Dec. 29, 1936. J. TOREN 2,065,839

DOOR LOCKING MEANS

Filed April 19, 1935 3 Sheets-Sheet 1

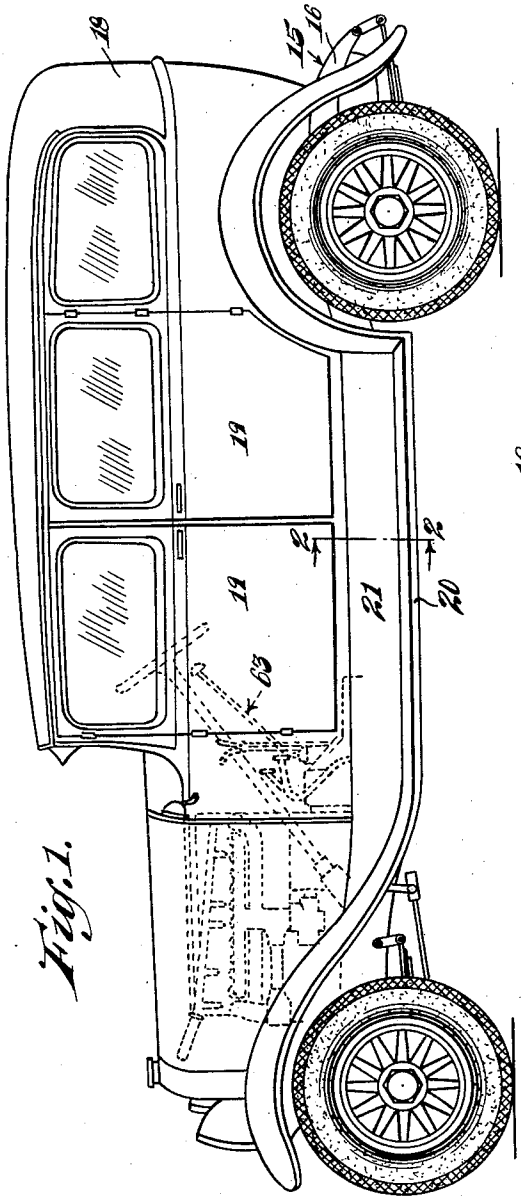


Fig. 1.

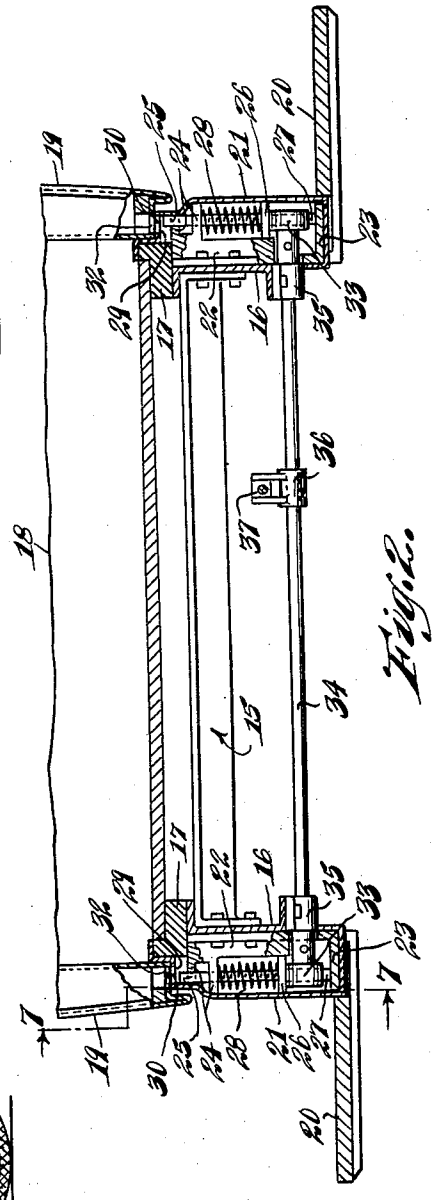


Fig. 2.

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DOOR LOCKING MEANS

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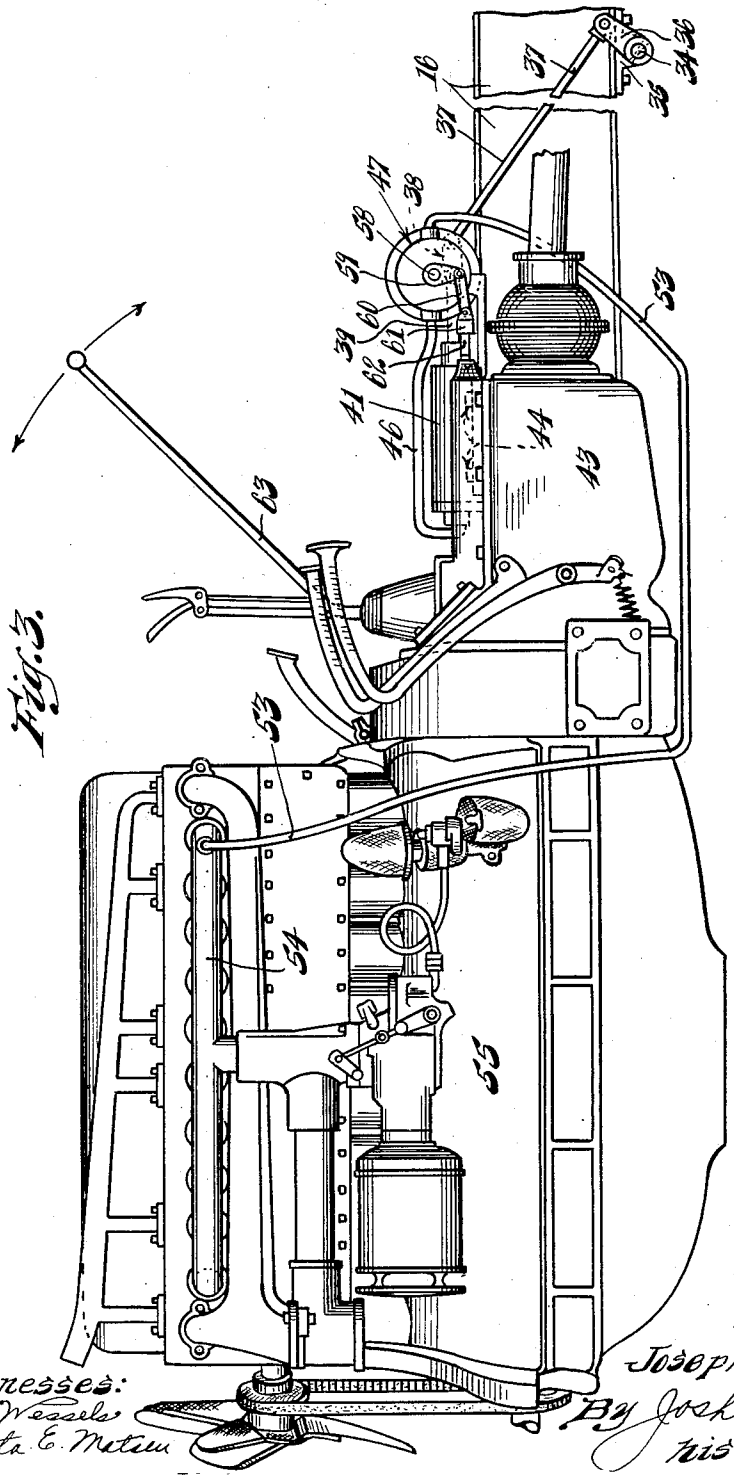


Fig. 3.

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Fig. 4.

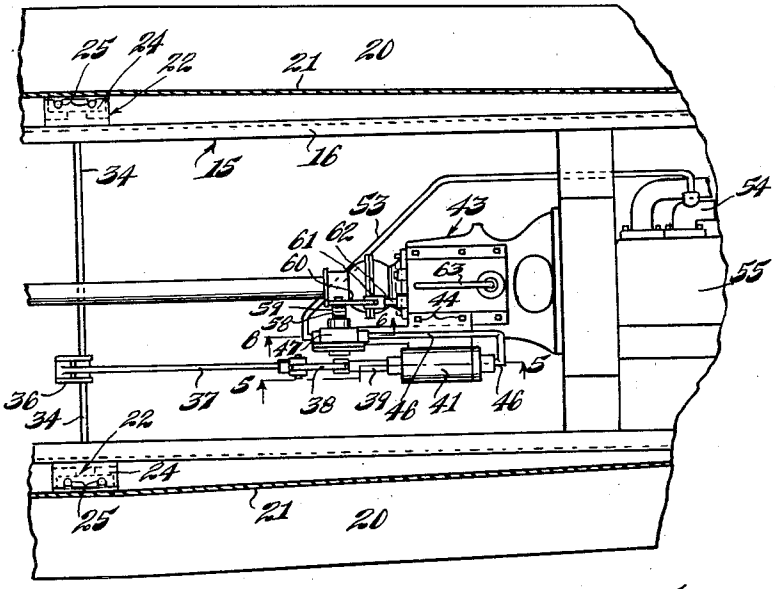


Fig. 5.

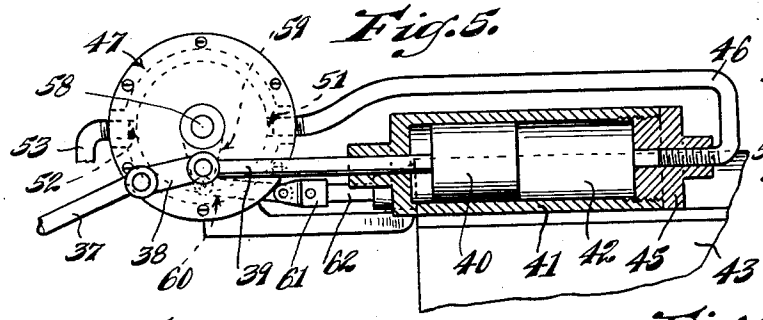


Fig. 6.

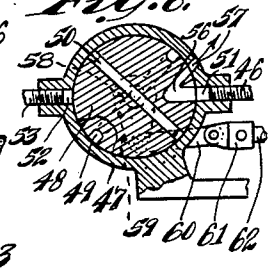


Fig. 7.

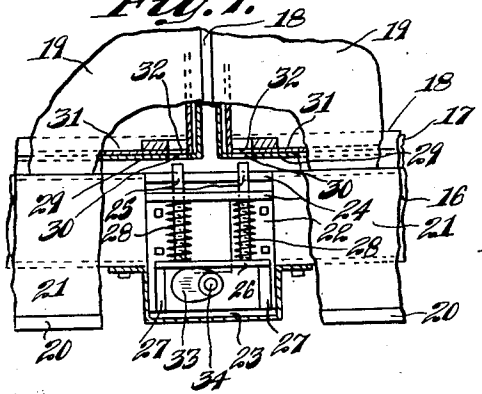
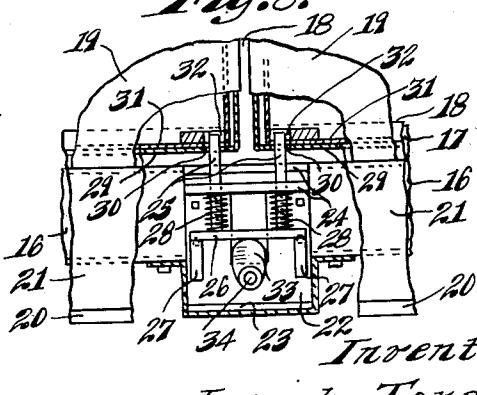


Fig. 8.



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UNITED STATES PATENT OFFICE

2,065,839

DOOR LOCKING MEANS

Joseph Toren, Chicago, Ill.

Application April 19, 1935, Serial No. 17,188

15 Claims. (Cl. 180—82)

My invention relates to automatic door locking means and has particular reference to means for automatically locking automobile doors.

Every one is familiar with the great number of children and even adults who are constantly falling out of opening doors of automobiles to be killed or injured. It is also a fact that a great many door locks have been provided and that all of these have been found to be unsatisfactory for one reason or another.

An object of my invention has been to provide a door lock which will automatically lock the doors of an automobile without any special action on the part of anybody to lock the doors. I have illustrated means whereby the moment a car moves into second and third speeds the doors are automatically locked merely by the act of moving into second and third speeds. The said means could be illustrated as applying to first and reverse speeds just as easily, but I have concluded that in practice there is no need for locking the doors in first and reverse speeds as these speeds are infrequently used and the danger from a fall out of a car at those speeds is not of sufficient practical importance to warrant the illustration of my means to those speeds. In carrying out my means I have operatively connected a valve to the gear shift lever, which valve in the movement of the lever for second and third speeds is moved to a position where it communicates with the intake and operates the locking means, as will be more manifest hereinafter. In the form shown in neutral, first, and reverse speeds, no vacuum is exerted and the locking device is in unlocking condition.

Another object of my invention is to provide a device of the kind described which will be not only practical but reasonable in cost of manufacture.

These and other objects will appear more fully hereinafter.

My invention may be best understood by reference to the following specification and drawings, forming a part of this specification, and in which:

Fig. 1 is a side elevation of an automobile;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1, illustrating part of the chassis and showing part of the structure of my invention applied;

Fig. 3 is an elevational view of the gear shifting means and engine means with my invention shown applied;

Fig. 4 is a plan view of part of the structure with my invention applied;

Fig. 5 is a view partly in section and partly in elevation, taken on the line 5—5 of Fig. 4, illustrating plunger and valve means;

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 4, illustrating the valve means;

Fig. 7 is a view partly in elevation and partly in section, taken on the line 7—7 of Fig. 2, illustrating the doors in unlocked condition; and

Fig. 8 is a view similar to that of Fig. 7, showing the doors in locked condition.

Referring to the drawings, the preferred form of my invention which has been chosen to illustrate the principle thereof and its application is shown applied to a common chassis frame 15, having the usual channel sides 16. Mounted on the top of each of the upper flanges of the channel members 16 is a sill 17 supporting the usual body 18 provided with hinged doors 19. The car in the form shown is what is called a four-door sedan type with the two doors on each side opening away from the center post. It will be understood, however, from the foregoing that my invention is applicable to two-door cars as well as cars having more doors. Referring particularly to Fig. 2, the car is provided with the usual running boards 20, secured to the channel sides 16. There is also provided the usual side plates 21 secured to the running boards 20 and the body 18, and a supplemental casting 22 provided with a lower flange 23 and a pair of upper flanges 24, which castings 22 are secured by bolts to the channel sides 16. Mounted on each side of the car between the side plates 21 and the castings 22 are a pair of pins 25 so as to reciprocate vertically in apertures in the flanges 24. Each pair of pins 25 is in the form shown integral with a horizontal plate 26 which is shown in the lowermost position in Fig. 7. Each horizontal plate 26 in its lowermost position rests upon a pair of shoe members 27 which limit the downward movement of the horizontal plates 26. A compression spring 28 encircles each pin 25 and is interposed between the plate 26 and the flange 24 and these springs function to normally retain the plates 26 in lowermost position. The threshold 29 of each side plate 21, as particularly shown in Figs. 2, 7, and 8, has a slot 30 and the bottom flange 31 of the casing of each door has a slot 32. A cam 33 is fixed on each end of a shaft 34 by means of a hub and pins, which shaft is mounted in bearings 35 supported on the chassis members 16. As will hereinafter more fully appear, the cam functions on the turning of the shaft 34 to raise the plates 26 and the pins 25 upwardly into the slots 30 and 32, the pins

being depressed out of the slots by means of the springs 28 heretofore mentioned. It will also be seen that the supplemental casting 22 and its flanges provided with apertures act to guide the vertical reciprocation of the pins 25.

The shaft 34 is fixed to one end of an arm 36, as particularly shown in Figs. 2, 3 and 4, the other end of the arm being pivoted to a rod 37 which in turn is pivotally connected to a link 38, clearly shown in Figs. 5 and 4. The link 38 is pivotally connected to a reciprocating piston rod 39 of a piston 40 in a cylinder 41, having a cylinder chamber 42. The cylinder 41 is mounted on a transmission housing 43 by means of bolts 44 as particularly shown in Fig. 4, and one end of the cylinder 41 as shown in Fig. 5, is provided with a cap 45 threaded into the cylinder which cap is threadedly connected to one end of a pipe 46, the other end of which is threaded into a three-way valve casing 47, shown clearly in Figs. 6 and 5, which casing is mounted on cylinder 41. Mounted on the casing 47 is a disk 48 provided with a second speed groove 49 and a third speed groove 50, which grooves 49 and 50, together with the interior of the casing, form ports for the purpose of communicating the vacuum from the intake manifold. The casing 47 is provided with an opening 51 on one side registering with pipe 46 from the cylinder and an opening 52 on the opposite side of the casing 47 communicating with a pipe 53 leading to the intake manifold 54 of the usual engine 55. The disk 48, as shown in Fig. 6, is also provided with what may be designated as a neutral V-shaped groove 56, which V-shaped groove 56 is adapted to move out of and into registry with an exhaust port 57 and the opening 51 in the casing 47.

A pair of bearing studs 58 is integrally connected to the disk 48 and is mounted in the casing 47, and one of said studs extends through the casing 47 and has fixed to it an arm 59 pivoted to a link 60, as shown in Fig. 3, especially. The link 60 is pivoted to a collar 61 fixed to a shifter fork rod 62 which in the form shown is the shifter fork rod for second and third speeds, which shifter fork rod is mounted in the transmission assembly for the three speeds. The shifter fork rod 62 is operably connected to the usual gear shift lever 63.

With respect to the operation and referring first to Fig. 3, when for instance the gear shift lever is moved to second speed, the shifter fork rod for second and third speeds will be moved in a direction opposite to the direction of movement of the gear shift lever 63, to wit, to the left in Fig. 3. The movement of the rod 62 causes the disk 48, as viewed in Fig. 3, to turn in a counterclockwise manner, as seen in Fig. 6, which is a reverse view of the disk from that shown in Fig. 3, with the movement appearing in a clockwise manner. It will be seen that the groove or port 49 will be brought in registry with the openings 51 and 52 in the casing 47. When thus the groove 49 is in registry, as aforesaid, the vacuum will be exerted through the intake manifold through the pipe 53, whence it will be carried through the groove 49 and through the pipe 46 to pull the piston to the right in the form shown in Fig. 5, which will cause the members 39, 38, 37, and 36 to rock the shaft 34 to oscillate the cam in a clockwise manner in the view shown in Fig. 7, which will raise the plate 26 and cause the pins to be inserted in slots 32 in the doors 19 as illustrated in Fig. 8. When the gear shift lever 63 is moved in the opposite direction for third speed the same results will take place, except that the groove 50 will be brought into registry with the openings 50 and 51, instead of the groove 49. Thus it will be seen that in second and third speeds a vacuum will be exerted from the intake manifold to cause the pins 25 to lock the doors 19.

Referring to Fig. 6, this shows the condition of the disk in neutral position. In this position the V-shaped groove 56 is in registry with the exhaust port 57 and the opening 51. In this position of the disk the intake manifold is in communication with atmospheric pressure and no force is exerted and the doors are unlocked. It will be understood that when the gear shift lever is moved, for example, from the second speed back to first, communication is shut off between the piston 40 and the intake manifold, and the piston returns to its other position and changes the position of the associated parts so that the cam 34 is returned to the position shown in Fig. 7, and the springs automatically withdraw the pins 25 from locking engagement with the doors.

It will also be understood that Fig. 6 shows the position of the valve disk in first and reverse speeds as well as in neutral, in all of which cases no vacuum force is exerted.

It will also be understood that the locking means which I have provided will lock the door even though the door is not fully closed. For example, if a door is not completely caught in closing, I have made the slots on the bottom of the door sufficiently wide to be entered by the pins even in a position of not being completely closed.

While I have shown a particular form of valve disk and operative connection and a particular form of locking means and other features, it will be understood that these may be varied without departing from the principle of my invention. While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

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

1. The combination with a motor vehicle having a variable transmission and a gear shift lever, of automatic door locking means comprising a door lock, vacuum means for automatically operating said lock, said means including a vacuum producing element, a gear shift lever actuated valve, and a piston to actuate said door lock adapted to be operated by the vacuum produced by said vacuum producing element and controlled by said valve.

2. In automatic door locking means, a door lock, and vacuum means for automatically operating said lock, said means including a vacuum producing element, a piston adapted to be operated by the vacuum produced by said vacuum producing element, a cam engageable with said lock and operable by said piston and a gear shift lever-operated valve for controlling said vacuum.

3. The combination with a motor vehicle having a variable transmission and a gear shift lever, of automatic door locking means compris-

ing a locking member, and vacuum means for automatically operating said locking member, said means including a vacuum producing element, a cylinder, a pipe connection between the cylinder and the vacuum producing element, a piston in said cylinder to actuate said locking member and adapted to be operated by the vacuum, and a valve in said pipe adapted to be actuated by said gear shift lever.

4. The combination with a motor vehicle having a variable transmission and a gear shift lever, of automatic door locking means comprising a locking member, and means for automatically operating said locking member, said means including a vacuum producing element, a cylinder, a pipe connection between the cylinder and the vacuum producing element, a piston in said cylinder to actuate said locking member and adapted to be operated by the vacuum, and a gear shift lever operated valve for controlling the communication of the vacuum to said piston.

5. The combination with a motor vehicle having a variable transmission and a gear shift lever, of automatic door locking means comprising, a locking member, and vacuum means for operating said locking member, said means being operatively connected to and controlled by the gear shift lever.

6. The combination with a motor vehicle having a variable transmission and a gear shift lever, of automatic door locking means comprising, a locking member, and means for operating said door locking member, said means including a vacuum producing element, and said gear shift lever controlling the application of the vacuum produced by said vacuum producing element for operating said lock operating member.

7. The combination with an automobile having an engine and transmission, a gear shift lever for said transmission and a door, of a lock member for said door, a source of fluid pressure, fluid actuated operating means for said lock, and fluid control means actuated by said gear shift lever to actuate said lock operating means.

8. The combination with an automobile having an engine and transmission, a gear shift lever for said transmission and a door, of a fluid pressure differential created by said engine, door locking means actuated by said fluid pressure, and means actuated by said gear shift lever to control the application of said pressure differential for operating the door locking means.

9. The combination with an automobile having an engine and transmission, a gear shift lever for said transmission and a door, of a fluid pressure differential created by said engine, door locking means actuated by said fluid pressure, and means actuated by said gear shift lever and engine to control the application of said pressure differential for operating the door locking means.

10. The combination with an automobile having an engine and transmission, a gear shift lever for said transmission and a door, of a fluid pressure differential created by said engine, door locking and unlocking means actuated by said fluid pressure, and means actuated by said gear shift lever and engine to control the application of said pressure differential for operating the door locking means.

11. The combination with an automobile having an engine and transmission, a gear shift lever for said transmission and a door, of a fluid pressure differential created by said engine, door locking means actuated by said fluid pressure, and means operated by the gear shift lever when actuated into running position to control the application of said pressure differential to lock the door.

12. The combination with an automobile having an engine and transmission, a gear shift lever for said transmission and a door, of a fluid pressure differential created by said engine, door locking means actuated by said fluid pressure, and means operated by the gear shift lever when actuated from a running to neutral position to control the application of said pressure differential to unlock said door.

13. The combination with an automobile having an engine and transmission, a gear shift lever for said transmission, and a door, of a fluid pressure differential created by said engine, door locking means actuated by said fluid pressure, and means operable by the gear shift lever when actuated into a selected one of its running positions to control the application of said pressure differential to lock said door.

14. The combination with an automobile having an engine and transmission, a gear shift lever for said transmission, and a door, of a fluid pressure differential created by said engine, door locking means actuated by said fluid pressure, and means operable by the gear shift lever when actuated into a selected one of its running positions to control the application of said pressure differential to lock said door and when actuated from a running to neutral position to control the application of said pressure differential to unlock said door.

15. In automatic door locking means, a locking member, and means for automatically operating said locking member, said means including a vacuum producing element, a cylinder, a pipe connection between the cylinder and the vacuum producing element, a valve in said pipe, a lever adapted to actuate said valve, a piston in the cylinder adapted to be operated by the vacuum, a rod adapted to be oscillated by said piston, and a cam connected to said rod adapted to operate said locking member.

JOSEPH TOREN.