention is called to the fact that all of the parts relating to the lock enter the vacuum tank and leave the vacuum tank below the operative level of the gasolene in the vacuum tank, so that any mutilation of the lock parts or removal of the parts will let the gasolene out of the vacuum tank and put the gasolene system out of commission.

Especial attention is also called to the fact that the line of flow for the gasolene is vertical when the axis of the lock is horizontal, and that the inlet nipple to the outlet pipe is above the lock, so that when all the gasolene is drained out of the tank that will pass through the inlet nipple still the lock is flooded with gasolene, so that the lock cannot be tampered with without puncturing the tank and letting the gasolene out thereby putting the Stewart system out of use.

Thus I have produced a combination lock adapted to be submerged in the motor fuel in the vacuum tank for controlling the flow of motor fuel from the tank to the carbureter and adapted to be operated from the instrument board.

Various changes may be made in the details of construction without departing from the spirit of my invention as claimed.

I claim:

1. An automobile lock comprising a vacuum tank, a stop cock in the vacuum tank, an outlet pipe leading from the stop cock and from the vacuum tank, a combination lock in the vacuum tank for controlling the stop cock, a stem extending from the combination lock out of the vacuum tank, an operating handle pointer upon the stem, and a dial operatively mounted relative to the pointer, all the parts of the lock being below the operative level of the gasolene.

2. The combination with a vacuum tank containing the operative parts of a vacuum system, of a combination lock mounted in the tank upon the bottom and having a vertical discharge with its inlet opening above the lock and having a valve for controlling the discharge and the operating stem of the lock extending horizontally through the side of the tank.

3. The combination with a Stewart vacuum gasolene system having a vertical tank and an operating mechanism in the top of the tank, of a combination lock mounted in the tank upon the bottom and having a vertical discharge at right angles to a horizontal operating stem, the operating stem extending through the side of the tank and the discharge extending through the bottom of the tank and there being a valve controlled by the lock and for controlling the discharge.

In testimony whereof I have signed my name to this specification.

CARRIE W. NICKERSON.