June 12, 1923.

1,458,523

B. L. COUTANT

EJECTOR

Filed Nov. 30, 1921

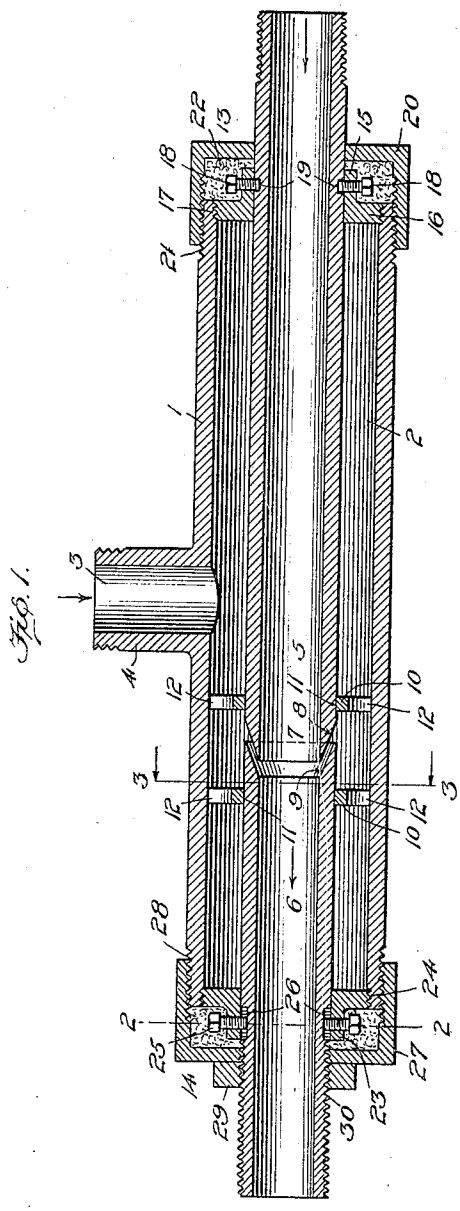


Fig. 1.

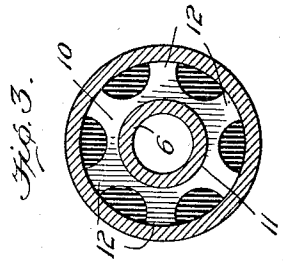


Fig. 3.

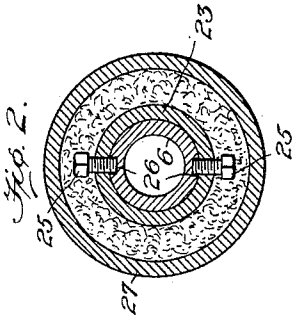


Fig. 2.

Witness

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UNITED STATES PATENT OFFICE.

BENONI L. COUTANT, OF JACKSONVILLE, FLORIDA.

EJECTOR.

Application filed November 30, 1921. Serial No. 518,910.

To all whom it may concern:

Be it known that I, BENONI L. COUTANT, a citizen of the United States, residing at Jacksonville, in the county of Duval and State of Florida, have invented certain new and useful Improvements in Ejectors; and I do hereby 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.

My invention relates to certain new and useful improvements in ejectors of a type wherein fluids or gases under pressure are utilized for effecting the bodily movement of material.

An object of the present invention is to produce an ejector of comparatively simple construction formed of a single casing or housing, the ends of which are easily packed against leakage and closed by novel end devices which serve to support the suction and discharge nozzles of the ejector and also maintain the packing out of contact with both the inducing medium and the material being moved.

Another object of the invention is the production of an ejector in which the cooperating suction and discharge nozzles are centrally supported in adjustable relation, one toward the other, the adjusting means being located within one of the end closures and readily operated without danger of distorting the effective relation of the nozzles or dislocating the packing and causing leakage.

A further object of the invention is to provide an ejector comparatively inexpensive to manufacture and to maintain, in that the several parts used are standard fittings, and the quantity of packing heretofore used is reduced to the minimum.

Other objects will in part be obvious, reference being had to the specification and claims hereto appended.

In the accompanying drawings in which I have illustrated an embodiment of my invention,

Figure 1 is a longitudinal sectional view through my improved ejector;

Figure 2 is a transverse sectional view on the line 2—2 of Figure 1; and

Figure 3 is a transverse sectional view on the line 3—3 of Figure 1.

My present invention has been designed with a view to producing an ejecting device capable of many uses, some of which are dredging, excavating, and cleaning or sweeping. I do not limit myself to any one use to which my invention may be applied, reserving also the right to make such changes in the construction and arrangement of the several parts as properly fall within my invention as hereinafter particularly defined.

Referring to the drawings, the ejector includes a sleeve casing 1 about the suction and discharge nozzles and serving to house the several parts in a compact and particularly neat manner. The interior of the sleeve forms the chamber 2 into which fluid, air or other gas is admitted under pressure through the inlet 3, the boss 4 of which is preferably formed integral with the sleeve 1 as shown. Any suitable conduit may be attached to the inlet, and the inducing material of the ejector admitted from any suitable source of supply (not shown).

Located within the sleeve 1 are two nozzles co-operatively associated and termed for purposes herein, a suction nozzle 5 and a discharge nozzle 6.

The suction nozzle 5 is relatively long and extends into the sleeve 1 a distance slightly beyond the inlet 3 as shown. The outlet end 7 of the suction nozzle 5 is beveled as shown at 8 and together with the inlet beveled end 9 of the nozzle 6 permits the forming of a hollow cone-like jet of fluid or gas in its passage from the chamber 2 through the discharge nozzle 6, thereby inducing suction in the nozzle 5 and movement of the material therethrough in the direction of the arrow shown in Figure 1.

The respective innermost ends of the nozzles 5 and 6 are spaced from and supported centrally of the sleeve 1 by means of the spider-like frame 10. Each spider is provided with an opening 11 into which the nozzle end is fitted, the arms or projections 12 bearing against the interior wall of the sleeve as shown. In practice these spider-like supports can be secured either to the nozzle when assembling and inserted within the sleeve, or they can be attached to the interior of the said sleeve and the nozzle ends inserted therethrough as will be understood. It will be seen however that a rigid support is provided for the respective ends of the nozzles which will not interfere with the free passage of the inducing medium in the chamber 2, and that the relative adjustment of the nozzles one toward the other is readily permitted without distorting the

alinement of said nozzles. This I regard as an important factor, and together with the additional nozzle supporting means now to be described, constitutes a simple and controllable feature for ejectors never before known.

The respective nozzles 5 and 6 extend through and are supported by novel end closure devices 13 and 14. The closure 13 comprises a collar 15 slidably mounted upon the nozzle 5, and provided with a threaded flange 16. The flange 16 screws into the interiorly threaded portion 17 of the sleeve 1. Set screws 18 pass through the collar 15 and engage the nozzle 5 and more especially slight depressions 19 formed therein. The collar 15 serves as a support for the nozzle 5 and the set screws permanently establish its relation to the sleeve as fixed or stationary.

Associated with the flanged collar 15 is a cap section 20 arranged and adapted to be threaded upon the exterior threads 21 of the sleeve 1. A packing material 22 is interposed between the collar 15 and the cap 20, the latter being screwed relatively tight against the packing to prevent leakage.

The end closure 14 is of similar construction and includes the flanged collar 23 having a threaded portion designed to be screwed into the interiorly threaded portion 24 of the sleeve 1. Set screws 25 pass through the collar 23 and are adapted to engage relatively long or groove-like depressions 26 formed in the sleeve 6. The nozzle 6 is slidably mounted in the collar 23 and is adjustably held therein by means of the set screws 25. A cap 27 is associated with the collar 23 and is screwed upon the exteriorly threaded end 28 of the sleeve 1. Packing material is interposed between the cap end and collar, said packing being easily introduced and removed from any direct contact with either the induction material or the substances being moved. A lock nut 29 is abutted against the cap 27 as shown, said nut being screwed upon the threaded portion 30 of the nozzle 6.

In operation, any fluid such as steam, or any gas such as air is admitted under pressure to the chamber 2 from where it finds its way in a hollow cone-like spray between the interior and exterior beveled ends 8 and 9 of the nozzles 5 and 6. The angle of the bevels induces forward travel of the spray in the direction of the arrow strong enough to produce suction in the nozzle or pipe 5. The material being moved is drawn or sucked through the nozzle 5 and discharged along with the current of the inducing material out of the discharge nozzle 6. Any suitable connection can be attached to the nozzle 6 for facilitating the delivery of the material to the desired destination. For instance, in cleaning cars, as an example, I attach a hose to the nozzle 6 and allow same to hang out the car window. I then direct a current of compressed air from the air line of the car through the ejector as the inducing medium, connecting a suitable suction nozzle to the threaded end of the pipe or nozzle 5.

In regulating the flowing intensity of the inducing medium, the cap 27 is unscrewed and the set screws 25 loosened, whereupon the nozzle 6 can be moved toward or away from the nozzle 5. This movement is effected longitudinally of the ejector and by reason of the collar and spider supports does not permit of any change in the longitudinal alinement of the nozzles, thereby keeping the annular spray opening of uniform contour, but varying necessarily the quantity of induction material admitted.

I prefer to have but one of the nozzles adjustable, but it will be understood that I do not limit myself to the one shown and described herein. In some cases both of the nozzles 5 and 6 may be movably associated toward and away from each other.

Having thus described my invention what I claim is:

1. An ejector including a casing formed of a cylindrical sleeve having internal and external screw-threaded ends, closure devices for the ends of said sleeve, each of said devices comprising a flanged collar secured within the internal threads of the sleeve and a cap secured upon the external threaded portions of said sleeve, packing material interposed between said collar and cap, and cooperating cylindrical ejecting nozzles arranged within said sleeve and supported by the closure devices.

2. An ejector including a casing formed of a cylindrical sleeve having internal and external screw threaded ends, closure devices for the ends of said sleeve, each of said devices comprising a flanged collar secured within the internal threads of the sleeve and a cap secured upon the external threaded portions of said sleeve, packing material interposed between said collar and cap, cooperating cylindrical ejecting nozzles arranged within said sleeve and supported by the closure devices, and means for adjusting said nozzles toward and away from each other.

3. An ejector including a casing formed of a cylindrical sleeve having internal and external screw threaded ends, closure devices for the ends of said sleeve, each of said devices comprising a flanged collar secured within the internal threads of the sleeve and a cap secured upon the external threaded portions of said sleeve, packing material interposed between said collar and cap, cooperating cylindrical ejecting nozzles arranged within said sleeve and supported by the closure devices, and means for adjust-

ing said nozzles toward and away from each other, said means being located between the collar and cap portions of one of the end closure devices.

4. An ejector including a casing formed of a cylindrical sleeve, closure devices for the ends of said sleeve, said closure devices being formed of spaced sections, packing material interposed between said sections, cooperating cylindrical nozzles arranged within the sleeve and having one end thereof supported by the aforesaid closure devices, and means for supporting the other ends of said nozzles within the sleeve and in close proximity to the spray opening formed between the nozzles.

5. An ejector including a casing formed of a cylindrical sleeve, closure devices for the ends of said sleeve, said closure devices being formed of spaced sections, packing material interposed between said sections, cooperating cylindrical nozzles arranged within the sleeve and having one end thereof supported by the aforesaid closure devices, means for supporting the other ends of said nozzles within the sleeve and in close proximity to the opening formed between the nozzles, and means for effecting the adjustment of one of said nozzles longitudinally of the sleeve, said nozzle being maintained in longitudinal alinement with the other nozzle by means of the supports aforesaid.

6. An ejector comprising a cylindrical casing formed with a chamber, closure devices for the ends of said casing, cooperating cylindrical suction and discharge nozzles arranged within the aforesaid chamber and extending through the closure devices in which they are supported, other supports for said nozzles near their inner ends, packing material for the said closure devices, said packing being maintained out of contact with the interior of the said chamber and the passageways in said nozzles, and means for admitting an inducing medium to the aforesaid chamber.

7. An ejector including a tubular casing of the same width throughout its extent and provided intermediate its ends with means for admitting an inducing medium to the interior of the same, a suction nozzle of less diameter than said casing and of the same diameter throughout its extent, extending into said casing and provided at its inner end with an outer beveled surface, a spider supporting the inner end of said nozzle and permitting the same to be adjusted axially within the casing, means for packing and closing the space between one end of said casing and the outer surface of said nozzle, a discharge nozzle of the same diameter throughout its extent, extending into said casing and having an internal beveled face arranged adjacent to the beveled outer surface of the first mentioned nozzle and spaced from the latter, a spider supporting the inner end of the discharge nozzle and adapted to permit adjustment of the discharge nozzle axially within said casing, and means for packing and closing the space between the other end of said casing and the discharge nozzle.

8. An ejector including a casing formed of a section of pipe provided at its ends with internal and external screw-threads, and having means intermediate its ends to admit an inducing medium to the interior of the same, flanged collars engaging the internal threads of said casing, caps engaging the external threads of said casing and spaced from the collars to provide packing chambers, packing material arranged in said chambers, a suction nozzle formed of a section of pipe, extending through the collar and cap at one end of said casing and provided at its inner end with an outer beveled surface, a spider supporting the inner end of said nozzle and permitting axial adjustment of the latter, a discharge nozzle formed of a section of pipe, extending through the collar and cap at the other end of said casing and provided at its inner end with an internal beveled surface arranged adjacent to and spaced from the outer beveled surface of the suction nozzle, and a spider supporting the inner end of the discharge nozzle and permitting axial adjustment of the latter.

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

BENONI L. COUTANT.

Witnesses:
H. C. BARNES,
L. M. MAIER.