

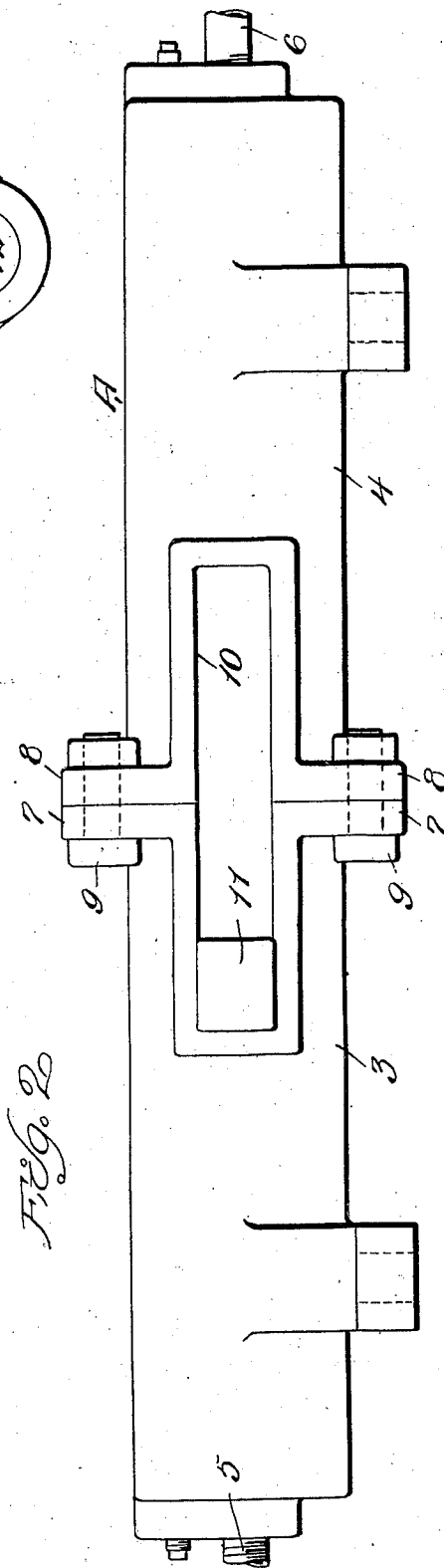
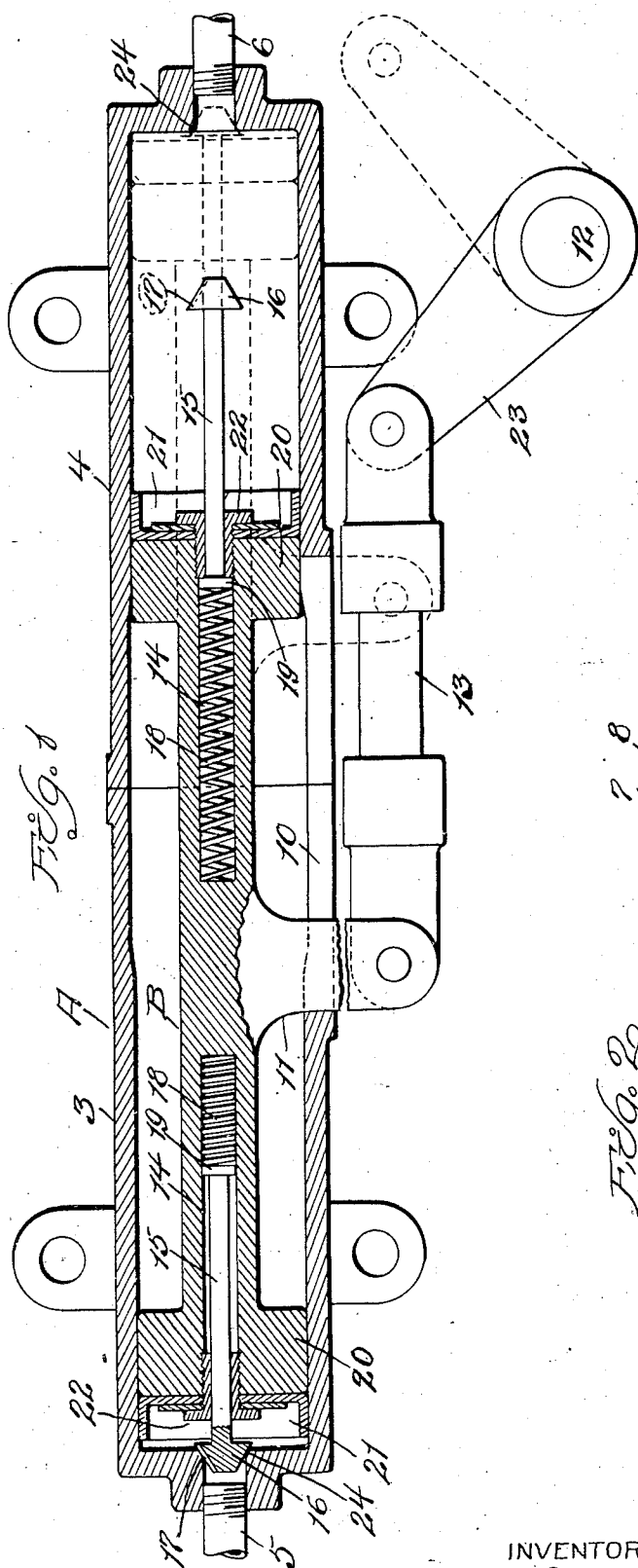
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J. M. DAPRON

DOOR ENGINE

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UNITED STATES PATENT OFFICE.

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DOOR ENGINE.

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My invention relates to improvements in door engines and has for its object to provide a pneumatically operated engine for opening and closing car-doors and car-steps.

The purpose of my construction is to provide an engine having a two-part cylinder and a single reciprocating piston mounted therein and arranged to exert its thrust or reverse movement directly upon a door-and-step control shaft; the piston being actuated by compressed air admitted alternately to the opposite ends of the cylinder, the piston having a sleeve controlled shock-absorber.

Drawings.

In the drawings—

Fig. 1 is a longitudinal horizontal mid-sectional view of an engine embodying my invention.

Fig. 2 is a side elevation of the same.

Description.

As shown in the drawings, I employ in the construction of my engine, the outer housing A composed of the halves 3 and 4 having the air supply pipes 5 and 6 respectively, and centrally mounted at their closed ends; these halves 3 and 4 are formed with the projecting locks 7 and 8 respectively, secured together by the bolts 9—9, or like fastening means. The median slot 10 is formed as shown, extending from the meeting edges of the halves 3 and 4, so that when the cylinder A is assembled as shown in Fig. 2 said slot 10 serves as a guide for the piston arm 11 which is formed at the center of the piston B, and is connected to the shaft 12 by the thrust-rod 13. The piston B is provided with concentric bores 14, in each of which is mounted a shock-absorbing mechanism comprising a plunger 15 having a conoidal terminal 16, which terminal 16 has a longitudinal grooved air-vent 17 upon its tapering face. Within the bore 14 is a coil spring 18 upon whose outer end the inner disk terminal 19 of the plunger 15 rests.

The piston B has its terminals formed to produce the annular heads 20, the outer face of each of which is provided with the cupped

washer 21. Each of the heads 20 is provided with a screw-thread gasket 22, serving both as a bearing for the plunger 15, and as a means for holding the cupped washer 21 in place.

Mode of operation.

The force of my engine is intended to be exerted upon a vertical shaft 12, which shaft serves to rest and lower the car-step, or open or close a car-step, or to perform all of said operations; said shaft 12 having the lever arm 23 connected to the piston arm 11 by the rod 13.

Assuming that the parts as illustrated in Fig. 1 represent the engine in door-closed position, and that it is desired to open the door, the operation is accomplished as follows:

Air is admitted through the pipe 5 and strikes the cupped washer 21 with the initial effect of throwing the piston B to the right, and to a point where the conoidal right terminal 16 reaches its seat 24. This operation is rapid, the air in advance of the right hand piston head 20 being vented into atmosphere. The conoidal terminal 16 having reached its seat 24 closes the air space behind it, forming an air cushion, which however is relieved by the vent 17 which provides for the gradual emission of air, during which process the right-hand piston head 20 has its progress checked by the action of the plunger 15 against the coiled spring 18. Against this resistance, the right-hand piston head 20 continues to travel until it reaches the end of the cylinder A and the end of its stroke.

As various embodiments may be made in the invention above set forth and as many changes might be made in the structure hereinbefore described, it is to be understood that all matter herein set forth is to be interpreted as illustrative and not in a limiting sense.

Claim.

I claim—

A door engine comprising a cylinder

having a median longitudinal slot and two heads each having a central valve-seat; a piston having a head at each of its terminals and having an arm extending through and operating is said slot; each terminal of said piston having a concentric bore provided with a spring and a plunger; each of said plungers having a conoidal head arranged to seat in one of said valve-seats and provided with a grooved air-vent, as described. 1

In testimony whereof I have hereunto affixed my signature.

JOSEPH M. DAPRON.