

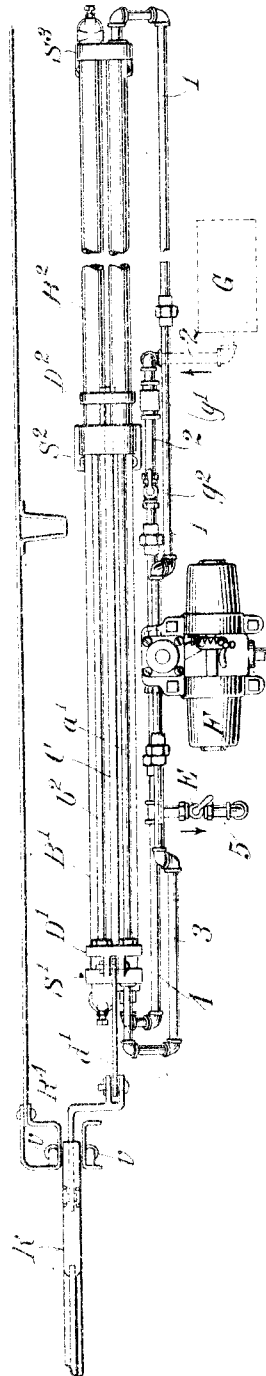
J. F. McELROY.
 LOCK FOR DOOR MOTORS.
 APPLICATION FILED APR. 19, 1911.

Patented Mar. 25, 1913.

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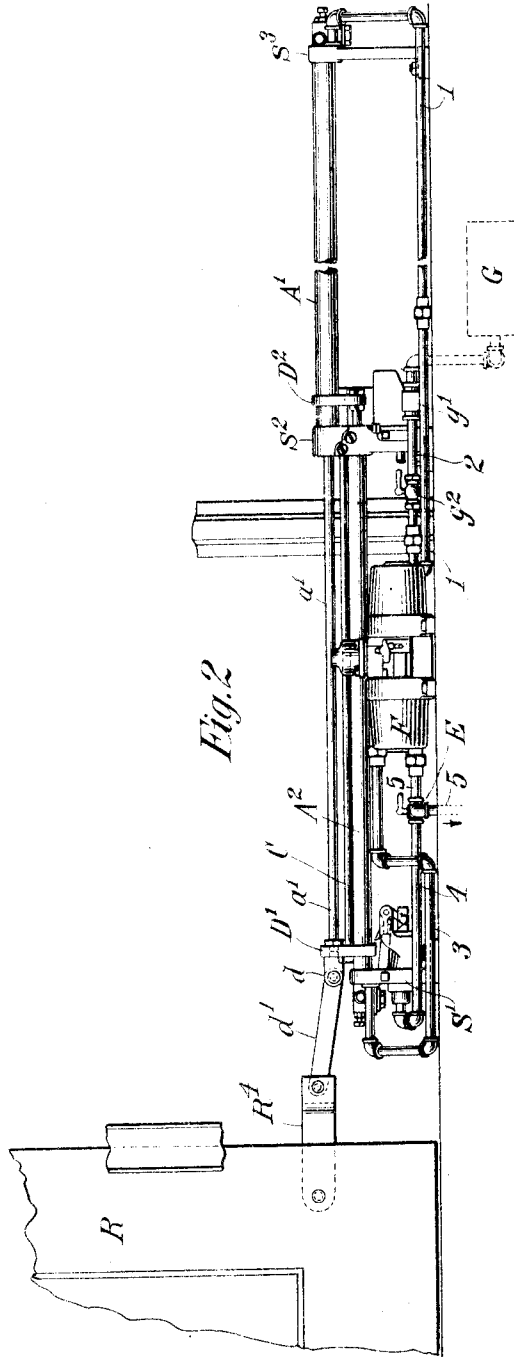
1,056,924.

Fig. 1



Witnesses:
Raphael Heller
L. J. Shaw

Fig. 2



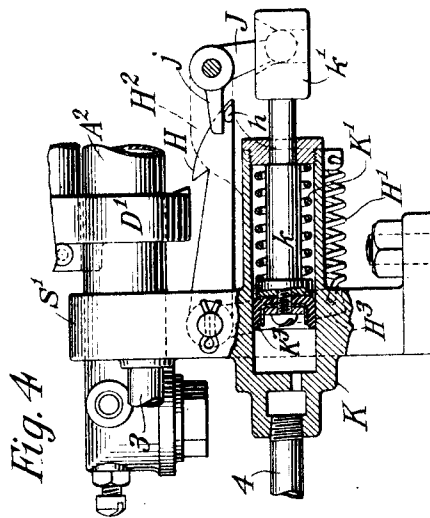
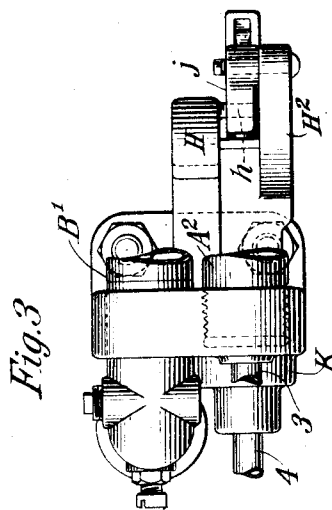
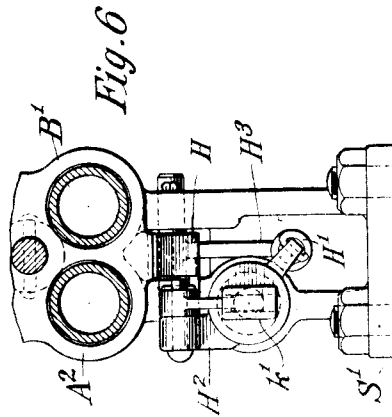
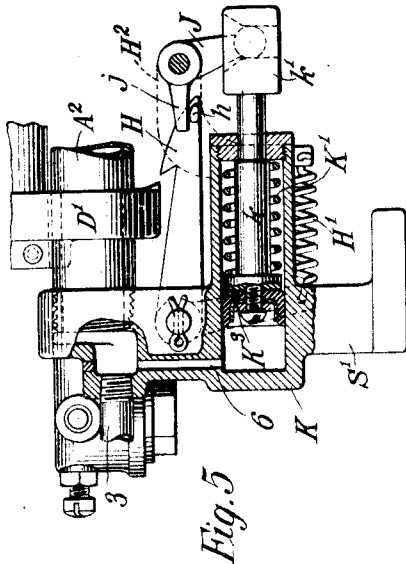
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 By *E. M. Brinley* Attorney

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Witnesses:

Raphael Vetter
 L. J. Shaw

James F. McElroy Inventor
 By his Attorney
 E. M. Smith

UNITED STATES PATENT OFFICE.

JAMES F. McELROY, OF ALBANY, NEW YORK, ASSIGNOR TO CONSOLIDATED CAR HEATING COMPANY, A CORPORATION OF WEST VIRGINIA.

LOCK FOR DOOR-MOTORS.

1,056,924.

Specification of Letters Patent.

Patented Mar. 25, 1913.

Original application filed March 7, 1911, Serial No. 612,811. Divided and this application filed April 19, 1911. Serial No. 622,029.

To all whom it may concern:

Be it known that I, JAMES F. McELROY, a citizen of the United States, residing at Albany, county of Albany, State of New York, have invented certain new and useful Improvements in Locks for Door-Motors, the following being a full, clear, and exact disclosure of the one form of my invention which I at present deem preferable.

For a detailed description of the present form of my invention, reference may be had to the following specification and to the accompanying drawing, which illustrates my invention.

Figure 1 is a plan view of a door motor provided with my improved lock. Fig. 2 is a side elevation thereof, and Figs. 3, 4, 5 and 6 show the details.

My invention relates to an automatic lock for a door motor, preferably of the pneumatic type, by which the door when closed by the motor will be locked automatically and automatically unlocked when the motor starts to open the door. In one form of my invention I so arrange the lock that it will automatically engage after a predetermined time interval so as to relock the door in the event of the door failing to open and the operator neglecting to return the controller handle to the door-closing position.

This application is a division of my pending application Serial No. 612,811, filed March 7, 1911.

Turning to the accompanying drawings 35 A¹ and A² are two open-ended cylinders, facing each other but upon different levels, as more clearly appears in Fig. 2.

B¹ and B² are cushioning or dash-pot cylinders corresponding respectively to A¹ 40 and A².

A cross-head D¹, connected to the piston rods a¹ and b¹ of the respective cylinders A¹ and B¹, travels on the set of cylinders A² and B², while a similar cross-head D² 45 connected to the piston rods of the cylinders A² and B² travels on the cylinders A¹ and B¹. The two cross-heads D¹ and D² are connected by a rod C, so that the four piston rods and the two cross-heads all move together. 50 The cylinder B¹ acts as a cushioning cylinder or dash-pot for the power cylinder A¹, and, similarly, the cylinder B² serves as a cushioning cylinder or dash-pot for the power cylinder A². Thus if air is admitted to the

right-hand closed end of the cylinder A¹ 55 through the pipe 1, its piston rod a¹ will be forced to the left and at the same time the piston in cylinder B¹ will also move from the right hand open end of that cylinder toward the left-hand end, and tend to compress the air therein, which escapes, however, through a restricted outlet. Conversely, if the air is admitted to the left-hand closed end of cylinder A² by the pipe 3, the piston rod a² will move to the right 65 and the piston of cylinder B² will similarly move to the right and provide the cushioning or dampening effect upon the action of the cylinder A². On the cross-head D¹ are two ears d d which are connected to the 70 door R through a link d' and the offset link R¹ on the door.

The several cylinders are provided with independent supports at their opposite extremities and also at the central point, where 75 their ends meet, the support at the extremities being provided by the end standards S¹, S³, and at the center by the intermediate standard S², this arrangement affording means for easy removal of either set of 80 cylinders.

The arrangement and mode of operation as thus far described constitute no part of the invention claimed in the present application. 85

On one of the standards S¹ (see Figs. 4, 5 and 6) is pivoted a hook or latch H which, in its elevated position, will engage the lower edge of the cross-head D¹ and lock it in position at the left-hand end of its range 90 of travel, the door being then shut. The latch H is in the form of a bell-crank lever with a downwardly projecting branch H³, shown in dotted lines in Figs. 4 and 5 and in rear elevation in Fig. 6, which is engaged 95 by an operating spring H¹ that always tends to throw the latch upward into engagement with the cross-head D¹. On the standard S¹ there is also formed a cylinder K in which is a piston K³, whose piston rod k carries at 100 its outer end a block k¹ in which is loosely pivoted one arm of a stop lever J. The stop lever J is also of bell-crank form and has a horizontal branch j constituting a stop for the latch H by engagement with a lug h 105 at the top and on one side of the latch H. The lever J is journaled in a bracket H², which is shown in plan in Fig. 3 and in an

end elevation in Fig. 6, but in Figs. 4 and 5 is merely indicated by dotted lines. The piston K^3 in cylinder K acts against a spring K^1 which tends to force the piston to the left, when the air pressure back of the piston is released, and thereby operate the stop lever J to release the latch H and allow the latch to rise so as to engage the cross-head D^1 when the said cross-head moves into its door-closing position. In Figs. 4 and 5 the piston K^3 is shown at the right-hand end of its stroke with the stop j engaging the lug h on the latch H . This is the condition when air pressure is present in the cylinder K and, if the latch H should at any time be in its raised position in latching engagement with cross-head D^1 , the admission of air to cylinder K would force the piston K^3 to the right against the force of the spring K^1 and thereby turn the stop lever J and cause the stop j to engage the lug h and thereby force down the latch H to release the cross-head D^1 . The cylinder K with its piston K^3 form a supplementary pneumatic motor for operating the lock. It will be understood that, while the door is moving to its closed position, there should be no air pressure on the cylinder K , so that when the door is nearly closed the cross-head D^1 will strike the latch H and, passing over the hooked end thereof, will first depress it against the force of its spring H^1 until the door is fully closed, when the latch will rise again behind the cross-head D^1 and lock the door. By this arrangement the door will be retained in its closed position, not only by such air pressure as may exist in the operating cylinder of the motor, but also by the latch H . This positively prevents the door from opening after the train has started and also renders it impossible for a passenger to open the door if the air should happen to be cut off from the motor. To release the door it is obviously necessary to admit air pressure to the cylinder K and I show two methods for accomplishing this.

In Fig. 5 there is a duct 6 which puts the rear end of motor cylinder A^2 in communication with the cylinder K , as a consequence of which the admission of air to cylinder A^2 by means of the pipe 3 to cause it to open the door, will simultaneously admit air to the cylinder K , which will act, in the way I have described, to draw down the latch H and release the door so that the air pressure in cylinder A^2 may act in its normal way to move the door from its closed to its open position. The other arrangement is shown in Fig. 4, wherein the air is admitted to cylinder K by means of a special pipe 4 connected to the exhaust pipe of the motor. The relation of this pipe 4 to the rest of the piping is shown in Figs. 1 and 2. In these figures G represents an air reservoir from which the air passes by means of pipe 2,

first through a strainer g^1 , then through a stop cock g^2 , to the inlet side of the controlling valve F . This controlling valve need not be described in detail, it being well understood that it may be of any ordinary type acting to admit air pressure to the power cylinder A^1 by means of the pipe 1 or the cylinder A^2 by means of the pipe 3. In the former case it will simultaneously connect the pipe 3 to the exhaust, while in the latter case it will simultaneously connect pipe 1 to the exhaust, so that when air is admitted to the working end of either cylinder the working end of the opposite cylinder is connected to the exhaust. The exhaust pipe is shown at 5 and contains an adjustable cock E . The exhaust pipe 5 will be connected to its appropriate point of the controlling valve F , and the branch 4 therefrom will conduct the air to the aforesaid lock cylinder K . In other words the cylinder K receives its air from the exhaust of either of the power cylinders A^1 A^2 by the said branch pipe 4, while the adjustable stop cock E will determine the amount of air pressure thus admitted to cylinder K by the pipe 4, and will therefore determine the length of time that such air pressure will be maintained in cylinder K , it being remembered that the stop cock E is not wholly closed, and that the air in the exhaust pipe 5 and its branch 4 will ultimately leak out through stop cock E at a rate dependent upon the extent to which that cock is open. Bearing this arrangement in mind, it will be understood that, assuming the door to be closed and that it is desired to open it, the control valve F will be turned in the proper direction to admit air to the door-opening cylinder A^2 , and at the same time to connect the door-closing cylinder A^1 to the exhaust. Thereupon the air which has been maintained in the door-closing cylinder A^1 will flow into the exhaust pipe 5 and its branch 4, and so operate the cylinder K to release the latch and permit the door to be opened by the action of cylinder A^2 . If, for any reason, the door should not be opened within a specified time, the air in the cylinder K will leak out through the cock E and allow the latch to come back to its locking position. The object of this arrangement is as follows: Dirt is apt to collect in the door slides and cause the door to stick, the air pressure being insufficient to move it against the friction caused by the dirt. Since the door does not open the motorman may forget to throw the controlling valve to the door-closing position, so that when the train starts the jarring may cause the dirt to release its grip on the door, which begins to move open while the train is in motion. By thus supplying the locking cylinder K with air from the exhaust the door will be unlocked in the usual man-

lev. so long as there is no undue friction or other defect in the operation, but if the door should stick and the motorman should neglect to throw his control valve, the door will, after a predetermined interval, become locked again and therefore cannot be jarred open by the movement of the train. By reversing the control valve the motorman can again admit air to the exhaust pipe and cylinder K and thereby cause the latch to be operated in the normal way.

What I claim as new and desire to secure by Letters Patent is:

1. The combination with a door motor, of an automatic lock for the door, a supplementary pneumatic motor for said lock connected to the exhaust of the door motor,

and a cock for controlling the operation of said supplementary motor by the said exhaust.

2. The combination with a pneumatic door motor, having a cylinder, piston, piston rod and cross-head, of a lock between said cross-head and a stationary portion of the motor and a pneumatic releasing device having a predetermined duration of time of operation.

In witness whereof I have hereunto set my hand, before two subscribing witnesses, this fifteenth day of April 1911.

JAMES F. McELROY.

Witnesses:

ERNEST D. JANSEN,
ROBERT M. COCHRANE.