No. 773,665. PATENTED NOV. 1, 1904.

J. D. MURRAY.

SAND BLAST APPARATUS.

APPLICATION FILED OCT. 29, 1903.

NO MODEL.

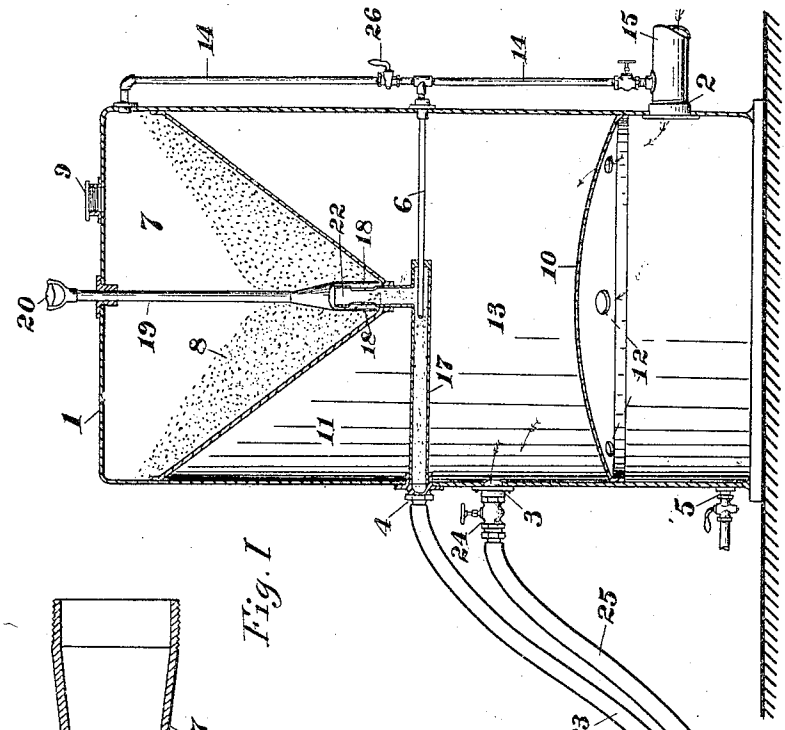


Fig. I

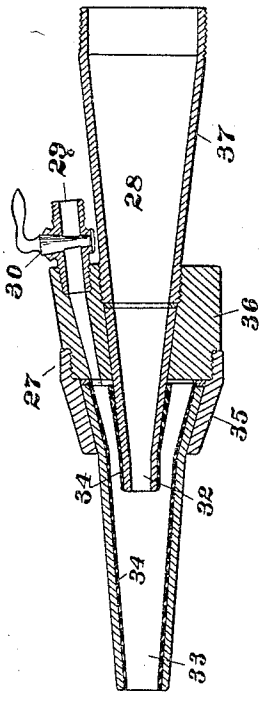
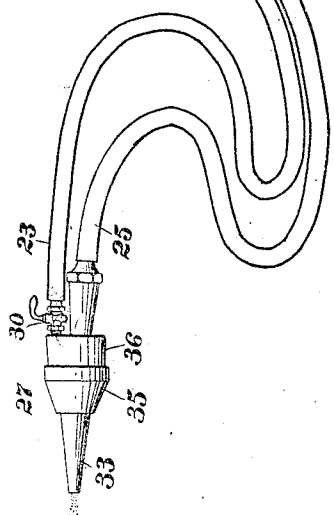


Fig. II



WITNESSES:

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No. 773,665. Patented November 1, 1904.

UNITED STATES PATENT OFFICE.

JOHN D. MURRAY, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO MARINE CONSTRUCTION CO., A CORPORATION OF CALIFORNIA.

SAND-BLAST APPARATUS.

SPECIFICATION forming part of Letters Patent No. 773,665, dated November 1, 1904.

Application filed October 29, 1903. Serial No. 179,080. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. MURRAY, a citizen of the United States, residing at San Francisco, county of San Francisco, and State of California, have invented certain new and useful Improvements in Sand-Blast Apparatus; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to certain improvements in apparatus for cleaning by the abrasive action of sand or like material the surface of structural metal plates, beams, or other parts, removing therefrom the oxidized scale or other substance adhering thereto, commonly called "sand-blast" apparatus.

My improvements consist in an inclosed receiver subjected to air-pressure, containing chambers for air and sand, having eduction-ways for each, and connected nozzles in which these are incorporated and projected forcibly against the material to be treated; also, consists in a peculiar form of nozzle with renewable parts and means of regulating the relative quantities of the air and sand.

The object of my invention is to scour and clean metallic surfaces, especially in places difficult of access, such as the interior of the hulls of ships and vessels of all kinds.

In the application of what is called the "sand-blast" to various purposes there are impediments to be overcome, as in the moisture and packing of the abrading material, the wear of nozzles subjected to scour, and regulation of the quantity of sand in proportion to the conducting medium. To meet these impediments, I provide apparatus as shown in the drawings herewith forming a part of this specification.

Figure I is an elevation, partly in section, of an apparatus constructed according to my improvements; and Fig. II, an enlarged longitudinal section through a nozzle to apply the sand or other scouring substance.

The main vessel 1, hereinafter called the "receiver," is of cylindrical form, strong enough to withstand the required internal pressure, and is provided with a closed chamber 7 at the top for dry sand, supplied through a closable passage 9. Said chamber has a conical or hopper-shaped bottom, from which the sand is discharged into the compartment below through discharge-pipe 22. The discharge is controlled by a valve 18, preferably of revoluble or lantern form, operated from above by a stem 19 and handle 20.

13 is the central chamber for air, divided from a still lower chamber by a diaphragm 10, preferably arched or dome-shaped, and perforated with apertures 12 to admit diffused air to said central chamber from the lower chamber 16.

2 is the inlet for air to said lower chamber, supplied by pipe 15, and 5 is a cock for drawing off the moisture of condensation.

The central chamber 13 is provided with a sand-pipe 17, connected to discharge-pipe 22 and terminating in the shell of the receiver, where the flexible sand-hose 23 is attached at 4. There is an air-outlet also at 3, with air-controlling cock 24, and a flexible air-hose 25 leads from this outlet to the discharge-nozzle 27. (Shown on an enlarged scale in Fig. II.)

A branch pipe 14 leads from the main air-supply pipe 15 to the upper chamber 7 for occasional use, as hereinafter explained, controlled by means of cock 26. A lateral branch 6 leads from pipe 14 to enter the larger sand-pipe 17, terminating beneath the discharge-pipe 22 in such manner as to form an ejector to drive the sand falling through pipe 22 forcibly through pipe 17 into the flexible hose 23, connected to the nozzle 27 at 29, with a force derived from the air-pressure in pipe 15 corresponding to that of the air-current in flexible air-pipe 25, derived from the similar pressure in the central air-chamber 13. These two currents or blasts combine and mingle in the nozzle 27.

In case the lantern-valve 18 or the contiguous passages should become clogged to impede the free discharge of sand the cock 26 may be opened to temporarily throw air-pressure into the upper chamber 7, thereby increasing the pressure therein, thus aiding to loosen and expel the clogged sand through the lantern-valve 18 into ejector-pipe 17.

The nozzle 27 is of a compound form, having passages 28 and 29 for air and sand, respectively, with a cock 30 for controlling the latter.

32 is the nozzle for air, and 33 the nozzle for combined air and sand, the exterior of one and the interior of the other being covered with renewable surfaces 34, of india-rubber or other material, that will resist the abrasive action of the sand. The nozzle 33 is removable by means of the screw-collar 35, and the nozzle 32 is removed by detaching the part 36 from the tube 37.

The operation is as follows: The chamber 7 is filled with sand, and air under pressure enters through the pipe 15. The valve 24 is opened, also the valve 18 and cock 30, to admit sand, which is forcibly ejected from the nozzle 33 against the surfaces to be acted upon. Any moisture from the air that collects within the receiver 1 is precipitated on the diaphragm 10, runs down into the chamber 16, and is drawn off at the cock 5. This diaphragm 10 also baffles and precipitates any moisture entering from the pipe 15.

Having thus explained the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In sand-blast apparatus, a receiver and means to maintain air-pressure therein, a sand-hopper inclosed in said receiver, with means to admit air-pressure to the said hopper, a sand-valve in the bottom of said hopper, with means for operating said valve from outside the receiver, and a sand-ejector in said receiver beneath said hopper, communicating with the latter by means of said valve, substantially as specified.

2. In sand-blast apparatus, a receiver having a main chamber, and a sand-hopper for an upper chamber, means to maintain air-pressure in said main chamber, means to admit air-pressure to the sand-hopper, an opening from the sand-hopper to said main chamber, a sand-valve in said opening, means to operate said sand-valve from outside the receiver, a sand-ejector in the main chamber of said receiver, a flexible pipe attached to said ejector, and an applying-nozzle on the end of said flexible pipe, substantially as specified.

3. In sand-blast apparatus, an applying-nozzle for delivering air and sand, said nozzle having a central discharge way or passage for air, with a flexible pipe leading thereto, a sand-discharge way or passage standing obliquely to the axis of the air-passage, and a cock on the nozzle to regulate the discharge at the sand-passage, substantially as specified.

4. In sand-blast apparatus, an applying-nozzle for delivering air and sand, said nozzle being provided with removable tips lined on the surfaces exposed to the action of the sand with elastic material to prevent abrasion, substantially as specified.

5. In sand-blast apparatus, an applying-nozzle having separate relatively convergent passages for air and sand respectively, a cock on the nozzle to regulate the discharge of sand from the sand-passage, the passages being provided with elastic protective coverings on those surfaces exposed to abrasion from the sand, and separate flexible pipes leading to said air and sand passages respectively, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN D. MURRAY.

Witnesses:
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