

C. L. BAKER.
ADJUSTABLE NOZZLE TIP.
APPLICATION FILED MAY 29, 1911.

1,042,070.

Patented Oct. 22, 1912.

3 SHEETS-SHEET 1.

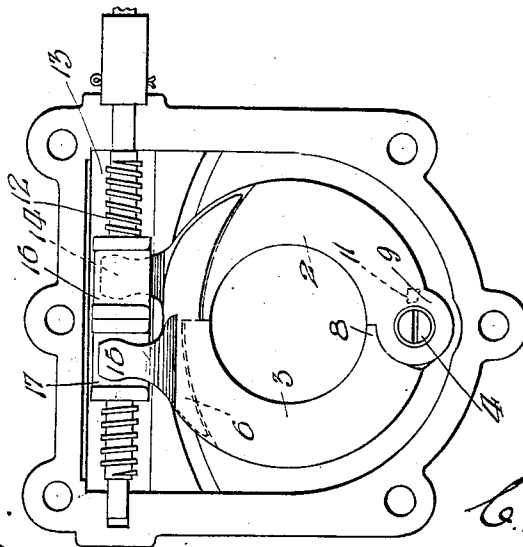
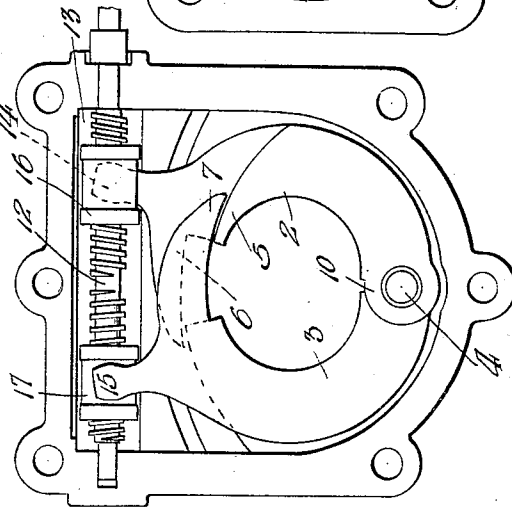
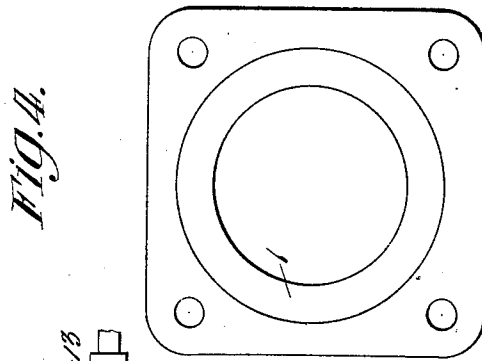


FIG. 1.

FIG. 2.

FIG. A.

WITNESSES

G. M. Spring.
A. B. Stevens.

INVENTOR

C. L. Baker.

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3 SHEETS-SHEET 2.

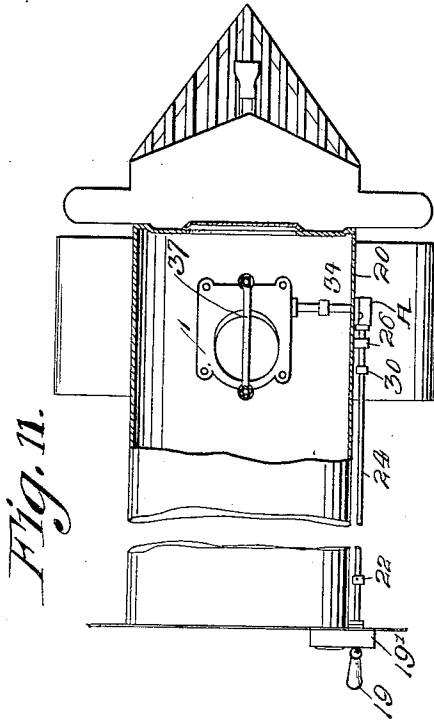
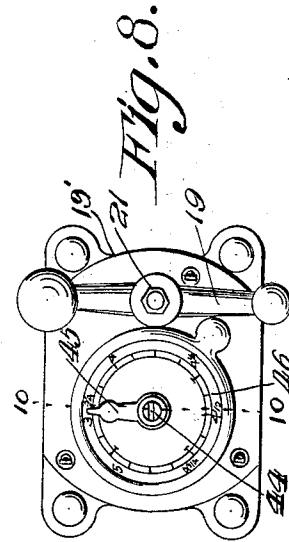
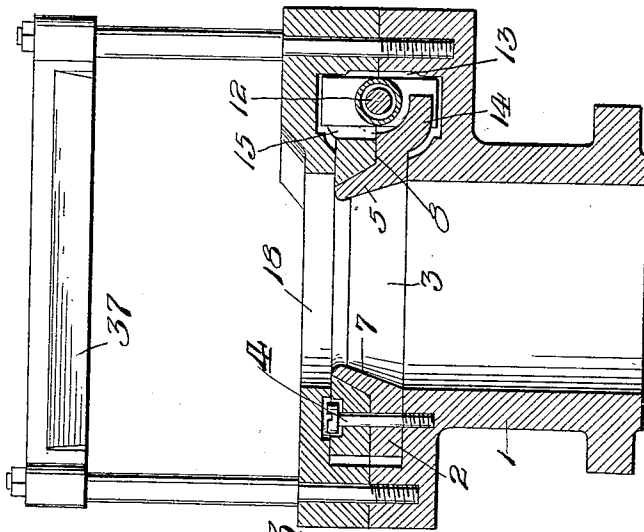
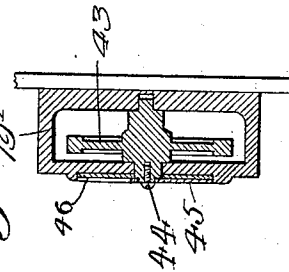


Fig. 10.



WITNESSES
S. M. Spring.
A. H. Clarke.

Fig. 9.

INVENTOR

Charles L. Baker.

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3 SHEETS—SHEET 3.

Fig. 7.

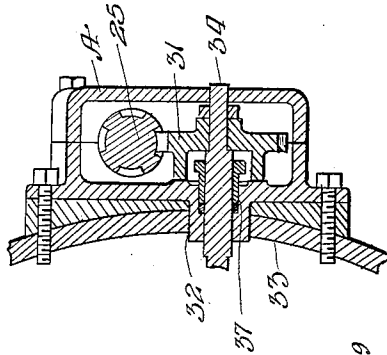


Fig. 9.

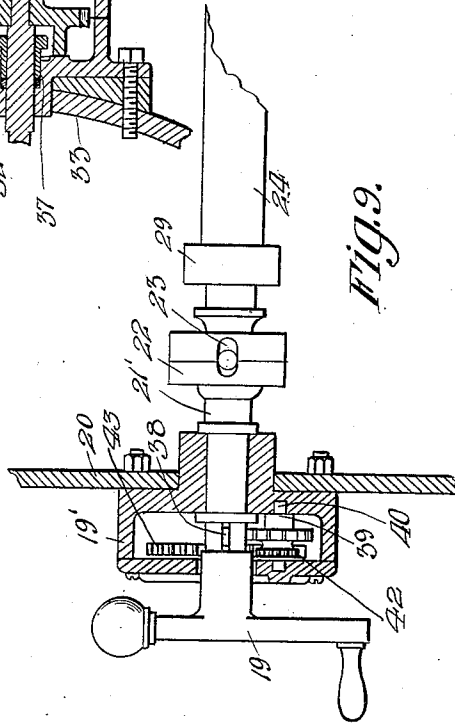


Fig. 5.

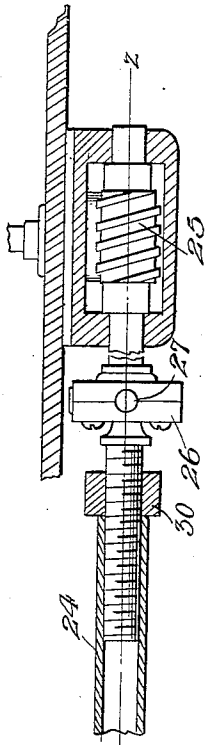
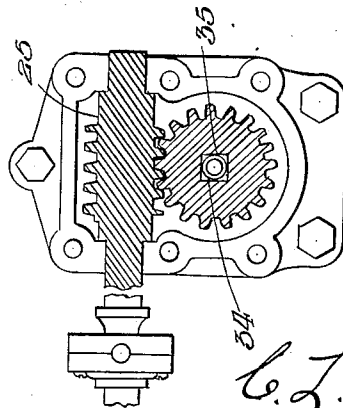


Fig. 6.



WITNESSES
S. M. Spring.
A. B. Slevens.

INVENTOR

C. L. Baker.

UNITED STATES PATENT OFFICE.

CHARLES L. BAKER, OF ST. JOSEPH, MISSOURI, ASSIGNOR OF ONE-HALF TO THOMAS T. LOGAN, OF ST. JOSEPH, MISSOURI.

ADJUSTABLE NOZZLE-TIP.

1,042,070.

Specification of Letters Patent.

Patented Oct. 22, 1912.

Application filed May 29, 1911. Serial No. 630,228.

To all whom it may concern:

Be it known that I, CHARLES L. BAKER, a citizen of the United States, residing at St. Joseph, in the county of Buchanan and State of Missouri, have invented certain new and useful Improvements in Adjustable Nozzle-Tips, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improvement in adjustable nozzle tips, and the primary object of the invention, is the provision of an adjustable nozzle tip, adapted to be used in all classes of steam boilers where a forced or accelerated draft is employed, where steam or air is employed, this particular device being instantly controllable at a distant point, and provided with means whereby the operator may instantly adjust the nozzle tip, and be advised of the position thereof.

A further object of the invention, is the provision of an adjustable nozzle tip adapted to be located in the smoke chamber of a locomotive to accelerate the draft of the boiler, and have its operating mechanism and visual indicator near the cab, or in an accessible place for manipulation by the fireman or stoker.

A still further object of the invention is the provision of a nozzle tip having two co-acting gates or valves, mounted so that any accumulation of gum, oil, soot, cinders or the like may be readily removed therefrom, and will offer no great resistance to the operation of the gates or valves, a simple and efficient means being provided to operate said gates or valves simultaneously.

With the foregoing objects in view, the invention resides in the arrangement and combination of parts, as hereinafter set forth and particularly pointed out in the claims.

In the accompanying drawings:—Figure 1 is a top plan view of the nozzle tip, with the steam spreader and lid removed. Fig. 2 is a similar view with the gates or valves open to the fullest extent. Fig. 3 is a vertical sectional view through the nozzle tip with the lid and steam spreader in operable relation thereto. Fig. 4 is a bottom plan view of the nozzle tip. Fig. 5 is a horizontal section through the intermediate gearing for operating the valves' worm. Fig. 6 is a vertical section on line $z-z$ of Fig. 5. Fig. 7 is a vertical central section thereof. Fig. 8

is a front elevation of the indicator and nozzle controlling handle. Fig. 9 is a transverse section through the same. Fig. 10 is a vertical section through the indicator and its main gear, said section being taken on line 10—10 of Fig. 8. Fig. 11 is a foreshortened top plan or partial plan and section of a locomotive with the present invention attached in operable relation.

Referring to the drawings:—The numeral 1 designates the nozzle tip proper, having the two nozzle gates or valves 2 and 3, respectively, mounted for co-action to regulate the discharge area through the nozzle, and pivoted for such action as at 4. The free ends of these gates or valves are provided with lap portion 5—6 upon gate or valve 2 and the overlap portion 7 upon gate 3. At the pivotal points these gates or valves are also provided with tight overlapping portions, whereby a tight joint is provided, the gate or valve 3 having the inner lap portion 8, while the lower lap portion 9 co-acts with the inner lower lap portion 10 and the upper lap portion 11, of the gate or valve 2. By means of the various lap portions of the two gates or valves, any leakage of the steam or air is prevented, and the said valves or gates are permitted to close only as far as indicated in Fig. 1, or open to the extreme as indicated in Fig. 2. These lap portions, it is evident will protect the pivot 4, and also the worm screw 12, mounted in the screw chamber 13, this worm screw 12, being provided with the oppositely disposed threads within the casing for the reception of the collars or sleeves 16 and 17, of the respective gates 2 and 3, each one of which is provided with its respective lug or finger 14 and 15, which is in operable engagement at all times between the collars of the respective sleeves 16 and 17, and within the worm chamber 13. It is therefore evident that the rotation of the worm 12 will move the sleeves 16 and 17, toward or away from each other, thereby closing or opening the two valves or gates 2 and 3, as desired. A lid 18 holds the worm 12 and the gates or valves in place, as shown in Fig. 3, and the steam spreader 37 is carried by the supports in front of the nozzle.

By reference to Figs. 8, 9 and 11, it will be seen that the nozzle or valves operating handle 19, is mounted for operation at a distant point from the nozzle, in this instance

the casing 19', is connected to wall 20 of a locomotive cab, in an accessible position to the fireman, the handle being mounted upon the end 21 of the operating shaft 21', connected by a universal joint 22 having an expansion slot 23, to the hollow pipe or operating rod 24, which is locked to the coupling or joint 22 by means of the lock nut 29. The forward end of the rod 24, as shown clearly in Fig. 5, is connected to a universal expansible joint 26, having the expansion slot 27, and locked thereto by means of the nut 30, the worm 25 mounted in its casing, being operably connected in this way to the shaft or rod 24, so as to form an intermediate power transmitting means between the handle 19, and the worm 12 of the nozzle tip. This worm 25 operates a gear 31 journaled in the casing 32, mounted upon the smoke arch or boiler side 33, the shaft 34 operated thereby being connected for operating the worm 12. The left hand end of the screw 12 is free to expand longitudinally, the bearing 37 permitting this, while the lugs or arms 14 and 15 of the respective valves or gates are also permitted a longitudinal expansion between the rims of their respective collars or sleeves 16 and 17.

The universal joints employed, are each provided with expansion slots, so that with all of the various points or connections, where expansion may happen, occasioned by the intense heat, provided with means for taking care of such expansion, the two gates or valves 2 and 3, and their operating mechanism will work with perfect freedom.

The shaft 21', Fig. 9, has a stud 38 mounted thereon, and this stud engages the gear 39, carried by the shaft 40, rotatably mounted in the indicator case 19'; and secured upon the shaft is the gear or pinion 42, meshing with the gear or pinion 43, formed with the shaft 44, rotatably mounted in the indicator casing 19'. The indicator point or hand 45, is secured on the outer end of the shaft 44, and co-acts with the dial 46, to give a visual indication to the fireman as to the position of the gates or valves 2 and 3, the said dial being protected by a glass, and having its indicators marked in inches, to give the area of nozzle tip open-

ing. It is apparent that any form or arrangement of gears may be used to operate the pointer 45, and it is therefore not thought necessary to go into detail on this point.

From the foregoing description, it is evident, that the two gates or valves 2 and 3, are at all times under complete control of the fireman, and that by means of the operating handle 19 and the indicating mechanism, that the exact positioning of the valves can be instantly set and indicated; and by reason of the various connections, and joints that the nozzle is very efficient, practical and durable.

What I claim, as new, is:—

1. A nozzle tip having a body with an opening therethrough, two coacting gates pivotally secured on the body of the tip for co-active movement to increase or decrease the area of said tip opening, a lug carried by each gate, a worm screw, and a collar mounted upon said screw, one to each lug for operating the gates when the worm is operated, a manually operated device at a distant point for operating said worm, and an indicator operated by said device for indicating the area of opening of the gates.

2. A nozzle tip having a body with an opening therethrough, a lid therefor, said lid and body forming a gate casing and a worm casing, two gates mounted in the gate casing, said gates having pointed co-acting free ends and interlocking pivotal ends pivoted in said casing and disposed to vary the area of the opening of the body, each one of said gates having a lug upon its free end, a worm screw disposed within the worm casing and having two oppositely disposed worm threads thereon, and a collar to each set of threads mounted upon the worm and operably engaging the lugs of the gates, manually operated means connected to the worm and operable from a distant point for controlling the movements of the gates.

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

CHARLES L. BAKER. [L. S.]

Witnesses:

AMY A. MCKAY,

B. J. CASTEEL.