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PATENTED DEC. 4, 1906.

T. B. GEISERT.  
EXHAUST AND DRAFT REGULATOR FOR LOCOMOTIVES.  
APPLICATION FILED SEPT. 28, 1906.

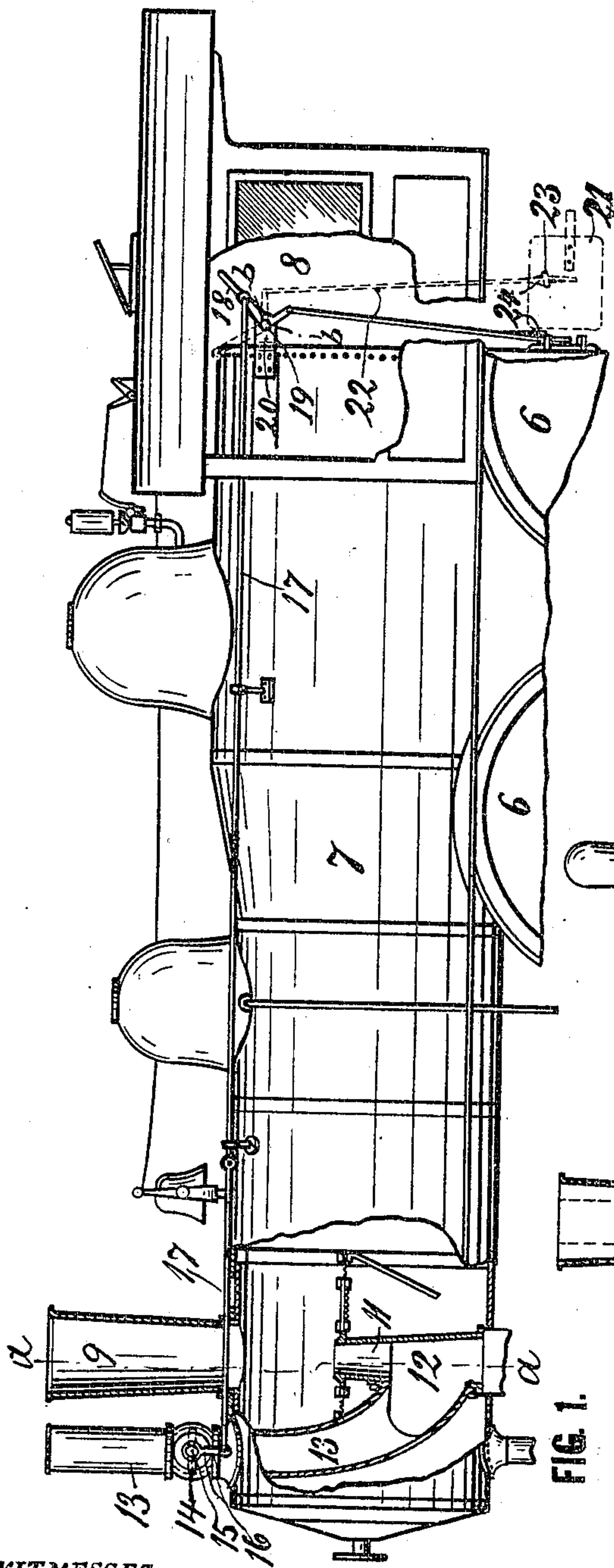


FIG. 1.

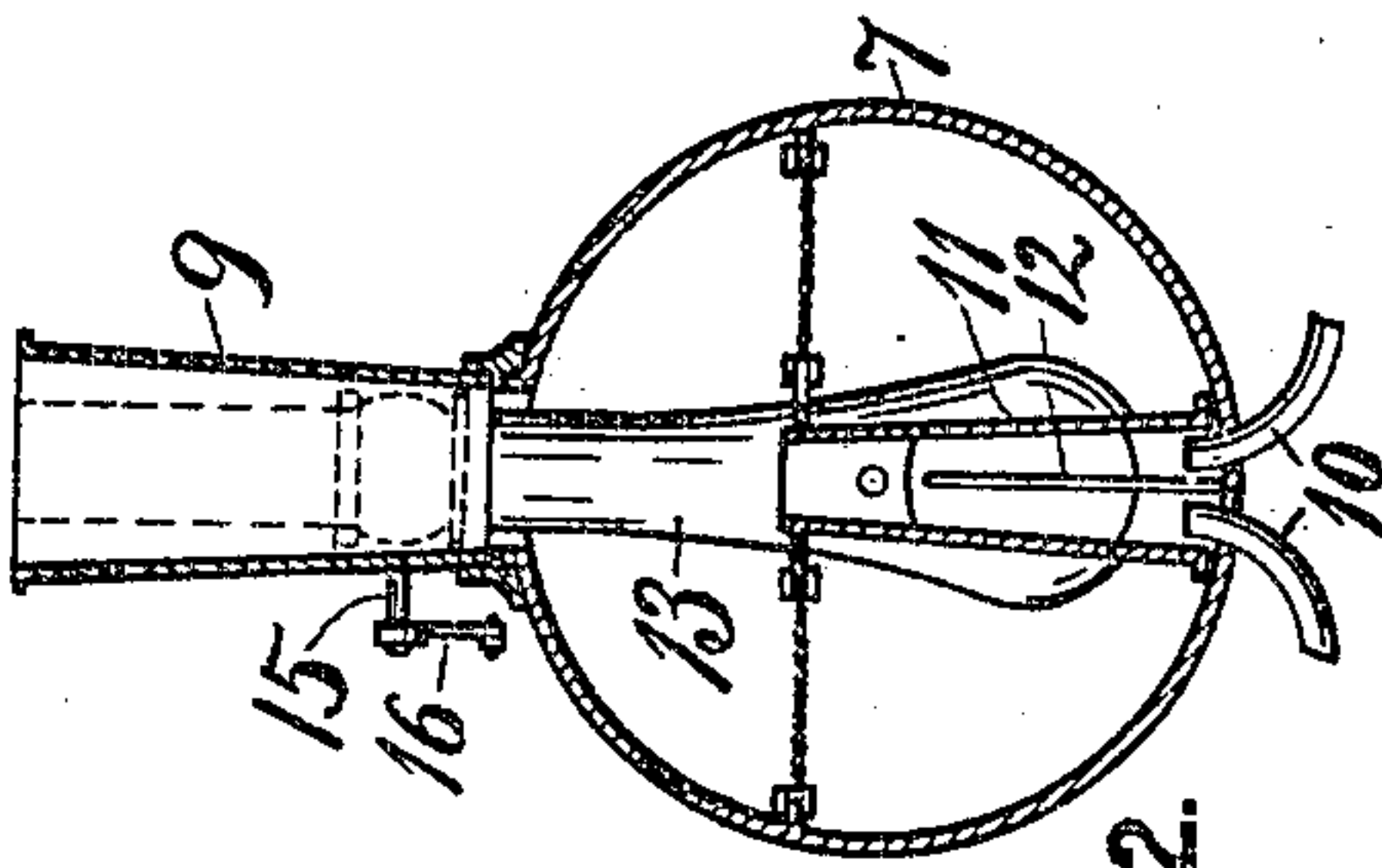


FIG. 2.

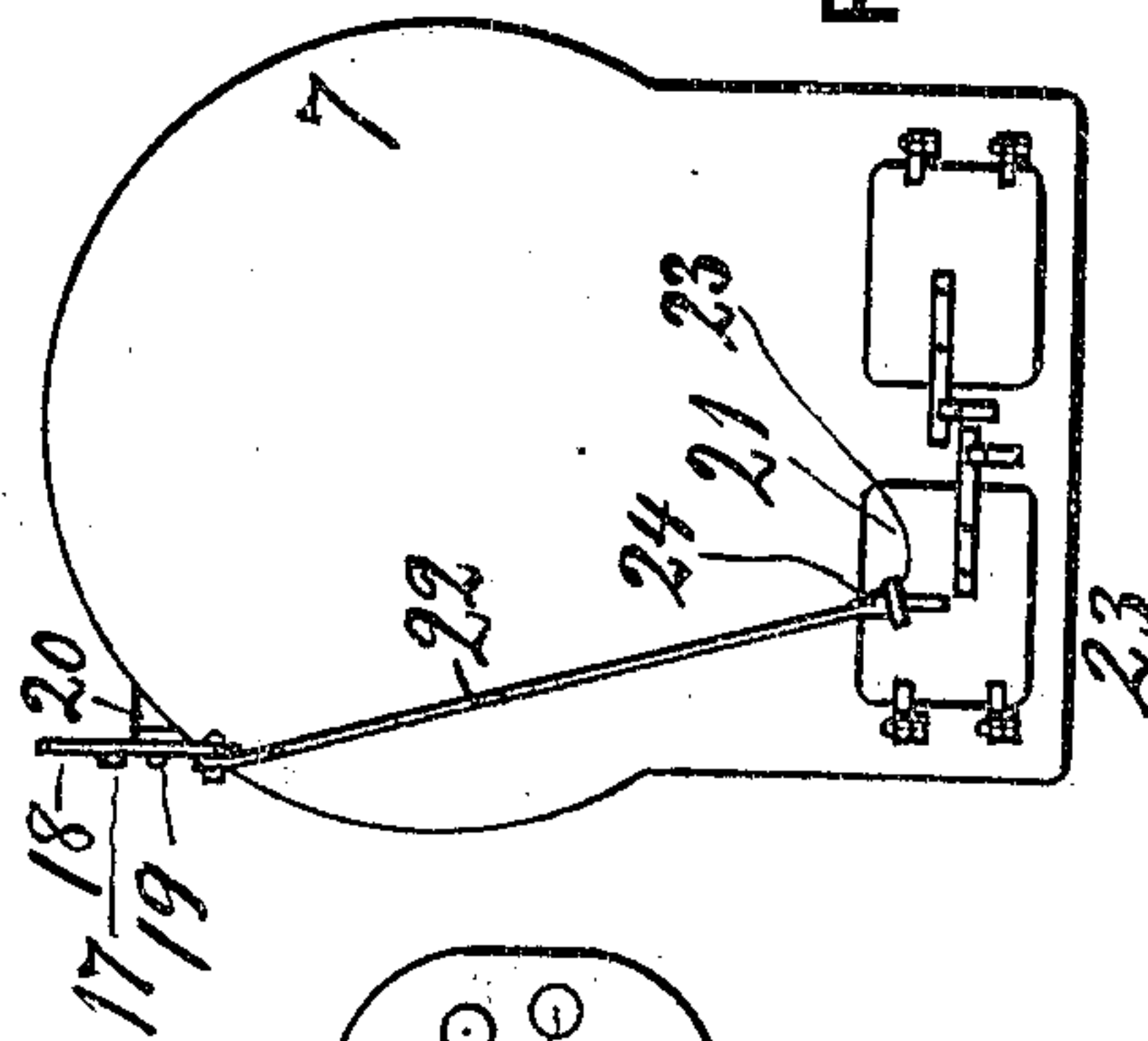


FIG. 3.

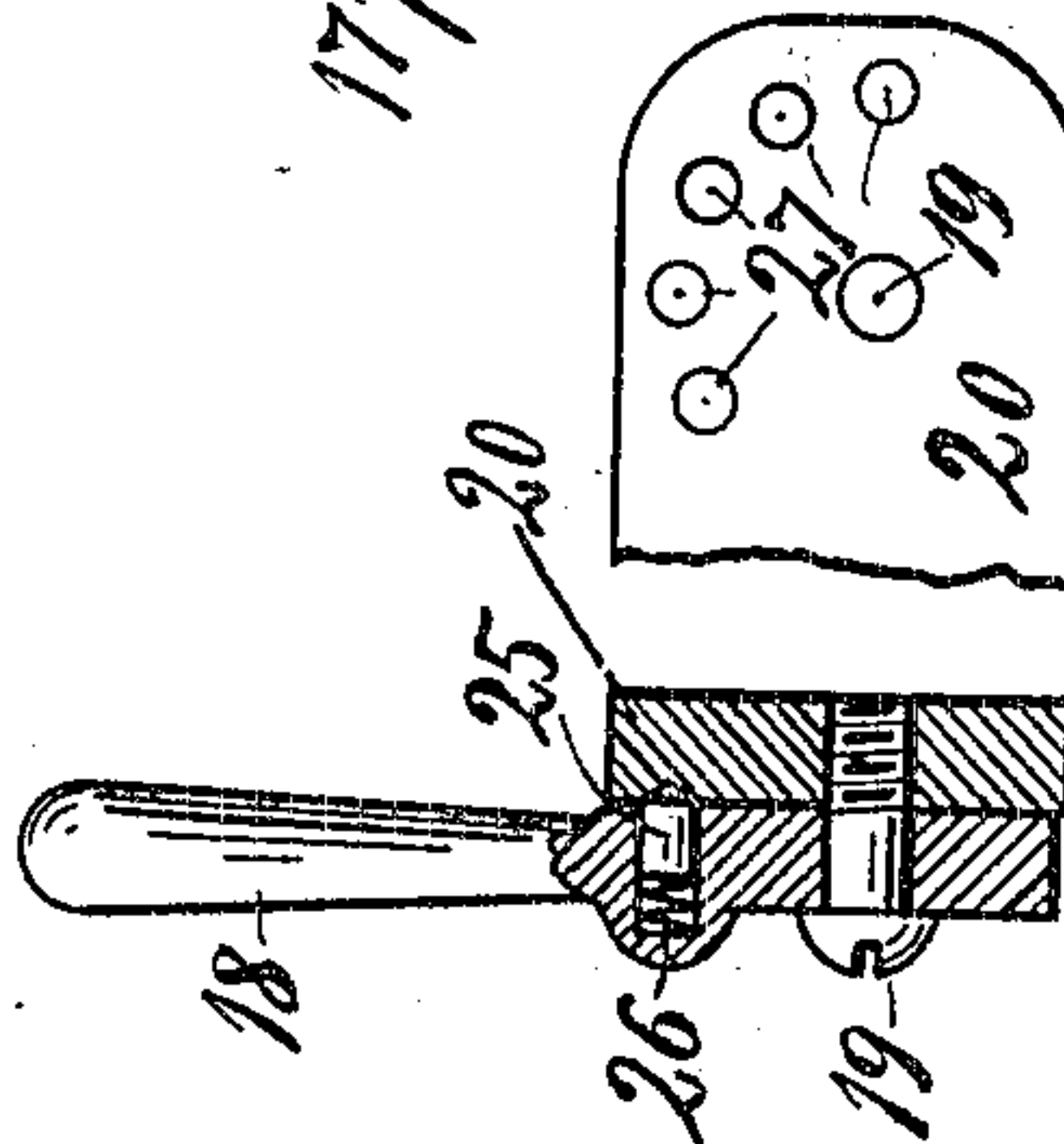


FIG. 4.

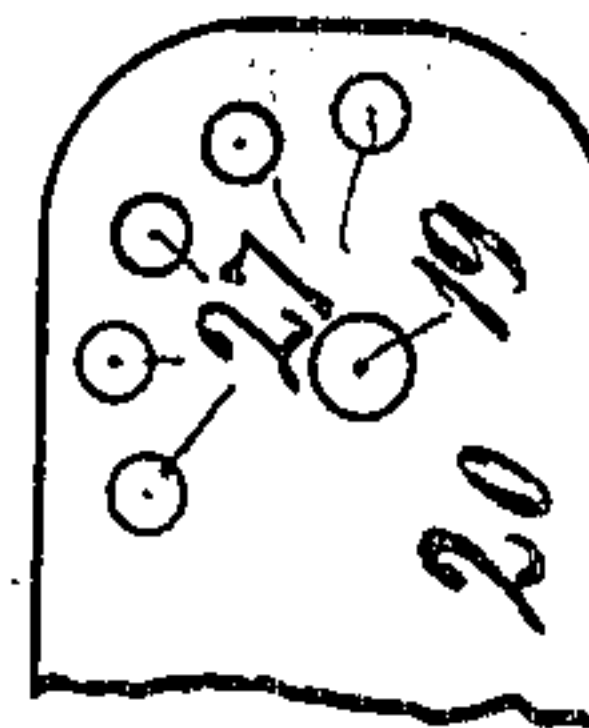


FIG. 5.

WITNESSES:

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Theophilus B. Geisert.  
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# UNITED STATES PATENT OFFICE.

THEOPHILUS B. GEISERT, OF ST. PAUL, MINNESOTA.

## EXHAUST AND DRAFT REGULATOR FOR LOCOMOTIVES.

No. 837,462.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed September 28, 1905. Serial No. 280,399.

*To all whom it may concern:*

Be it known that I, THEOPHILUS B. GEISERT, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Exhaust and Draft Regulators for Locomotives; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in exhaust and draft regulators for locomotives, and has for its principal object to provide means for diverting away from the regular smoke-stack of the locomotive more or less of the exhaust-steam which is usually employed to increase the draft to the fire, but in doing so often becomes so strong that the small coal is carried out of the fire before properly burned and is either carried up the smoke-stack or accumulated with the ashes below the smoke-stack. This and other objects I attain by the novel construction and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a locomotive with parts broken away or in section to admit better view of my invention applied thereto. Fig. 2 is a sectional rear elevation on the line *a a* in Fig. 1. Fig. 3 is a rear end elevation of the boiler of the locomotive with my device applied thereto. Fig. 4 is an enlarged sectional view on the line *b b* in Fig. 1, showing the hand-lever by which my device is controlled and the bracket supporting said lever. Fig. 5 is a face view of the bracket to the right in Fig. 4.

Referring to the drawings by reference numerals, 6 represents the wheels, 7 the boiler, 8 the cab, and 9 the regular smoke-stack, of a locomotive.

The exhaust-steam from the cylinders is usually conducted through suitable ducts, (indicated by the numeral 10 in Fig. 2) into the regular exhaust-nozzle 11, where a fixed guarding-plate 12 prevents the exhausted steam from one nozzle from resisting the steam from the other, while both of them send powerful puffs of steam from the nozzle 11 into the smoke-stack, so as to increase the draft therein.

At the front side of the large nozzle 11 I provide a suitable opening and a second stack or large exhaust-pipe 13 for the steam to escape when so desired without blowing up through the smoke-stack. In said exhaust-pipe is arranged a suitable valve 14, which in the present drawings is of the so-called "butterfly" type, consisting of a round plate fixed on a rock-shaft 15, having a rocker-arm 16, connected by a guided rod 17 to a lever 18, pivoted at 19 to a bracket 20, projecting from the boiler so near the fire-box that the lever may easily be reached and manipulated by the fireman. The lever may also be operated automatically by the opening of the furnace-door 21. This is done in the present instance by dropping the lower end of the rod 22 into a staple 23 in the door, with its shoulder 24 resting upon the staple and pivoting the upper end of the rod to the lever 18.

The lever 18 is yieldingly locked in different positions by having a dog 25 pushed by a spring 26 with its cone-shaped end into either of the cone-shaped cavities 27, which are arranged in the bracket 20 in the segmental line of motion of the dog when the lever swings on its pivot 19.

In Fig. 1 it will be seen that the shield 12 extends partly into the secondary stack 13, where it serves the same purpose as in the nozzle 11.

From the above description it will be understood that whenever the engineer or fireman wishes to reduce the draft in the main stack 9 he simply pushes the lever 18 into a position that will open the valve or damper 14 to the desired degree, so that the steam-pressure in the nozzle 11 will find outlet up the front stack 13. This he will usually do when opening the furnace-door, especially if the locomotive is going up a grade and puffs out the exhaust-steam with that much greater force, drawing the light coal along with the air admitted through the open door. When the lever 18 is operated by hand, the rod 20 slides up and down in the staple 23; but if the door is opened the staple will engage the shoulder 24 of the rod and push the latter upward, thereby operating the lever and opening the valve 14.

It is obvious that the lever 18 may have similar operative connection with any number of firing-doors and draft-doors on the boiler-furnace, and also that the lever 18 and its connection with the valve 14 and even the



valve itself may be of any suitable forms that will carry out the purposes set forth, and the location of the valve 14 in the stack 13 and the stack itself may be changed, and the play  
5 in the connection between the furnace-door and the hand-lever may be produced by any suitable means, all without diverging from the spirit and scope of my invention; but as it is impracticable to illustrate and describe  
10 all such variations in detail I must rely on the language of the below claims for the full scope and protection of the invention.

I am aware that attempts have been made to regulate the exhaust of locomotives by a  
15 series of nozzles of various sizes interchangeably arranged below the smoke-stack; but as a reduction of the nozzle tends to resist the exhaust and cause back pressure in the cylinders and as the same amount of steam is  
20 with such arrangement going up the stack it should be clearly understood that my invention is not of that kind, and I therefore do not claim an exhaust resister or reducer; but

25 What I claim, and desire to secure by Letters Patent, is—

1. In a locomotive, the combination with the regular smoke-stack and a nozzle in the fire-box directing the exhaust-steam up into  
30 the stack, of a second stack or pipe branching out from the lower part of the nozzle and extending upward near the regular stack, a valve or damper in the secondary stack near and above the fire-box, a substantially horizontal rod controlling said valve and extending  
35 with its rear end to the cab of the locomotive, a fulcrumed hand-lever pivotally connected with the said rear end of the rod, and a locking member adapted to hold the  
40 lever in various positions, for the purposes set forth.

2. In combination with a locomotive having the exhaust from the cylinders directed by a nozzle into the smoke-stack, of a secondary  
45 stack or pipe communicating with said nozzle and a suitable valve controlling the outlet of the exhaust-steam by way of the secondary stack, and means for operating said valve from the cab of the locomotive,  
50 said operating means comprising, among other elements, a hand-operated lever or handle and a locking member adapted to hold the lever in various positions, said locking member being spring-pressed so as to  
55 yield automatically when the lever is operated with suitable force, and operative con-

nection between said lever and a door communicating with the fire or furnace, whereby when the door is opened the valve will divert more or less of the exhaust-steam into  
60 the secondary stack or exhaust-pipe.

3. In combination with a locomotive having the exhaust from the cylinders directed by a nozzle into the smoke-stack, of a secondary  
65 stack or pipe communicating with said nozzle and a suitable valve controlling the outlet of the exhaust-steam by way of said secondary stack, and means for operating said valve from the cab of the locomotive, said operating means comprising,  
70 among other elements, a hand-operated lever or handle and a spring-pressed locking member adapted to hold the lever in various positions, so as to yield automatically when the lever is operated with suitable force, a connecting-rod  
75 between said lever and a door communicating with the furnace, whereby when the door is opened the valve will divert more or less of the exhaust-steam into the secondary stack or exhaust-pipe, said rod  
80 between the door and the lever having a play in its connection with the door whereby the lever may be used also without opening the door, substantially as set forth.

4. A locomotive having in its fire-box a  
85 nozzle adapted to blow the exhaust-steam into the regular smoke-stack, a secondary stack or pipe extending from an opening in the side of the nozzle and up through the fire-box, a valve in said secondary stack  
90 above the fire-box, a rock-shaft in said valve, a rocker-arm fixed on the shaft, a rod extending from said rocker-arm to the locomotive-cab, a hand-lever arranged within the reach of the fireman and connected  
95 with said rod; said valve being balanced on the rock-shaft and having opposite radial wings adapted to fit the stack when in a transverse position, a spring-pressed dog in the hand-lever to hold it yielding in different  
100 positions, and a connecting-rod between said lever and the door of the furnace of the locomotive, whereby the valve in the stack may be operated both at will and automatically by the door.  
105

In testimony whereof I affix my signature in presence of two witnesses.

THEOPHILUS B. GEISERT.

Witnesses:

A. M. CARLSEN,  
D. E. CARLSEN.