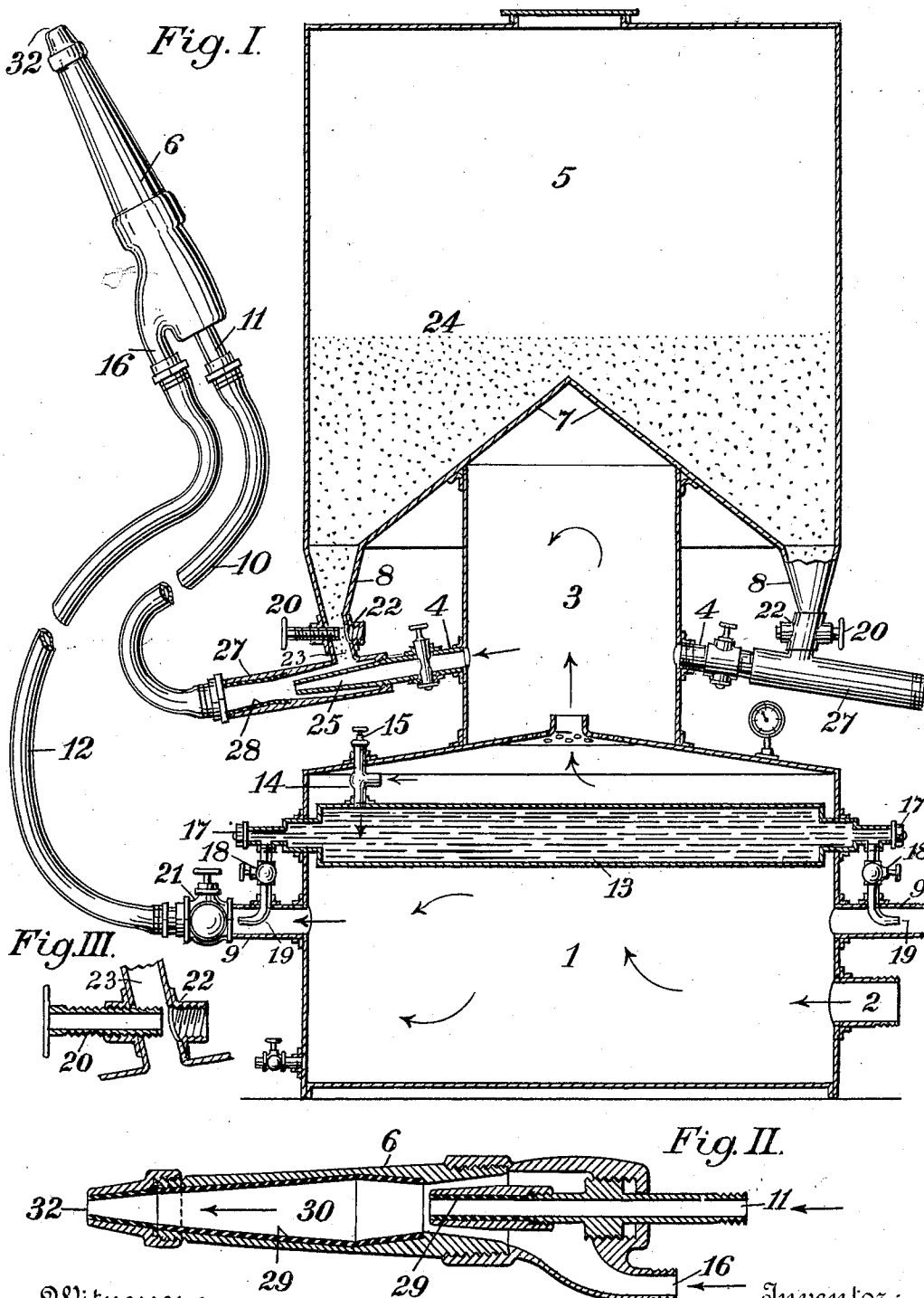


No. 783,218.

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J. D. MURRAY.
SAND BLAST APPARATUS.
APPLICATION FILED MAY 12, 1904.



Witnesses:
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By

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UNITED STATES PATENT OFFICE.

JOHN D. MURRAY, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO INTERNATIONAL SAND BLAST COMPANY, A CORPORATION OF CALIFORNIA.

SAND-BLAST APPARATUS.

SPECIFICATION forming part of Letters Patent No. 783,218, dated February 21, 1905.

Application filed May 12, 1904. Serial No. 207,705.

To all whom it may concern:

Be it known that I, JOHN D. MURRAY, a citizen of the United States of America, 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 applications of the sand-blast and improvements therein.

My improvement consists in driving the sand or abrading material by means of air and water, the latter entrained by the air as it passes through the distributing-pipe, preferably at some point near the receiver, from where the air is supplied under pressure, and also consists in devices to regulate the pressure on and the water admitted to the air-conducting pipe and other accessories, as shown in the drawings herewith and forming a part of this specification.

The object of my improvement is to avoid dust caused by the application of sand-blast in confined places, as in the holds of ships, to keep the sand comparatively dry until its impingement and to intensify the effect on obdurate oxidized surfaces by the greater weight of the sand and water combined. To this end I construct sand-blast apparatus as illustrated by the accompanying drawings, that form a part of this specification.

Figure I is a vertical section through a sand-blast apparatus embodying my improvements; Fig. II, an enlarged longitudinal section through a nozzle for applying the sand, and Fig. III an enlarged section through a throttling-valve such as is employed to regulate the quantity of sand employed.

In the application for abrading purposes by a blast of air the effect produced, especially on oxidized metallic surfaces, is greatest when the sand is dry; but the dust produced by the operation, especially in the holds of ships and other confined places, is disagreeable to work-

men, also is injurious to health by reason of the flying particles inhaled. Steam or saturated air as a means of conveying and applying the sand prevents dust, but at the same time diminishes the abrading effect of the sand. It is, however, discovered that water introduced in the air-conducting pipe is carried forward by entrainment in the form of globules and is not atomized until it impinges on the surfaces being abraded or treated. Consequently the effect of the sand remains nearly the same as when used dry, but the dust that would otherwise rise from the surfaces is saturated with the atomized water and prevented. This is the object of my invention, carried out by means now to be described.

Referring to the drawings, 1 is a receiver filled with air under pressure supplied through a pipe 2; 3, an extension of the receiver 1, forming a dry chamber for the air coming from receiver 1, which is often loaded with moisture of condensation, also forms a convenient structure to which one or more sand-ejecting nozzles 4 can be attached.

5 is a superposed sand-tank provided with a conical bottom 7 and several conveying outlets 8, corresponding to the number of sand-ejecting nozzles 4 that are to be employed (commonly two or more) in operating on marine vessels, a purpose to which my improved apparatus is especially adapted.

The nozzles 4 and 9 are adapted to receive the conducting pipes or hose 10 and 12, that connect, respectively, to the main nozzle 6 and lead from dry chamber 3, sand-tank 5, and the air-receiver 1.

13 is a water-tank preferably placed within the air-receiver 1 and subjected to pressure by means of a communicating pipe 14, provided with a stop-valve 15, that can be employed to regulate the pressure. The tank is filled through the nozzles 17 from some source under pressure, as in the case of city service or by a force-pump. Water from the tank 13 passes through a valve 18 and nozzle 19 into the air-current, escaping through the valve 21, and is entrained thereby and carried through the hose or pipe 12 to the main nozzle 6 in the

form of spray or globules without saturating the air to an extent that wets the sand before its discharge from the nozzle 6 and impingement on the surface being abraded or cleaned.

5 The quantity of sand admitted to the hose or pipe 10 is regulated by the screw-valve 20, (shown enlarged in Fig. III,) that when screwed inward into the seat 22 closes the passage 23. The sand is blown by the blast-nozzles 25
10 through the chamber 27 into the pipe or hose 10, the former having an elastic lining 28 to prevent abrasion by the sand. A similar lining 29 is placed in the main nozzle 6, as shown in Fig. II, as described and claimed in my co-
15 pending application, Serial No. 179,080, for improvements in sand-blast apparatus. The air, water, and sand entering the main nozzle 6 through the nipples 11 and 16 meet at high velocity in the chamber 30 of the main nozzle
20 6, are driven out at 32, and directed against the surfaces to be treated where the entrained water by concussion and in some degree by the heat of impact is atomized and mingles with

the dust, preventing that from rising and floating in the air.

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

In sand-blast apparatus, a receiver containing air under pressure, a chamber containing
30 sand or other abrading substance, flexible pipes or hose connecting from these vessels to an ejecting-nozzle, means to regulate the quantities of air and sand respectively, a water-inlet and means to supply water to the air-conduct-
35 ing pipe or hose and means to regulate the amount of water supplied thereto, combined and operating substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two sub-
40 scribing witnesses.

JOHN D. MURRAY.

Witnesses:

JNO. A. MAGEE,
HENRY P. DIMOND.