

May 12, 1931.

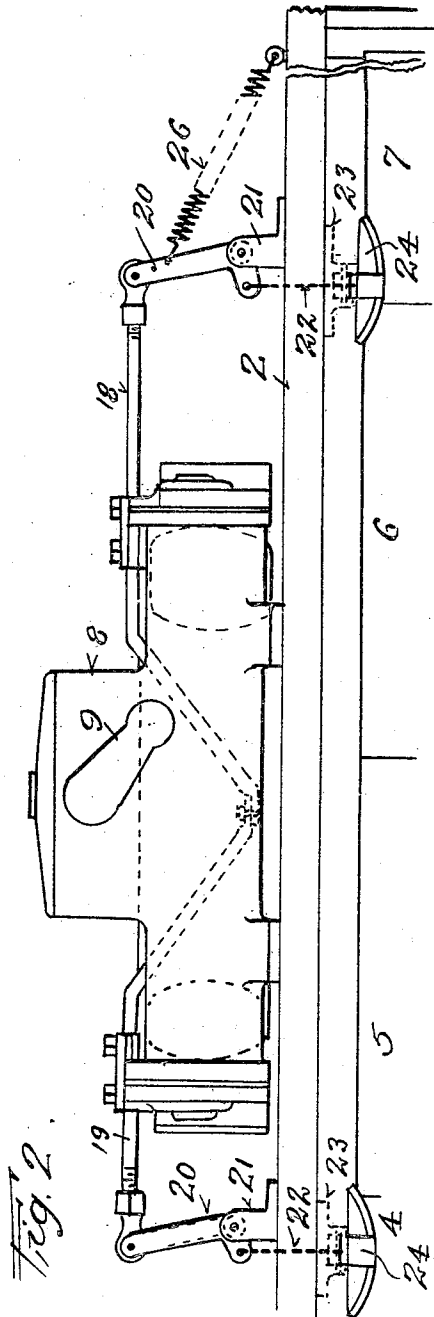
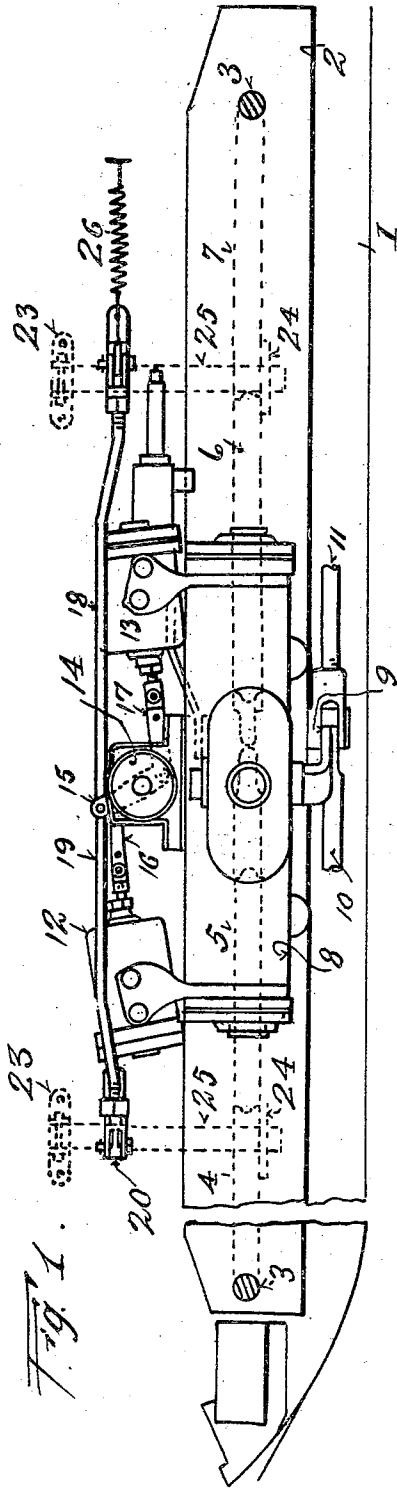
T. LAURENT

1,805,249

LOCK FOR FOLDING DOORS

Filed Oct. 1, 1927

2 Sheets-Sheet 1



Thomas Lawrent
By his Attorneys
Harby & Harby

May 12, 1931.

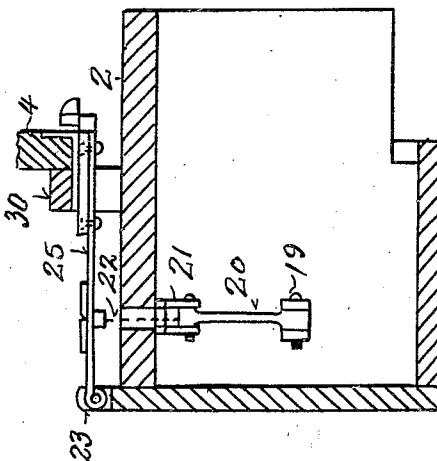
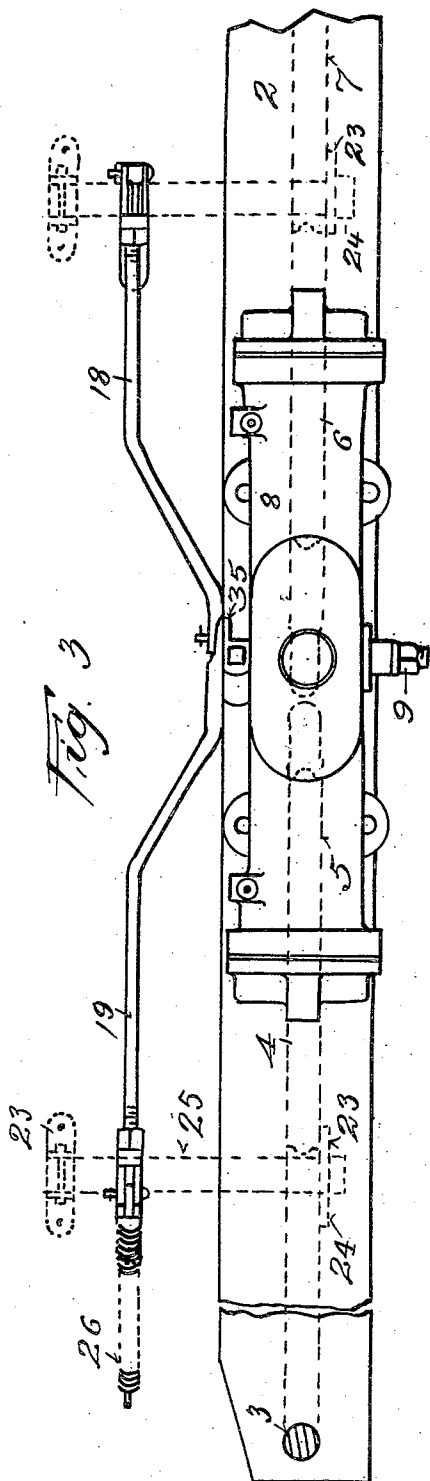
T. LAURENT

1,805,249

LOCK FOR FOLDING DOORS

Filed Oct. 1, 1927

2 Sheets-Sheet 2



Inventor
Thomas Laurent
By his Attorneys
darby & darby

UNITED STATES PATENT OFFICE

THOMAS LAURENT, OF RAEWAY, NEW JERSEY, ASSIGNOR TO NATIONAL PNEUMATIC COMPANY, OF NEW YORK, N. Y., A CORPORATION OF WEST VIRGINIA

LOCK FOR FOLDING DOORS

Application filed October 1, 1927. Serial No. 223,273.

This invention relates to locks for folding doors and the like.

One of the objects of this invention is the provision of a simple lock structure for doors of the folding type, either of the double or single leaf construction, which is arranged to be operated by means of the door moving engine.

A further object of this invention is the provision of door locks operated by the door moving engine which are released when the engine control valve is operated so that the doors can only be opened upon the initiation of the door engine movement through the agency of the control valve.

Another object of this invention is the provision of door locks of this type which are arranged to lock the doors in closed position and which are arranged to release the locks from the door engaging position upon initiating the operation of the door engine.

A still further object of this invention is the provision of locks for engine operated doors of this type which are arranged to return to locking position when the doors are closed.

These and other objects as will appear from the following description are secured by means of this invention.

This invention resides substantially in the combination, construction, arrangement, and relative location of parts as will appear more fully in the following disclosure.

Referring to the drawings—

Figure 1 is a top plan view showing the association of the doors, engine, and locks,

Figure 2 is a side elevational view of these elements,

Figure 3 is a top plan view of a modified method of connecting locks to the engine,

Figure 4 is a secondary view through the car framework looking at the lock structure from the left hand end of Figure 2 with the engine omitted for clearness.

It is the purpose of this invention to provide locking means for doors of the folding type such as are at present employed on moving vehicles. The combination of this invention provides locking means for the doors which are arranged to be released from engagement with the doors on the initiating op-

erations which control the engine. In one form of the invention the lock operating connections are connected to the lever which operates the valve which controls the engine operations. In the other form of the invention these lock connections are connected directly to the engine operating shaft.

Referring to the drawings, the outline of the top of the vehicle is shown at 1 and at 2 is shown the top of the door casing. The vertically extending door operating shaft is shown at 3 on which are mounted two sections of the doors 4 and 7. Attached to these sections by means of hinges are the other sections of the doors 5 and 6. This arrangement constitutes the well known double leaf type folding door. It is pointed out here that the principles of this invention may be applied to the single leaf type of door. The door folding engine is shown at 8 mounted directly over the doors themselves. The crank 9 is connected to the engine shaft and comprises the means for operating the connections 10 and 11 which are attached to the door shaft 3 in the usual well known manner.

As is usual in connection with this type of engine, the valve pullers 12 and 13 are mounted directly on the engine casing and are connected respectively by means of the pivoted levers 16 and 17 to the arm 15 which operates the valve 14. This valve controls the supply and the exhaust of the fluid to the engine. The construction and association of the engine valve pullers and valve are of well known construction and form no part of this invention. The arm 15 is pivotally connected to the two rods 18 and 19 which are in turn pivotally connected to bell crank levers 20 mounted in the brackets 21. Mounted on the under side of the door frame member 2 are two supports 23 on which are mounted the flat spring arms 25. These spring arms are connected by means of chains 22 to the bell crank levers and have catches 24 on their free ends for engaging with the top of the doors.

To overcome the resistance offered by the spring members 25 in order not to overload the engine a spring 26 is connected to the car frame and one of the bell crank levers to aid

the engine in carrying out the unlocking operation.

In the operation of this device when the motorman supplies fluid to the valve puller which operates valve 14 to admit fluid to the engine for the door opening operation the movement of the valve puller causes the spring members 25 to be raised through the agency of the connecting rods 18 and 19. This releases the doors so that they may be opened by the door engine.

In the arrangement shown in Figure 3 the crank 35, which is mounted on the door engine shaft, is pivotally connected to the two lock operated rods 18 and 19. In the operation of this device when fluid is supplied to the engine the initial movement thereof causes the locks to release the doors through the agency of the rods 18 and 19.

From the foregoing disclosure it will be apparent that I have provided a relatively simple structure for carrying out the objects set forth above. I am aware that numerous changes in the details of construction and relative arrangement of parts may have occurred to those in the art and that I do not desire therefore to be limited to the exact structure disclosed by me in an illustrated sense but rather to the scope of the invention set forth in the appended claims.

What I seek to secure by United States Letters Patent is:

1. The combination with a plurality of folding doors and an engine for moving the doors of a valve for controlling the operation of the engine, separate pneumatic means for operating said valve, means for locking the doors closed and means mechanically connected with said valve operating means and said locking means for releasing said locking means upon the operation of the valve.

2. The combination with a plurality of folding doors of pneumatically operated valve means for controlling a door operating engine, locks for said doors, bell crank levers connected to each of said locks and mechanical means connected to said valve means and said cranks for releasing said locks before the initial movement of said door operating engine.

3. The combination with a plurality of folding doors and a door operating engine of pneumatically operable valve means for controlling said door operating engine, locks for said doors, bell crank levers connected to said locks by means of nonextensible chains and mechanical means connected to said pneumatic valve means and said cranks for releasing said locks before the initial movement of said door operating engine.

4. The combination with a plurality of folding doors, a fluid pressure operated engine for actuating said doors, and means for controlling said engine, of means for locking said doors closed consisting of a resilient

flat member and a latch member, means for releasing the lock including a bell crank lever and a non-extensible chain, before initiation of the door opening movement of the engine, and means connecting the means for controlling the engine with the last mentioned means.

5. The combination with a plurality of folding doors, a fluid pressure operated engine for actuating said doors, and means for controlling said engine, of means for locking said doors closed consisting of a spring arm and a latch member, resilient means for balancing the spring arm and latch member, means for releasing the lock before initiation of the door opening movement of the engine, and means connecting the means for controlling the engine with the last mentioned means.

6. The combination with a plurality of folding doors, an engine for moving the doors, and means for controlling the engine, of locking means comprising a flat resilient member and a catch thereon for locking the doors in closed position by engaging the top of the doors and means mechanically connecting said means for controlling the engine and the locking means for releasing the locking means before the initiation of the door opening movement of the engine.

7. The combination with a plurality of folding doors and a door operating engine, of pneumatically operable valve means for controlling said door operating engine, locks for said doors comprising a flat resilient member and a catch thereon for engaging the top of the doors, bell crank levers connected to said locks by means of non-extensible chains, and mechanical means connected to said pneumatic valve means and said cranks for releasing said locks before the initial movement of said door operating engine.

In testimony whereof I have hereunto set my hand on this 26th day of September A. D., 1927.

THOMAS LAURENT.