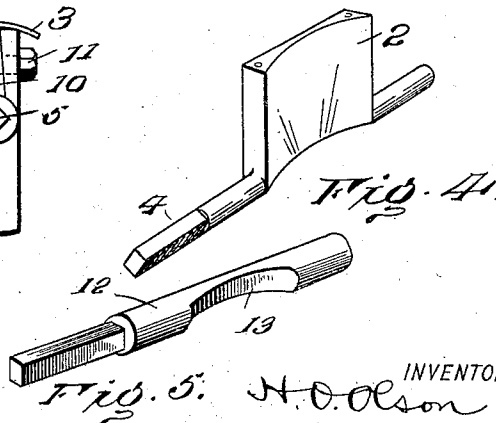
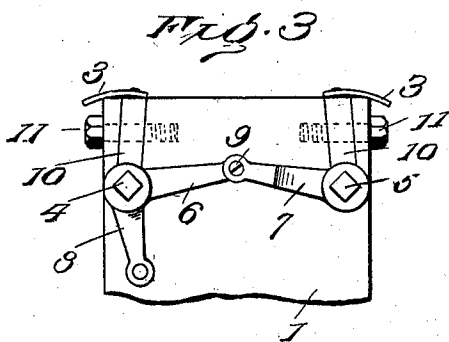
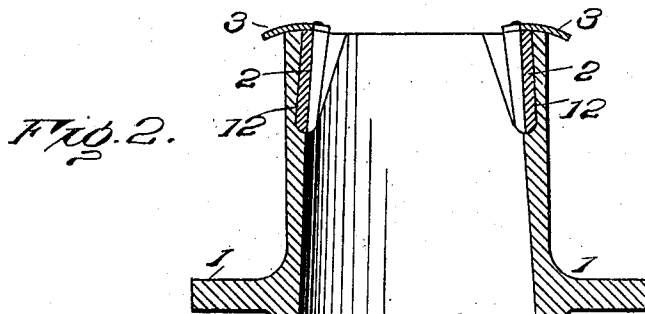
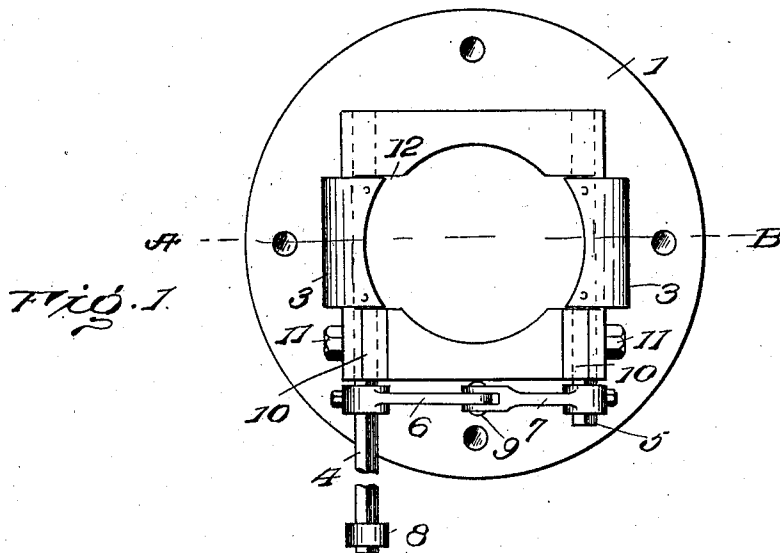


No. 824,039.

PATENTED JUNE 19, 1906.

H. O. OLSON.
NOZZLE FOR LOCOMOTIVES.
APPLICATION FILED JUNE 29, 1905.



WITNESSES:
[Signature]
C. P. Wright, Jr.

Fig. 5. H. O. Olson

INVENTOR
BY *[Signature]*
ATTORNEY

UNITED STATES PATENT OFFICE.

HANS OTTO OLSON, OF TWO HARBORS, MINNESOTA.

NOZZLE FOR LOCOMOTIVES.

No. 824,039.

Specification of Letters Patent.

Patented June 19, 1906.

Application filed June 29, 1905. Serial No. 267,643.

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 Variable Exhaust-
Nozzles for Locomotives, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in variable exhaust-nozzles for locomotives; and it consists of the improved features of construction and combination hereinafter described and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 is a top view of my improved nozzle. Fig. 2 is a cross-section on the line *a B*, Fig. 1. Fig. 3 is a side elevation of the upper portion of the nozzle, showing the manner in which the adjustable wings are operated; and Fig. 4 is a perspective view of one of the wings. Fig. 5 is a perspective view of a modified form of wing.

The exhaust-pipe from the cylinders of the locomotive may be of any suitable construction desired, to which is fitted my improved nozzle 1, which I prefer to make of a shape substantially as shown. In the upper portion of the two opposite side walls of the nozzle 1 are recesses 12, in which are journaled the adjustable wings 2 2, which are formed integral with the operating-shafts, as shown in Fig. 4. The backs of the wings 2 2 are formed with a flat surface when larger than the diameter of their journals, while their inner faces are of a tapering concave construction to as nearly as possible coincide with the inner form of the nozzle, their extreme upper and inner edges being an arc of the circle which forms the discharge-opening of the nozzle. Thus it will be seen that when the wings are brought forward to a choked position the discharge of the nozzle will be practically a circle, which is the most desirable form possible for the best results.

The wings 2 are provided with the caps 3, which are securely fastened to them for the purpose of covering the opening and preventing the collection of dirt or cinders between the side walls of the nozzle and the backs of the wings when the latter are moved forward.

The outside ends 4 and 5 of the wing-shafts are preferably of a square form for the reception of the crank-arms 6, 7, and 8, and in the drawings one is shown as of an indefinite

length, as it is designed to project out through the smoke-box of the locomotive, and the crank-arm 8 is attached to it outside of the smoke-box, to which arm in turn may be attached any suitable operating device in common use. The crank-arms 6 and 7 are securely fastened to the shafts 4 and 5 and at their inner ends are connected by means of the pin 9 in the one engaging within a slotted hole in the other, so that the motion will be applied to the two shafts simultaneously, and thus the wings made to open in unison.

For the purpose of inserting or removing the wings 2 2 the portions 10 10 of one of the side walls of the nozzle 1 are made removable and are retained in position by means of the bolts 11 11.

While I have shown the operating-levers 6 and 7 as being located close to the nozzle 1, it is evident that the shaft 5 may be extended equally as long as the shaft 4 and all of the operating-levers be located outside of the smoke-box, if considered any advantage, without departing from my invention.

The particular advantage in this form of construction is, first, the small proportion of discharge-opening disturbed for the purpose of varying the exhaust, as it is found in practice that the least the general shape of nozzle is changed the better; secondly, that forming the wing and shaft in one and hinging the wing from its lower edge provides a much more simple construction than heretofore used and also admits of varying the exhaust by changing the general shape of the interior of the nozzle as little as possible, the wings being quite short in proportion to the length of the nozzle.

In the modification shown in Fig. 5 of the drawings instead of providing the shaft 12 with the wing 2 I make the same perfectly round and provide it with the cut-away portion 13, so positioned in the nozzle that when said cut-away portion is in an inward position the walls thereof are unobstructed, but when turned a part of a revolution the solid portion projects inward and contracts the discharge end of the nozzle.

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

1. A nozzle comprising a casing having recesses in the opposite inner faces thereof, wings or shafts pivotally mounted within the recesses and having concaved inner faces, and caps secured to the upper end of said wings.

2. A nozzle comprising a casing having recesses in the opposite inner faces thereof, wings pivotally mounted within said recesses and having concaved inner faces, and caps secured to the upper ends of said wings and having concaved inner edges to correspond with concaved faces of the wings. 45
3. A nozzle comprising a casing, having recesses in the opposite inner faces thereof, wings pivotally mounted within the said recesses and having their opposite ends flush with the upper end of the casing, and caps secured to the upper ends of said wings and extending over the upper end of the casing. 50
4. A nozzle, comprising a casing having recesses in the opposite inner faces thereof, wings pivotally mounted within the said recesses and having their upper ends flush with the upper end of the casing, and caps secured to the upper ends of said wings and extending over the upper end of the casing, and having concaved inner edges to correspond with the concaved faces of the wings. 55
5. A nozzle, comprising a casing, having a round central bore through the same, the outer and inner faces of said bore having oppositely-arranged recesses, wings pivotally mounted within the lower end of said recesses, and extending up flush with the upper end of the casing, caps carried by said wings and closing said recesses, the pivots of said wings extending through the casing at one side, links rigidly connected to said pivots and pivotally connected together, a lever for operating one of said pivots whereby both pivots are operated and both wings are swung inward or outward, thus increasing or decreasing the size of the opening of the nozzle. 60
6. A nozzle, comprising a casing having recesses in the inner face thereof, wings or shafts pivotally mounted within the inner ends of said recesses and having concaved inner faces, and curved caps removably carried by the upper free ends of the wings on the outside of the casing and closing the upper end of said recesses. 65
7. A nozzle, comprising a casing having recesses in the opposite inner faces thereof, shafts mounted within the inner ends of said recesses and of a diameter greater than the depth of the recesses and having a curved cut-away portion corresponding to that of the inner face of the casing, and means for oscillating said shafts together. 70
8. A nozzle, comprising a casing having recesses in the opposite inner faces thereof, shafts mounted within the inner end of the said recesses and having upwardly-extending wings, caps removably supported by the upper ends of said wings, and removable blocks carried by one side of the casing above the shafts, whereby the shafts and wings may be readily removed. 75
9. A nozzle, comprising a casing, and shafts mounted in said casing and having curved cut-away portions corresponding to that of the inner face of the casing. 80
10. A nozzle, comprising a casing, and shafts mounted in the casing extending longitudinally across the casing and having curved cut-away portions corresponding to that of the inner face of the casing. 85
11. A nozzle, comprising a casing having semicircular recesses in the opposite inner faces thereof, and shafts mounted within the said recesses and having a curved cut-away portion corresponding to that of the inner face of the casing. 90
- In testimony whereof I affix my signature in presence of two witnesses.
- HANS OTTO OLSON.
- Witnesses:
C. A. YEMBERG,
B. F. FOWLER.