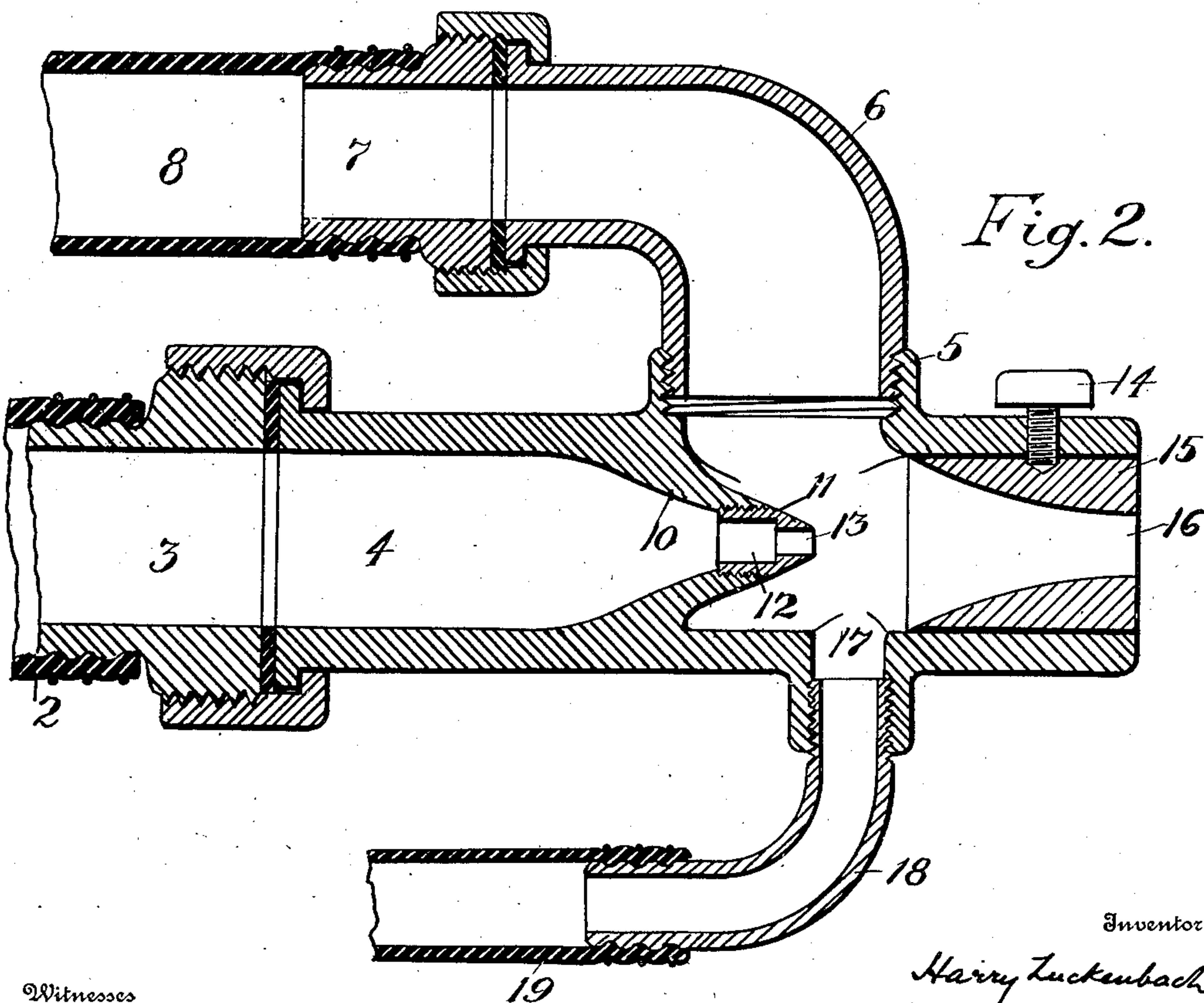
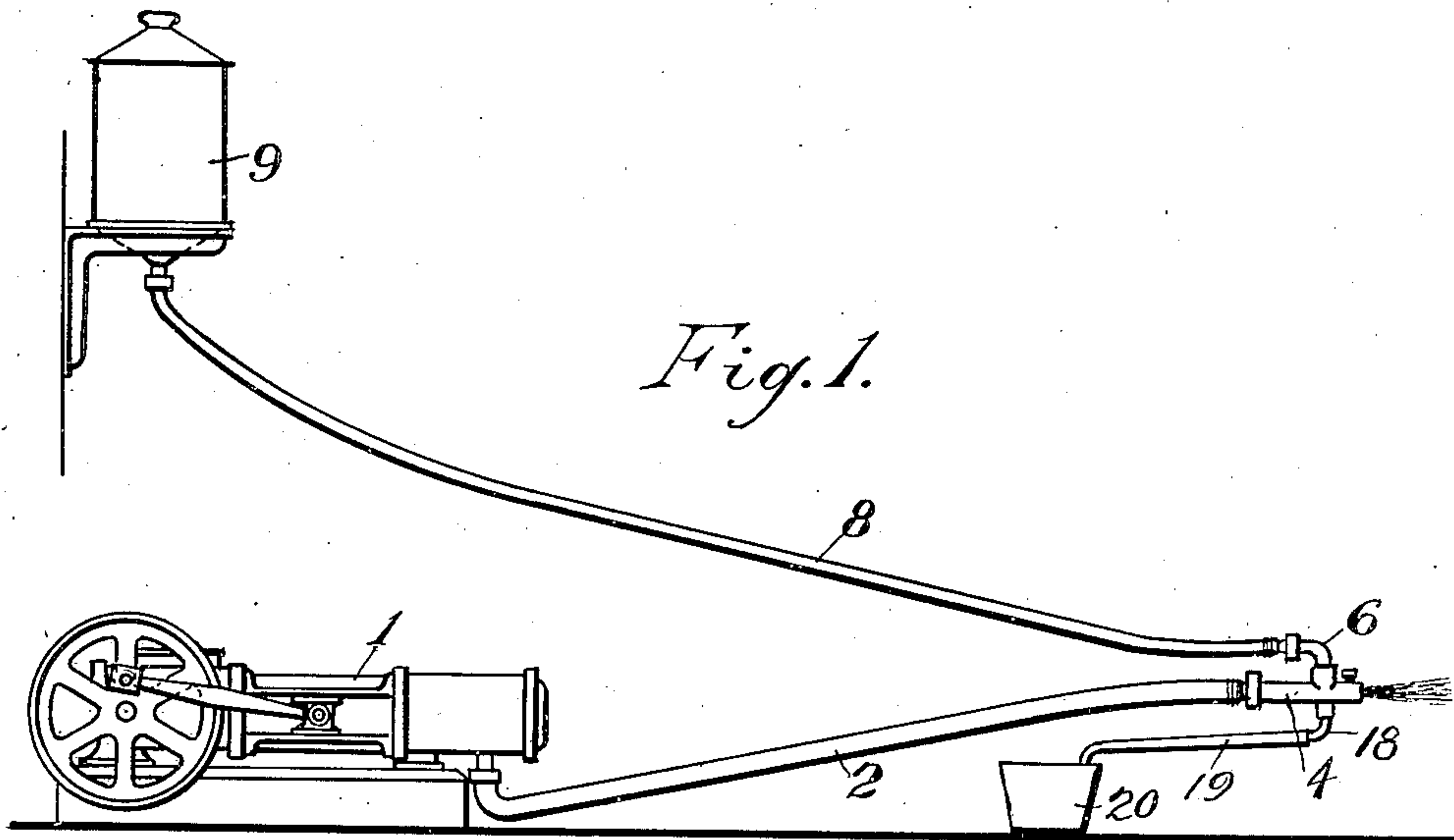


No. 822,379.

PATENTED JUNE 5, 1906.

H. LUCKENBACH.  
SAND BLAST APPARATUS.  
APPLICATION FILED JUNE 13, 1905.



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# UNITED STATES PATENT OFFICE.

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## SAND-BLAST APPARATUS.

No. 822,379.

Specification of Letters Patent.

Patented June 5, 1906.

Application filed June 13, 1905. Serial No. 264,991.

*To all whom it may concern:*

Be it known that I, HARRY LUCKENBACH, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Sand-Blast Apparatus, of which the following is a specification.

This invention relates to an improved sand-blast apparatus, the object of the invention being to provide an apparatus for cleaning buildings or removing iron-rust, paint, or the like which shall be cheap and simple in construction and convenient and effective in operation.

In the accompanying drawings, Figure 1 is a side elevation of the apparatus as a whole. Fig. 2 is a longitudinal section of the nozzle.

Referring to the drawings, 1 represents an air-compressor delivering compressed air by a flexible tube 2 to a coupling 3, connected to the rear end of a nozzle 4. Connected with a lateral opening 5 in said nozzle is an elbow 6, connected by a coupling 7 with a flexible tube 8, leading from a box 9 for containing sand. Said nozzle 4 is formed with a conical seat or spout 10, into which is screwed a tip 11, the form of which is of importance for the successful operation of the invention. The opening therethrough includes a cylindrical rear aperture 12 of uniform diameter leading to a cylindrical front aperture 13, also of uniform diameter, but less than that of the aperture 12. The end of the aperture 12 next to the aperture 13 is square to said apertures. The length of the aperture 13 is substantially twice its diameter. Compressed air discharging from such an aperture will form a narrow cylindrical jet not spreading to any considerable extent.

On the opposite side of the nozzle to the opening 5 is an opening 17, connected by an elbow 18 with a flexible tube 19, leading from a vessel 20 containing water.

In the mouth of the nozzle is secured by a set-screw 14 a wearing-ring 15, the aperture 16 of which converges from the rear to the front end, but at its narrowest point is much wider than the aperture 13. The compressed air passing centrally through the aperture 16 in a narrow body sucks therewith sand passing down the tube 8. While the sand-box 9

is here shown as at a higher level than the nozzle 4, it has been found in practice that with a sufficient pressure the suction is sufficient to draw the sand upward from a lower level. At the same time water is sucked up through the tube 19, and the sand and water thus drawn into the nozzle are discharged together with the compressed air from the aperture 16 with great force and may be used to clean rusty iron, the sides of buildings, or other material for which a sand-blast apparatus is ordinarily used. The addition of the water serves to render the blast more effective and also keeps down the dust.

The word "air" in the claims is to be understood in the broad sense of any gaseous fluid, such as steam, which is the equivalent thereof for the objects of the apparatus.

I claim—

1. A sand-blast apparatus comprising a nozzle having in its discharge end a removable wearing-ring, and a tip discharging compressed air through said wearing-ring, said tip having a discharge-hole of a length twice its diameter, the surface of the metal adjacent to the rear end of said hole being square to the axis of said hole, a device for providing compressed air, a flexible conduit connecting said device with the rear end of said nozzle, a receptacle for sand, and a flexible pipe connecting said receptacle with the nozzle between the discharge-tip and wearing-ring, substantially as described.

2. In an apparatus of the character described, the combination of a nozzle having a discharge end, the inner surface of which converges to the end thereof, and having a tip for discharging compressed air through said discharge end, the length of the discharge-aperture of said tip being substantially twice its diameter and the surface thereof immediately at the rear of said aperture being square to said aperture, means for furnishing compressed air, a flexible pipe connecting said means with the rear end of said nozzle, a receptacle for sand, and a flexible pipe connecting said receptacle with the nozzle between the tip and the discharge end of the nozzle, substantially as described.

3. In an apparatus of the character described, the combination of a nozzle having a discharge end, and having a tip for discharg-

ing compressed air through said discharge  
end, means for furnishing compressed air, a  
flexible pipe connecting said means with the  
rear end of said nozzle, a receptacle for sand,  
5 a receptacle for water, and flexible pipes con-  
necting said receptacles with the nozzle be-  
tween the tip and the discharge end of the  
nozzle, substantially as described.

In witness whereof I have hereunto set my  
hand in the presence of two subscribing wit- 10  
nesses.

HARRY LUCKENBACH.

Witnesses:

FRANCIS M. WRIGHT,  
BESSIE GORFINKEL.