E. HAHN.

ASH EJECTOR.

APPLICATION FILED DEC. 10, 1919.

1,420,544. Patented June 20, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

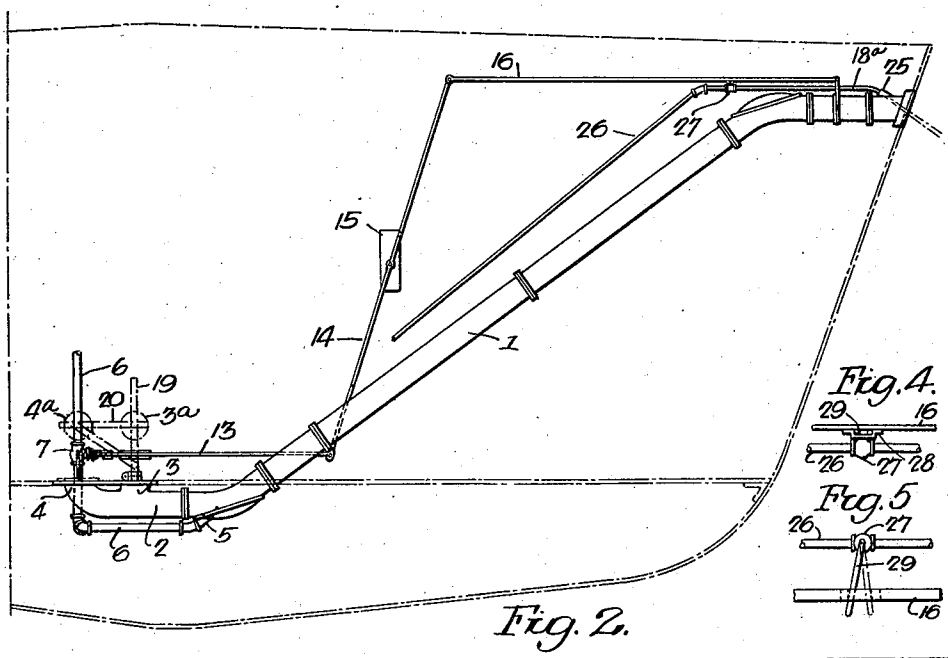


Fig. 4.

Fig. 5

Fig. 2.

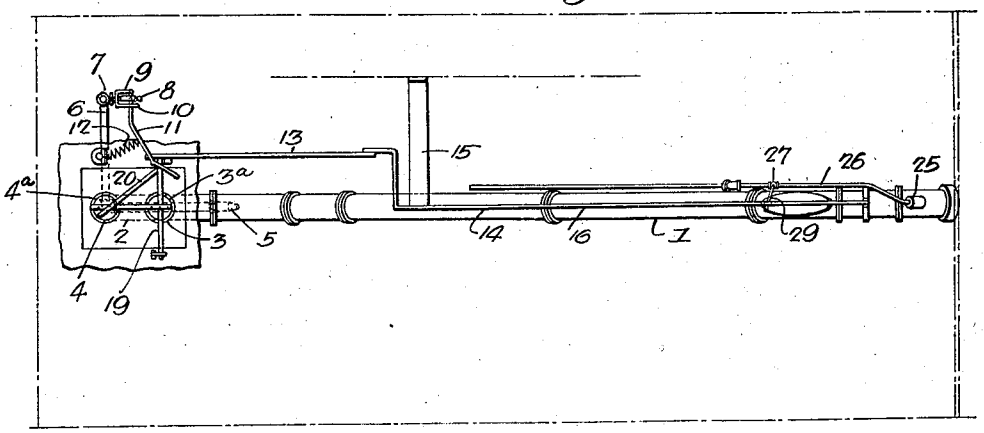
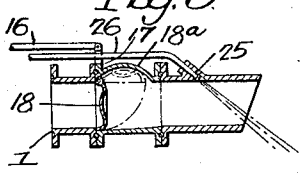


Fig. 3



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2 SHEETS—SHEET 2.

Fig. 6.

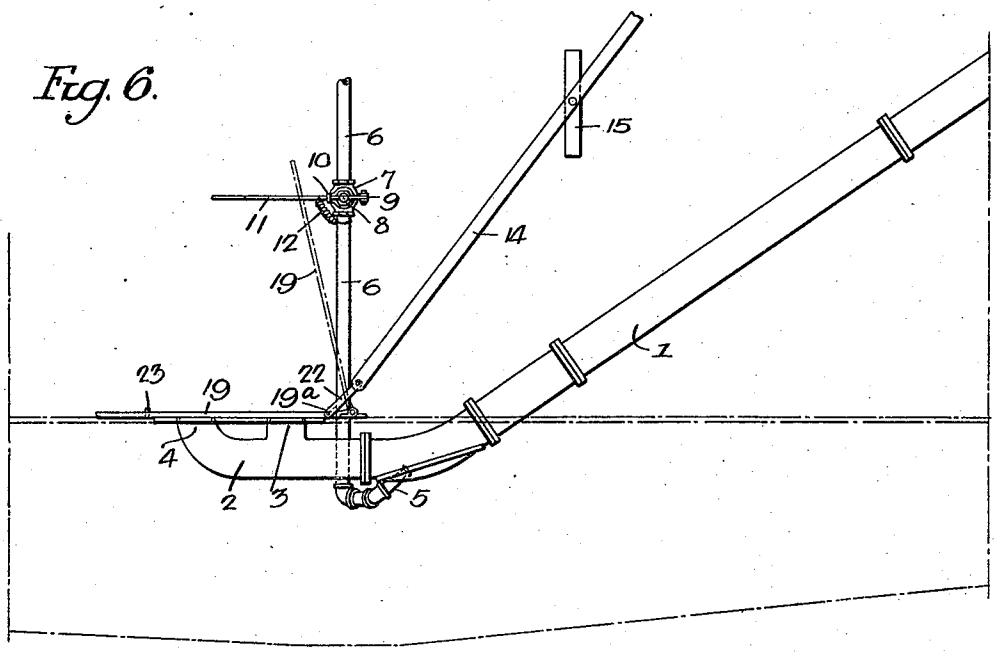
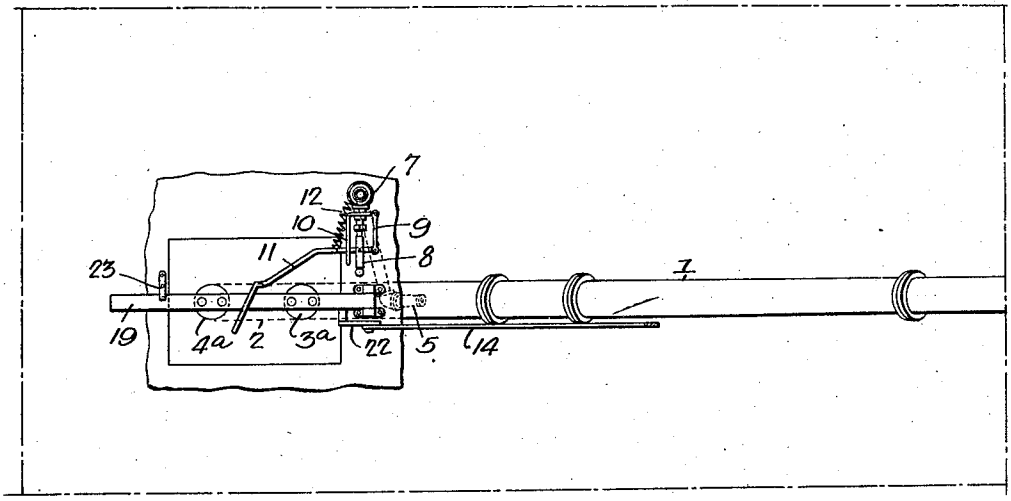


Fig. 7.



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UNITED STATES PATENT OFFICE.

EUGENE HAHN, OF PHILADELPHIA, PENNSYLVANIA.

ASH EJECTOR.

1,420,544. Specification of Letters Patent. **Patented June 20, 1922.**

Application filed December 10, 1919. Serial No. 343,785.

To all whom it may concern:

Be it known that I, EUGENE HAHN, a citizen of Hungary (having declared my intentions of becoming a citizen of the United States), residing in Philadelphia, Pennsylvania, have invented certain Improvements in Ash Ejectors, of which the following is a specification.

My invention relates to ash ejectors, and the object of my invention is the provision of certain improvements in conveyors of the type forming the subject of my co-pending application, Serial No. 332,949, in which I have described an ash ejector of the suction type adapted to use on vessels and the like, and having a closure cap provided for the outer extremity of the ejector pipe, said cap being so interconnected with the valve controlling the flow of steam, compressed air or other fluid into the ejector duct that the opening and closing of the one involves the opening and closing of the other.

My present invention comprises mechanism whereby the simple movement of a single actuating member either throws the ejector into operation or completely shuts it off, said single actuating member not only controlling the flow of fluid through the duct but the various closures as well, as will hereinafter be more fully described.

In the accompanying drawings:

Figure 1, is a side elevation of my improved ejector;

Fig. 2, is a plan view of the ejector;

Fig. 3, is a vertical section of the ejector duct showing the outer closure;

Figs. 4 and 5, are, respectively, a side elevation and plan view showing the details of the connection between operating rods and water valve, and

Figs. 6 and 7, are, respectively, a side elevation and plan view of a modification of my device.

With reference to the drawings, the ejector consists of an inclined duct 1, having at the lower end thereof a substantially horizontal portion 2, having therein an ash inlet opening 3 and an air inlet 4. A nozzle 5 extends through the base of the duct at the point where the said duct begins to incline upwardly; the axis of the nozzle being parallel to the inclined portion of the duct. The nozzle 5 is connected with a suitable source of fluid pressure, such for instance as a steam line or air compressing apparatus, by means of a feed pipe 6, which in the present instance extends upwardly at one side of the ejector, and has located in the said vertical portion a valve 7, which controls the flow of the fluid through the pipe. An operating spindle 8 of the valve 7 extends from the said valve laterally, and the arms 9 and 10 secured to the valve body extend also laterally, one on each side of and parallel to the said valve stem 8. An operating rod 11 pivotally connected to the arm 9 at the outer extremity thereof is also pivotally secured to the spindle 8 and passes through a slot in the arm 10; this arrangement being such that motion of the said operating rod 11 in a substantially horizontal plane will either open or close the valve 7. A spring 12, attached at one end to the said rod 11 and secured to a fixed frame at the other extremity tends to retain the rod in a position in which the valve 7 is closed.

Secured to the rod 11 intermediate the ends thereof is a connecting rod 13; the outer extremity of the connecting rod 13 being pivotally secured to the extremity of a rod 14 pivotally mounted at a point intermediate its ends to a fixed frame or bracket indicated by the reference numeral 15. To the upper extremity of the rod 14 is pivotally attached a rod 16, which is secured at its other end to a lever arm 17 secured to the pivotally mounted closure 18 in the ejector duct 1. The closure 18 may be of any type desired, but in the present instance I have shown it in the nature of a valve located within the duct and adapted to be swung up into a cavity 18^a in the roof of the pipe. It will be seen that any motion of the arm 11 in a direction designed to open the valve 7 will, through the medium of the connecting rods 13, 14 and 16, and the lever arm 17, swing open the pivotally mounted closure 18 located at the outer end of the duct. The spring 12 which normally holds the valve 7 closed, similarly operates to retain the closure 18 also closed.

In the present instance, I have shown the arm 11 extending from the valve 7, bending slightly to the right, and a bar 19 pivotally mounted in the floor at one side of the said ejector is so positioned that when the free end thereof is raised upwardly, the said rod will come in contact with the outer portion of the arm 11, the action between the said arm and the bar 19 being such as to move the arm 11 to open the valve 7 and the closure 18. Suitable means are provided to

retain the bar 19 in the elevated position, in which position it will hold the arm 11 in position opening the said valve and closure.

The bar 19 is so located as normally to lie directly across the ash inlet opening 3 in the pipe 1, and in this position the said bar may be locked down by a suitable locking device located in the floor adjacent the outer end thereof, thereby prohibiting removal of the cap 3^a which is adapted to close the opening 3.

In my present invention, I propose to secure the said cap 3^a to the bar 19 so that elevation of the said bar will uncover the hole 3. By means of outrigger arms 20 extending from the bar 19 laterally over the air inlet opening 4 in the pipe 1, to which outrigger arms the cap 4^a normally closing said opening is attached, I am enabled to open and close the air inlet opening simultaneously with the ash intake opening 3.

From this description, it will be seen that with the elevation of the rod 19, the various openings in the ejector duct 1 are thrown open, and at the same time a stream of the operating fluid, such as it may be, is injected into the duct of the pipe 6 and the nozzle 5. So long as the rod 19 is retained in the elevated position, the ejector remains in operation, but with the lowering of the rod 19, the operating fluid is shut off through closing of the valve 7, and the same time the closure 18 and the plugs 3^a and 4^a are brought to their respective seats, thereby effectually sealing the duct 1 at all points and making the same substantially watertight at both extremities.

At the outer end of the duct 1, I have shown a nozzle 25 extending through the wall of the duct. The nozzle 25 is attached to a water pipe 26, and a conical plug or similar valve 27 controls the flow of water therethrough. The purpose of this nozzle is to discharge a jet of water through the end of the duct, as indicated in Fig. 3, thereby to a great extent eliminating the dust from the ashes which would otherwise settle upon the sides and surfaces of the boat.

I have shown means interconnecting the rod 16 and valve 27 whereby the said valve may be operated in conjunction with the opening of the closure 18, and therefore also in conjunction with the valve 7 and the closures 3 and 4. The said interconnecting means consists of a bracket 28 attached to the rod 16, between which and the rod is loosely held the outer end of a lever 29 which controls the opening and closing of the valve 27. Thus the movement of the rod 16 in opening the closure 18 causes also the opening of the valve 27 with a resulting discharge of water through the nozzle 25.

In Figs. 6 and 7, I have illustrated a modified form of my invention, in which the arrangement is such that the bar 19 extends over the openings 3 and 4; the operating arm 11 of the valve 7 being so located and arranged as to be engaged by the said bar 19 when the same is elevated. In this instance, I have shown the rods which govern the opening of the closure 18 connected directly to the bar 19 by means of a link 22. The point where the said link joins the bar 19 is at a point above the pivot 19^a of the bar, so that when the outer end of the bar 19 is elevated, the rod 14 is swung on its pivotal mounting in such a manner that the closure 18 is opened. As the bar is elevated, it contacts with the outer end of the arm 11, and in the manner already explained opens the valve 7.

Suitable means are provided for retaining the bar 19 in the elevated position in which the conveyor is in operation. When the bar 19 is lowered, it first passes from contact with the arm 11, which is pulled back to its normal position in which the said valve is closed by means of the spring 12, and the bar 19 being completely lowered, there results the closing of the closure 18 and of the two intake inlet openings 3^a and 4^a, all in the manner previously explained. A spring retainer 23 is located adjacent the outer end of the rod 19 and retains the rod in the normal horizontal position.

The advantages of a structure of this sort are numerous. In the first place, a single motion of a single element puts the ejector into operation and opens the valves and the various plugs and closure caps which normally seal the ejector pipe, while the opposite movement of the said single element accomplishes a shutting down of the active elements of the ejector and at the same time the sealing of the ejector pipe; this interconnected mechanism rendering the ejector substantially fool-proof and safe for use in vessels where conservation of power is a prime necessity.

I claim:

1. An ejector comprising a tubular duct having discharge and inlet openings, closures for said openings, means for injecting a stream of fluid into said duct, a valve controlling the flow of said fluid, and a single control element for simultaneously opening and for simultaneously closing said closures and said valve.

2. An ejector for ash and like material comprising a duct having discharge and inlet openings for said material, closures for said openings, a single element for effecting simultaneous opening and simultaneous closing of said closures, and means for injecting a fluid into the duct to transfer the said material from the said inlet to the discharge opening.

3. An ejector for ash and like material comprising a duct having discharge and inlet openings for said material, closures for said

openings, a single control lever manipulation of which effects simultaneous opening and simultaneous closing of said closures, and means for injecting a fluid into the duct to transfer said material from the said inlet to the discharge opening.

4. An injector comprising a tubular duct having discharge and inlet openings, closures for said openings, means for injecting a stream of fluid into said duct, a valve controlling the flow of said fluid, and a single control lever manipulation of which effects simultaneous opening and the simultaneous closing of both the closures and the said valve.

5. An ejector comprising a tubular duct having discharge and inlet openings, closures for said openings, means for injecting a stream of fluid into said duct, a valve controlling the flow of said liquid, means for obtaining a flow of liquid at the discharge opening of the duct, a valve controlling the flow of said liquid, and a single control lever manipulation of which effects the simultaneous opening and the simultaneous closing of said closures and valves.

6. An ejector comprising a tubular duct having discharge and inlet openings, means for injecting a stream of fluid into said duct, means for obtaining a flow of liquid at the discharge opening of the duct, and a single control element for simultaneously starting and simultaneously shutting off the flow of said fluid and said liquid.

7. An ejector comprising a tubular duct having discharge and inlet openings, a closure for said discharge opening, means for injecting a stream of fluid into said duct, a valve controlling the flow of said fluid, said valve and closure being interconnected so that they open and close coincidently, an operating lever for accomplishing the opening and closing of said valve and closure, and a closure for said inlet opening carried by said operating lever, and adapted, when the lever is in position to open the valve and discharge closure to uncover the said inlet opening.

8. An ejector comprising a tubular duct having discharge and inlet openings, a closure for said discharge opening, means for injecting a stream of fluid into said duct, a valve controlling the flow of said fluid, an operating lever for accomplishing the opening and closing of said valve and closure, and a closure for said inlet opening carried by said lever, and adapted, when the lever is in position to open the valve and discharge closure, to uncover the said inlet opening.

9. An ejector comprising a tubular duct having discharge and inlet openings, a closure for said discharge opening, means for injecting a stream of fluid into said duct, a valve controlling the flow of said fluid, an operating lever for accomplishing the opening and closing of said valve and closure, means normally retaining said valve and closure in closed position, a closure for said inlet opening carried by said operating lever and adapted, when the lever is in position to open the valve and discharge closure, to uncover the said inlet opening, and means for retaining the operating lever in position holding said inlet closure to its seat.

10. An ejector comprising a tubular duct having discharge and inlet openings, closures for said openings, means for injecting a stream of fluid into said duct, a valve controlling the flow of said fluid, a single element for effecting the simultaneous opening and the simultaneous closing of said closures and valve, and means for normally retaining said valve and closures in closed position.

11. An ejector comprising a tubular duct having ash inlet and discharge openings and an independent inlet opening for air, closures for said openings, means for injecting a stream of fluid into said duct, a valve controlling the flow of said fluid, and a single operating lever for effecting the simultaneous opening and the simultaneous closing of said valve and closures.

12. An ejector comprising a tubular duct having ash discharge and inlet openings and an inlet opening for air, means for injecting a stream of fluid into said duct, a valve controlling the flow of said fluid, a closure for said discharge opening, means interconnecting said valve and closure whereby the opening of one is coincident with the opening of the other, an operating lever for opening and closing said valve and closure, and closures for said ash inlet and air inlet openings carried by said operating lever, and adapted, when the lever is in position to open the valve and discharge closure, to uncover the said inlet opening.

13. An ejector comprising a tubular duct having inlet and discharge openings, means for injecting a stream of fluid into said duct, a valve controlling the flow of said fluid, a closure for said discharge opening, an arm carried by said valve whereby the same may be opened and closed, apparatus attached to said arm for opening and closing said closure coincidently with the opening and closing of said valve, a pivoted operating lever adapted to engage the said arm and opening and closing said valve and closure, and a closure for said inlet opening carried by said operating lever, and adapted, when the lever is in position to open the valve and discharge closure, to uncover the said inlet opening.

14. An ejector comprising a tubular duct having discharge and inlet openings, means for injecting a stream of fluid into said

duct, a valve controlling the flow of said fluid, an arm carried by said valve for opening and closing same, a closure for said discharge opening, apparatus for opening and closing said closure connected with said arm, a spring secured to said arm and tending to hold the valve and closure in closed position, a pivoted operating lever adapted to engage said arm to open and close said valve and closure, means for retaining said operating lever in position holding said valve and closure in the open position, a closure for said inlet opening carried by said operating lever and adapted, when the lever is in position to open the valve and discharge closure, to uncover the said inlet opening and means for locking said operating lever so as to hold the said inlet closure to its seat.

EUGENE HAHN.