

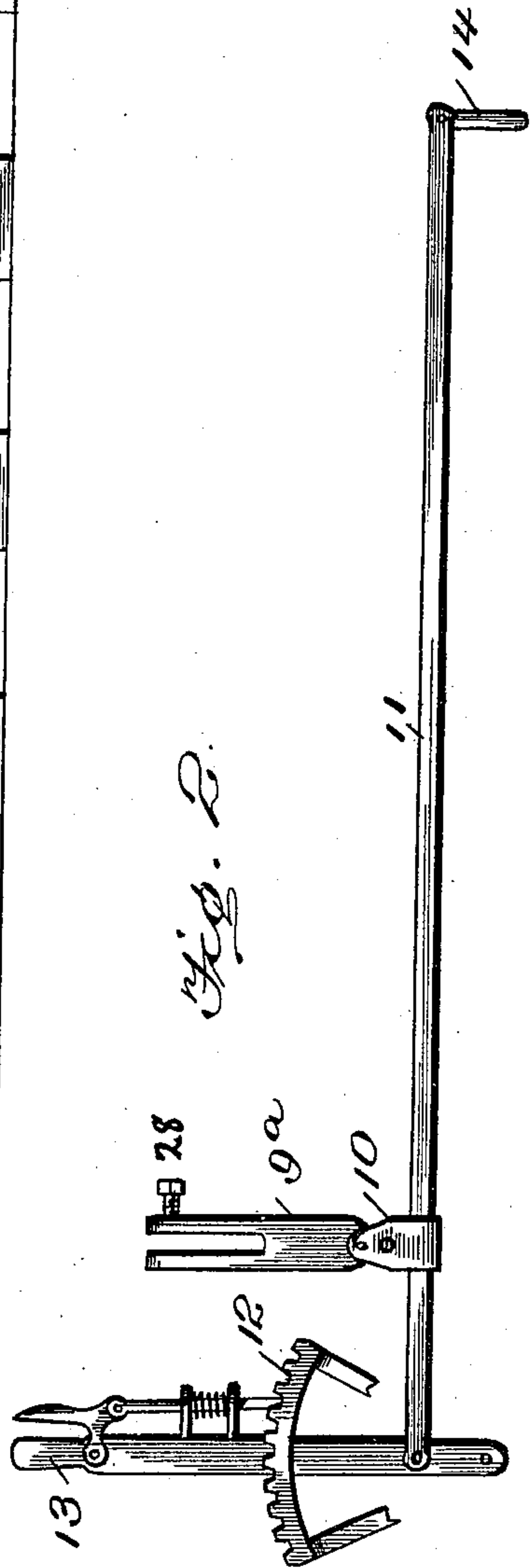
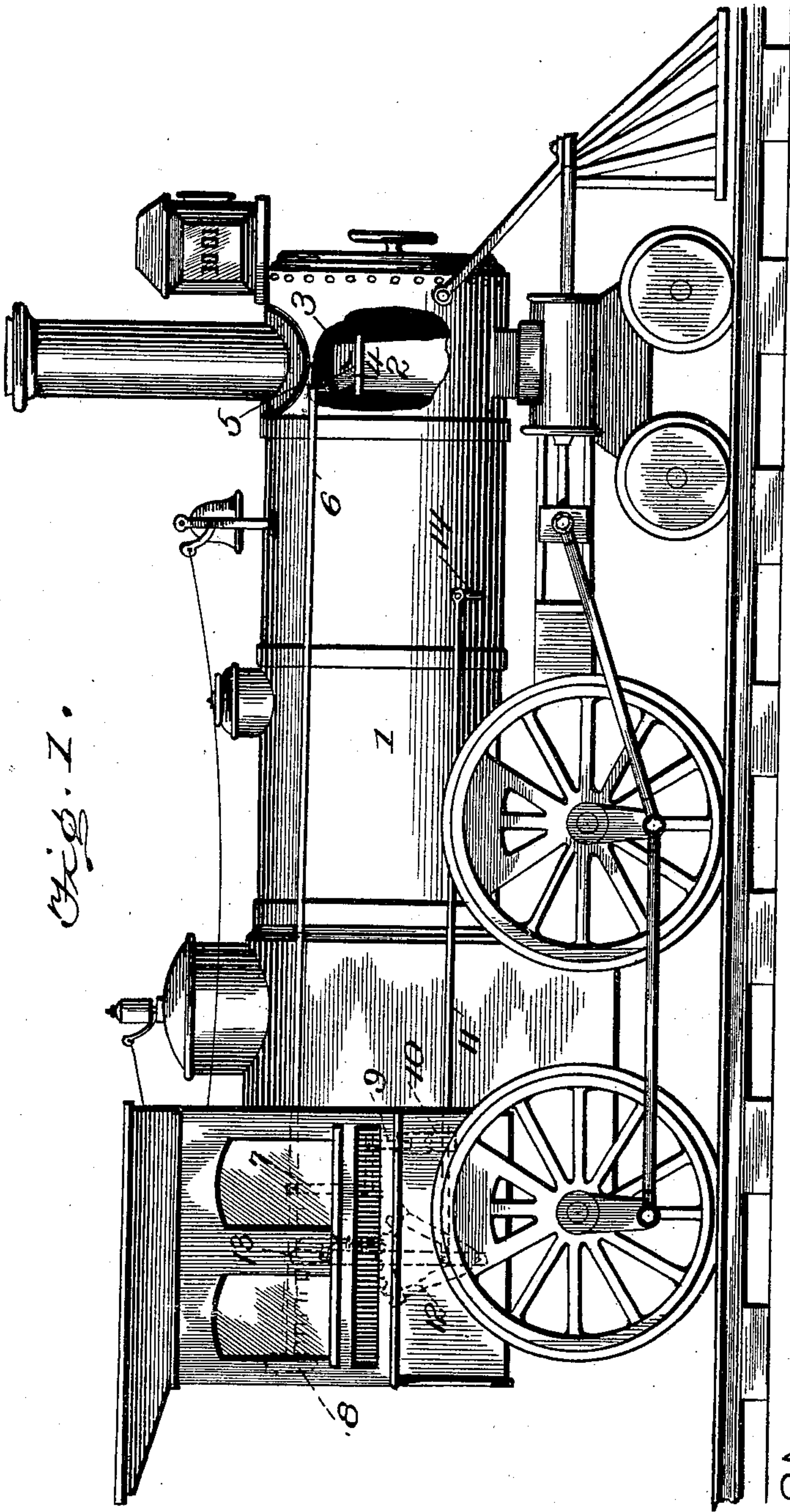
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H. O. OLSON.  
EXHAUST NOZZLE.

2 Sheets—Sheet 1.

No. 582,306.

Patented May 11, 1897.



Witnesses

*John Olson*  
John Olson

Inventor  
*Hans Otto Olson*  
By  
*John Olson*  
his Attorney

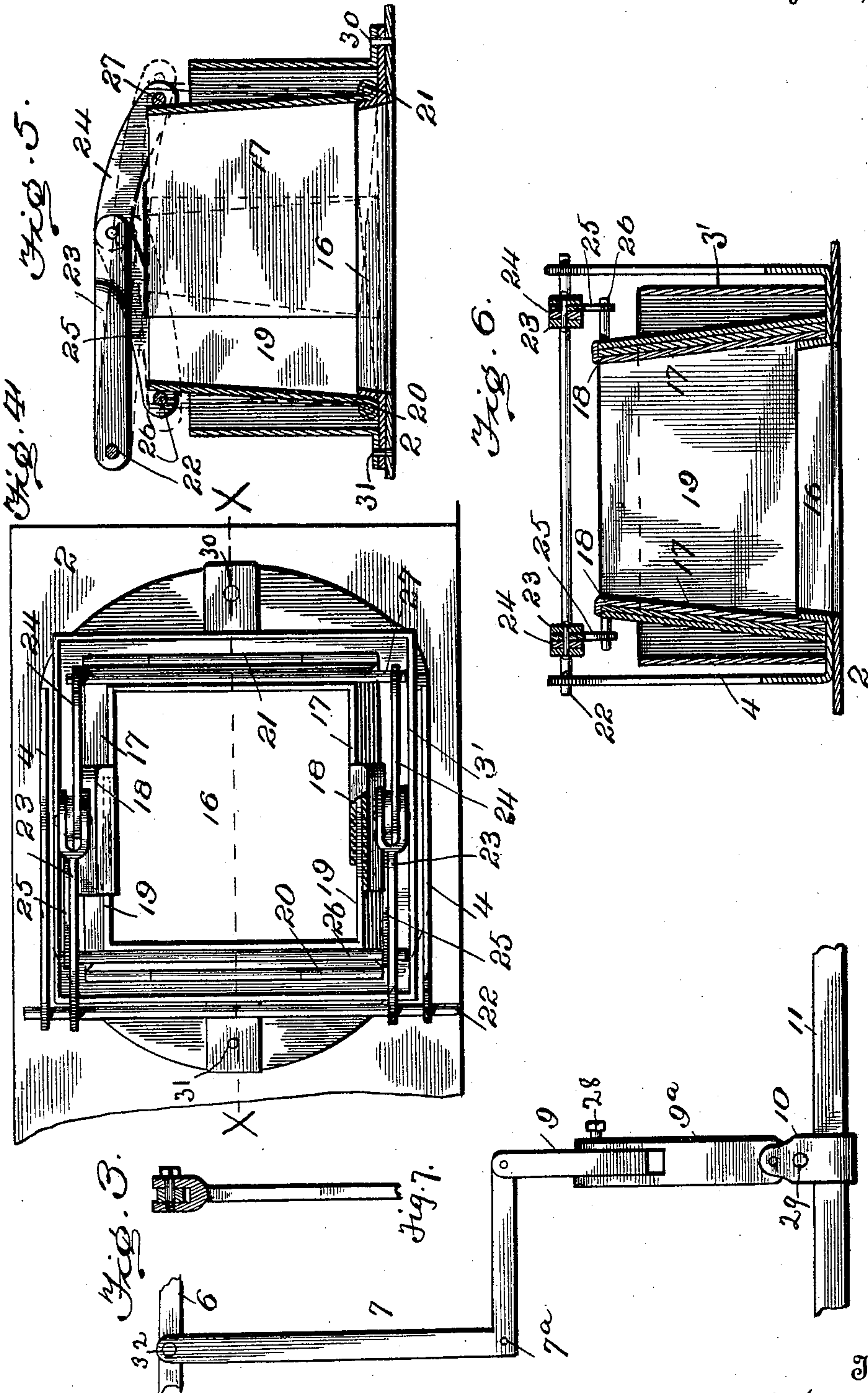
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# UNITED STATES PATENT OFFICE.

HANS OTTO OLSON, OF TWO HARBORS, MINNESOTA, ASSIGNOR OF ONE-HALF  
TO JOHN OLSON, OF SAME PLACE.

## EXHAUST-NOZZLE.

SPECIFICATION forming part of Letters Patent No. 582,306, dated May 11, 1897.

Application filed January 5, 1897. Serial No. 618,096. (No model.)

*To all whom it may concern:*

Be it known that I, HANS OTTO OLSON, a citizen of the United States, residing at Two Harbors, in the county of Lake and State of Minnesota, have invented certain new and useful Improvements in Exhaust-Nozzles; 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.

The object of my invention is to provide a new and improved attachment for an exhaust-nozzle for engines, especially locomotive-engines, which is simple and durable in construction and serves to govern the exhaust by increasing or diminishing the outlet.

The invention consists in certain parts which will be described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar numerals of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of the invention as applied to a locomotive-engine. Figs. 2 and 3 are detail views showing reverse-lever 13, having reach-rod 11 attached, on which clamp 10 is placed, to which links 9 and 9<sup>a</sup> and bell-crank 7 are connected. Fig. 4 is a plan view of the improved nozzle. Fig. 5 is a central vertical section of my improved attachment as applied. Fig. 6 is a central vertical section of my improved attachment as applied, taken on lines *x x* or at right angles to Fig. 5. Fig. 7 is a detail view of Fig. 3, showing upper end of bell-crank 7.

1 represents the boiler of an engine; 2, any ordinary exhaust-nozzle; 3, my improved attachment to the same; 4, the brackets on which shaft 22 is secured; 5, the arm extending from shaft 22, to which rod 6 is connected, extending back to the engine-cab and connected to bell-crank 7, which may be pivoted on the boiler or on any suitable bracket secured to the boiler or engine-cab for that purpose. To said bell-crank links 9 and 9<sup>a</sup> are connected. Link 9<sup>a</sup> may be made in the shape

of a fork for the reception of link 9 or in the form of a socket. Said links may be secured together by set-screw 28. Link 9<sup>a</sup> is attached to clamp 10, fastened to reach-rod 11 by bolt 29, said reach-rod being connected in the usual way to tumbling shaft 14 and reversing-lever 13 being placed at any ordinary place in the engine-cab and adjacent to quadrant 12. 3' shows outside casing, secured to exhaust-stand by bolts 30 and 31. Halves 17 and 19 comprise what is known as "nozzle-tips." They interpose each other. One overlaps the other at the top, as shown at 18. The object of said overlap is to keep out any substance which may interpose between said halves and prevent their free operation. Said halves are hinged to the base 16 by bolts 20 and 21. Bolts 26 and 27 are secured to the sides of said halves at their upper edge, and they act as pivots for links 24 and 25, which are connected to arms 23, secured on shaft 22. Base 16 acts as a guide for the guidance of the exhaust-steam before coming in contact with the tips. Rod 6 is made in the form of a loop or handle having a series of notches, as shown at 8.

The operation is as follows: Supposing the reverse-lever is at its central position, and it being desired to operate the exhaust-nozzle in connection with said reverse-lever and reach-rod, I fasten set-screw 28, that connects links 9 and 9<sup>a</sup> together, so they will operate as one. When the lever is in said central position, the tips are closest together. It will be noticed links 9 and 9<sup>a</sup> and bell-crank 7 being in a vertical and central position, by moving the said lever in either direction reach-rod 11 will likewise move and with it links 9 and 9<sup>a</sup> and pull down on the horizontal arm of bell-crank 7, and at the same time the vertical arm of said bell-crank will be moved forward and with it rod 6, said rod being connected to arm 5 on shaft 22. Arms 23 on shaft 22 being connected to links 24 and 25, in moving arm 5 forward it lowers arms 23 and they depress links 24 and 25, pivoted on bolts 26 and 27. The depression of said links forces the two halves apart, and by moving the reverse-lever back to its central position the movements of the respective parts, as already set forth, will be in the op-



posite direction, and thus a contraction of the nozzle will take place.

If it should be desired to operate the nozzle independently of the reverse-lever and reach-rod, I unscrew set-screw 28. That will allow said reach-rod free movement without in any way interfering with bell-crank 7, as link 9 will have free movement in its slot or socket to work up and down. I also take out bolt 32 of bell-crank 7 and rod 6. Then by means of handle 8 I regulate the opening and closing of the tips and adjust said opening in any desired position by means of notches in said rod, on the same principle as shown in Patent No. 546,495, granted to me September 17, 1895.

Having thus described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. In an exhaust-nozzle for locomotive-engines the combination of a base having the inner edge or side projecting up so as to act as a guide, two square halves hinged to said base, the edges on one of said halves being provided with receptacles and covered at the top for the other half to interpose, a rod being secured to the upper ends of each half, which act as pivots for links attached thereto and connected to arms extending from a shaft journaled on brackets, made a part of and projecting from the base, a rod connected to the upper arm of said shaft, extending

back to the engine-cab the end of said rod being provided with a loop and notches on the under side of the rod close to the top to engage the wind-sheet or any suitable bracket, substantially as described and shown.

2. In an exhaust-nozzle the combination of a base provided with a guide on its inner side, two halves hinged on said base and adjacent to the guide, a square casing placed outside of the halves, links attached to the halves and to the arms of a shaft journaled on brackets made a part of the base and extending therefrom, a clamp placed on the reach-rod, a link provided with a slot or socket and set-screw attached to the clamp, a bell-crank pivoted at any suitable place on the boiler or about the engine-cab, a link connected to the lower end of the bell-crank and interposed into the slot or socket, a link attached to the clamp placed on the reach-rod, the upper end of said bell-crank being connected to the rod extending forward and connects to the upper arm of shaft connected to the tips of the nozzle by way of arms extending from the shaft and links, substantially as described and shown.

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

HANS OTTO OLSON.

Witnesses:

JOHN OLSON,  
JOHN REUTERBERG.