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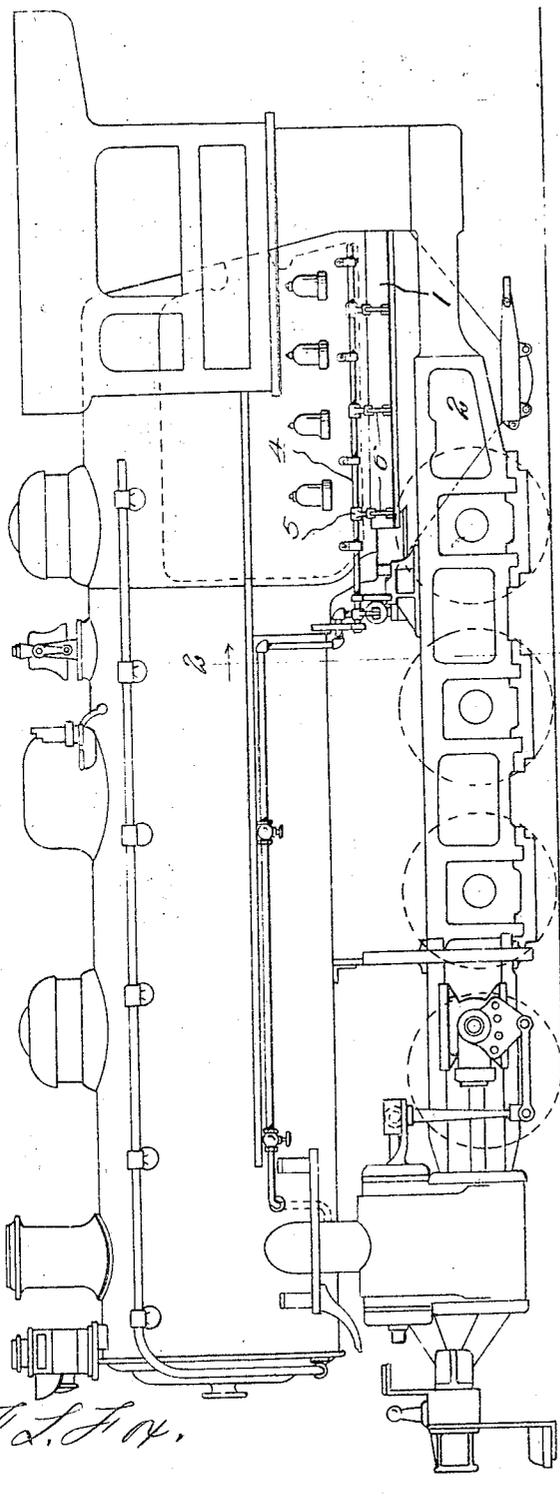
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C. E. SPAULDING  
DAMPER OPERATING DEVICE

Filed June 26, 1922

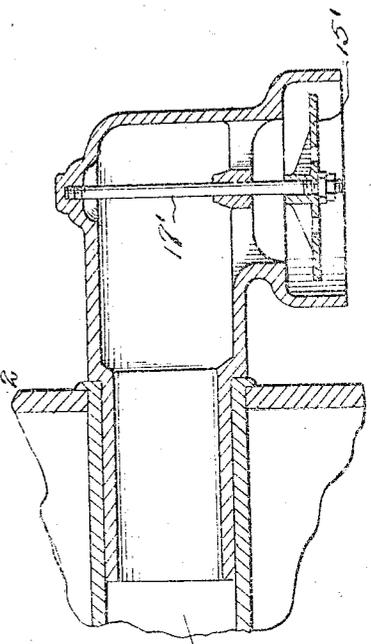
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*Fig. 1.*



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WITNESSES:



*Fig. 2.*

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INVENTOR

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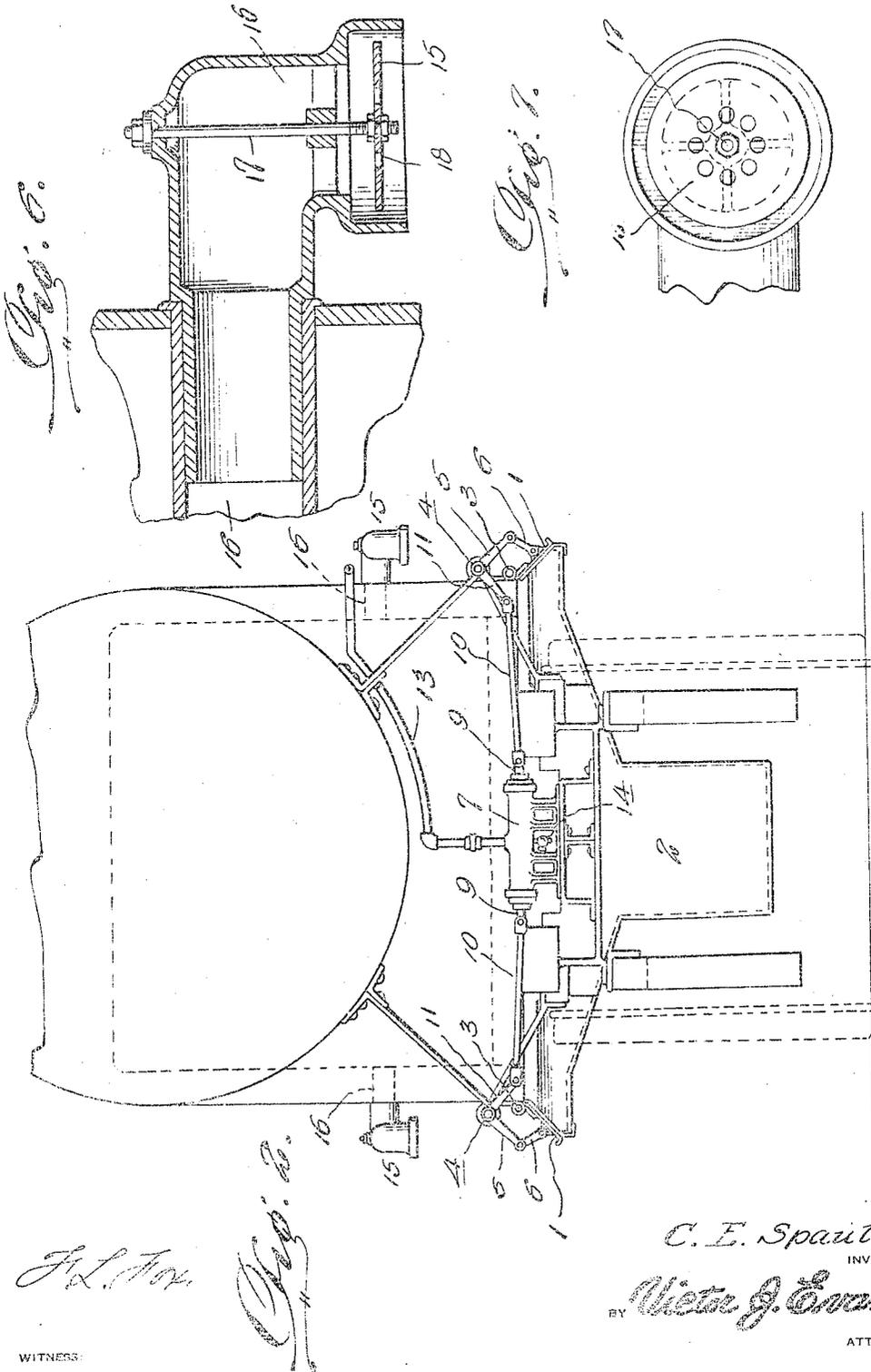
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*Fig. 6.*

*Fig. 7.*

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WITNESS

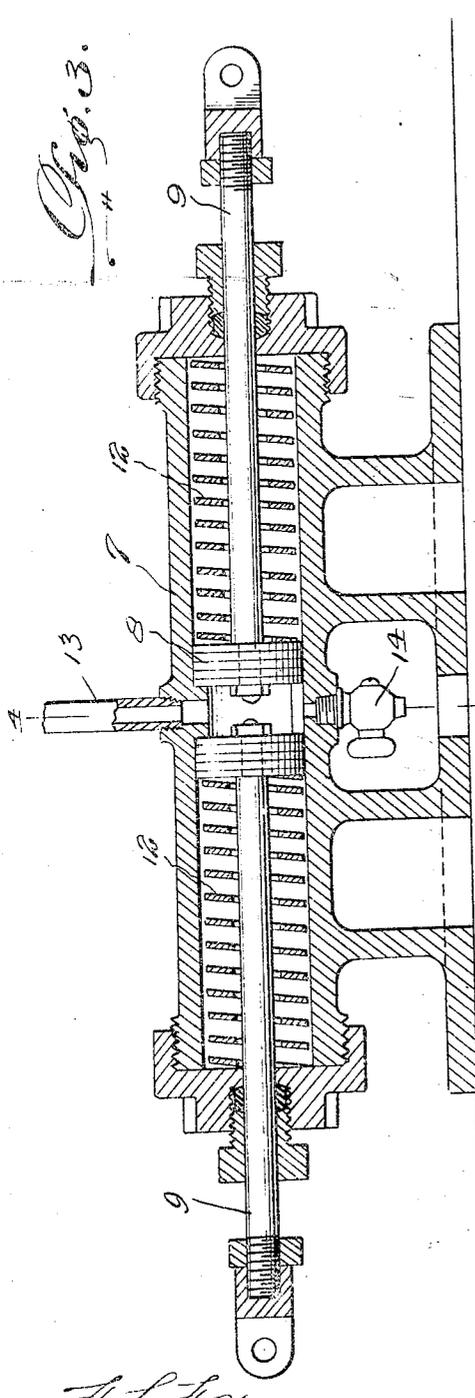
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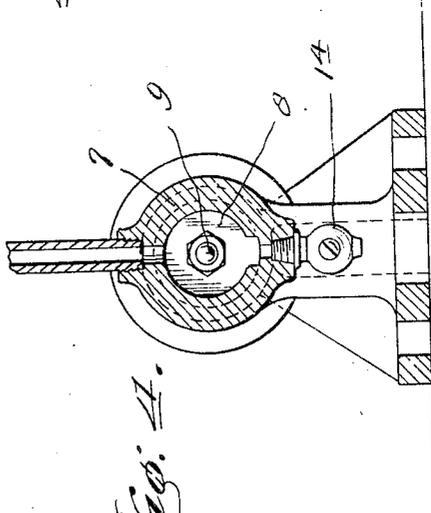
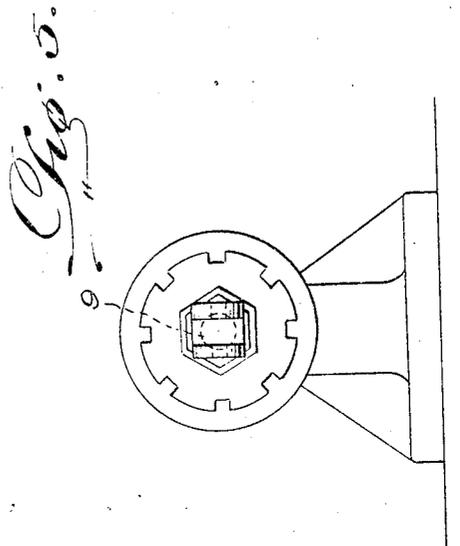
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3 Sheets-Sheet 3



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WITNESSES:



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# UNITED STATES PATENT OFFICE.

CHARLES E. SPAULDING, OF CENTRALIA, ILLINOIS.

DAMPER-OPERATING DEVICE.

Application filed June 26, 1922. Serial No. 570,950.

*To all whom it may concern:*

Be it known that I, CHARLES E. SPAULDING, a citizen of the United States, residing at Centralia, in the county of Marion and State of Illinois, have invented new and useful Improvements in Damper-Operating Devices, of which the following is a specification.

This invention relates to improvements in draft controlling means for locomotives, the general object of the invention being to provide automatic means for increasing the draft when steam is turned into the cylinders and for reducing the draft when the steam is shut off from the cylinders, thus increasing the efficiency of the engine and reducing the consumption of fuel.

Another object of the invention is to provide a cylinder to which steam is lead from the steam passage of the engine with damper operated means actuated by a pair of pistons in said cylinder for actuating damper means which control the supply of air to the ash pan of the locomotive.

A further object of the invention is to provide valves for controlling the supply of air to the combustion chamber above the fuel therein, such valves being normally open under the action of gravity but closed when the locomotive is working under forced draft.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

In describing my invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is a side view of a locomotive showing my invention in use.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a longitudinal sectional view through the cylinder which actuates the dampers.

Figure 4 is a section on line 4—4 of Figure 3.

Figure 5 is an end view of Figure 3.

Figure 6 is a sectional view through one of the vacuum actuated valves.

Figure 7 is a bottom plan view of the same.

Figure 8 is a sectional view of a modified form of vacuum valve.

In these views 1 indicates the valves or dampers for controlling the supply of air to the ash pan 2 of the engine. These dampers or valves are hinged at their upper edges, as shown at 3. A rocking shaft 4 is placed at each side of the engine slightly above each valve or damper and this shaft is connected with each valve by the arms 5 and the links 6. A cylinder 7 is suitably arranged in front of the fire box and this cylinder contains a pair of pistons 8, the rods 9 of which are connected by the links 10 with the arms 11 on the rock shafts so that the movement of the pistons in the cylinder will be communicated to the rock shafts to rotate the same and thus open the valves or dampers. Springs 12 are arranged in the cylinder and tend to hold the pistons in their innermost positions with the valves or dampers closed. Steam is adapted to be admitted to the cylinder at the center thereof and between the pistons by the pipeline 13 which is connected with the steam supply in the steam passage so that when steam is supplied to the cylinders some of the steam will pass to the cylinder 7 so that the pistons will be moved apart and actuate the rock shafts to open the dampers or valves. Thus air will pass to the ash pan and underneath the grate bars to secure the proper combustion of the fuel in the fire box. The cylinder 7 is provided with a bleed cock 14.

The means for decreasing the flow of air to the fire box above the fuel comprises a plurality of valves 15 for closing the air inlet passages 16 which lead to the space above the fuel in the fire box and being operatively mounted in substantially bell shaped casings 15' transversing the casings there is a guide member 16' which receives a stem 17. Each valve is carried by stem 17 which is slidably mounted in the guide member of the casing and the parts are so arranged that the valve will normally assume an open position under the action of gravity so that air will enter the fire chamber above the fuel therein. As soon as the draft within the fire box reaches a point where the suction is greater than the weight of the valve and stem the valve will move upwardly upon its seat and thus close the

inlet. I prefer, however, to form small holes in the valve 15 to permit a sufficient amount of air in the fire box to provide the products of combustion therein with the proper amount of air.

Instead of having the stem of each valve slidably arranged I may provide the valve with a sleeve 15' which is slidably mounted on the lower part of the stem 17', as shown in Figure 8. In this case the valve will move upon the stem when the suction is greater than the weight of the valve.

From the foregoing it will be seen that when the locomotive is idle the dampers 1 will be closed and the inlets 16 open so that the fire will be dormant. As soon as the throttle is opened, however, some of the steam will enter the cylinder 7 and acting upon the pistons therein will open the dampers 1 so that air can pass into the ash pan and through the fuel in the grate and at the same time the valve 15 will be closed by the suction within the fire box to shut off most of the air entering the upper part

of the fire box. Thus the draft is greatly increased to cause the combustion of the fuel. By this invention the locomotive will give the maximum service with the minimum amount of fuel.

What I claim is:—

In a locomotive, inlet means for supplying air to the upper part of the fire chamber thereof including a plurality of aligned valve members arranged exteriorly upon opposite sides of the fire box, said valve members being adapted to control inlet passages communicating with the fire box and each comprising a substantially L-shaped casing, a guide member transversing each casing, a stem depending from the upper end of each casing and slidably mounted in the guide member thereof for vertical movement, and a perforated valve secured to the stem and actuated by gravity and suction of the draft within the fire box as and for the purpose specified.

In testimony whereof I affix my signature.  
CHARLES E. SPAULDING.