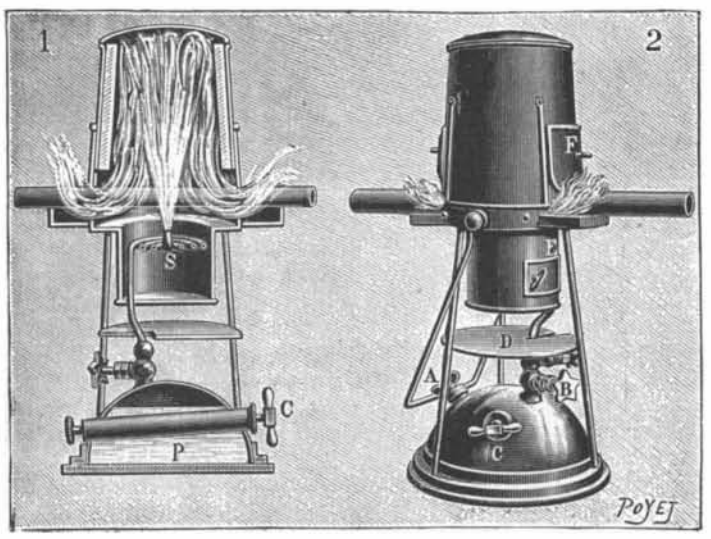
PORTABLE PETROLEUM STOVE.

Plumbers, gasfitters and roofers have constant need of a portable stove for the various operations that they have to perform, such as bending iron pipes, melting metals, brazing, tempering tools, heating soldering irons, etc.

Coke or charcoal stoves sufficiently powerful present various inconveniences. It takes time to get them ready for use, and an unnecessary amount of fuel has to be consumed to keep them going.

The portable stove that we represent in the accompanying engraving is both powerful and economical. It is always ready for operation, necessitates no expense when not in actual use, and is widely employed in places where petroleum is cheap.

The apparatus consists of a copper reservoir, P, containing the petroleum, and traversed by a pump, C, which serves to establish a pressure of air at the surface of the liquid. Above the reservoir and separated therefrom by a horizontal disk, D, forming a screen to prevent the heating of the reservoir, is placed the stove properly so called. It is in the latter that all the petroleum is burned after being vaporized by its passage through a worm, S, heated by the flame. This worm is formed of an iron tube starting from the bottom of the reservoir and ending in a central jet at the other extremity. Upon the ascending tube is placed a cock, B, for regulating the discharge of the petroleum, and, consequently, the intensity of the flame. Beneath the worm there is an iron cup which is opened at E, and into which, for lighting, is poured a spoonful of amylic alcohol, after care has been taken to fill the reservoir, P, with petroleum after unscrewing the plug, A. The alcohol is lighted, and as soon as the worm is hot the cock is opened, the jet takes fire and the apparatus is ready for use. Upon the stove there may be placed either a cast iron pot in which to melt lead or tin, or the tools that it is desired to heat or temper, or the iron tubes to be bent, etc. The apparatus renders the same services as a small portable forge. —La Nature.



1. Section. 2. General View.

PORTABLE PETROLEUM STOVE.

USE OF THE SAND BLAST FOR CLEANING STRUCTURAL IRONWORK.

The massive steel viaduct which carries One Hundred and Fifty-fifth Street across the terminal station of the Manhattan Elevated Railway has suffered very serious corrosion, as the result of the gases which are continually playing upon it from the locomotives of the road. In addition to the coat of paint given to the ironwork at the shops, it has been painted four times, or once a year since its erection; yet so active has this agent been in scaling off the paint and assisting in the corrosion of the metal, that the Board of Public Works has been obliged to take special measures to protect the structure. It has been decided to first thoroughly clean the steelwork by the sand blast and then paint it with eighteen different varieties of paint. As time goes on, a careful record will be made of the behavior of each variety of paint, and in this way it is hoped to secure a coating that will protect the surface for a reasonable length of time.

It was found that the common wire brush would not give that perfectly clean surface which was necessary for the best results. It was necessary to get rid, not merely of the old paint, but also of rust and scale, and the consulting engineer of the board decided this result could only be secured by the use of the sand blast. The work is being done by Ward & Nash, of Boston, Mass., under the supervision of Mr. M. E. Evans, of the Board of Public Works.

The air is compressed by two Ingersoll-Sergeant machines, which deliver to a receiver which has a capacity of 30 cubic feet. From this it is led to a second receiver, which, together with the mixers, is placed on the staging which has been built beneath the trusses. The mixer is a vertical iron cylinder 30 inches in diameter and about 5 feet high. In the upper half are located two hoppers which are riveted in place one above the other, as shown in the engraving. Each hopper is furnished with a closing valve and a valve stem, the stem of the lower valve passing through the upper stem, which is hollow. Below these is a third hopper of less diameter than the cylinder. It delivers into a three-inch pipe in which is a sliding plate provided with a narrow slit which, by means of a rod and a lever outside the mixer, can be enlarged or reduced to vary the stream of sand which is to be blown into the hose pipe.

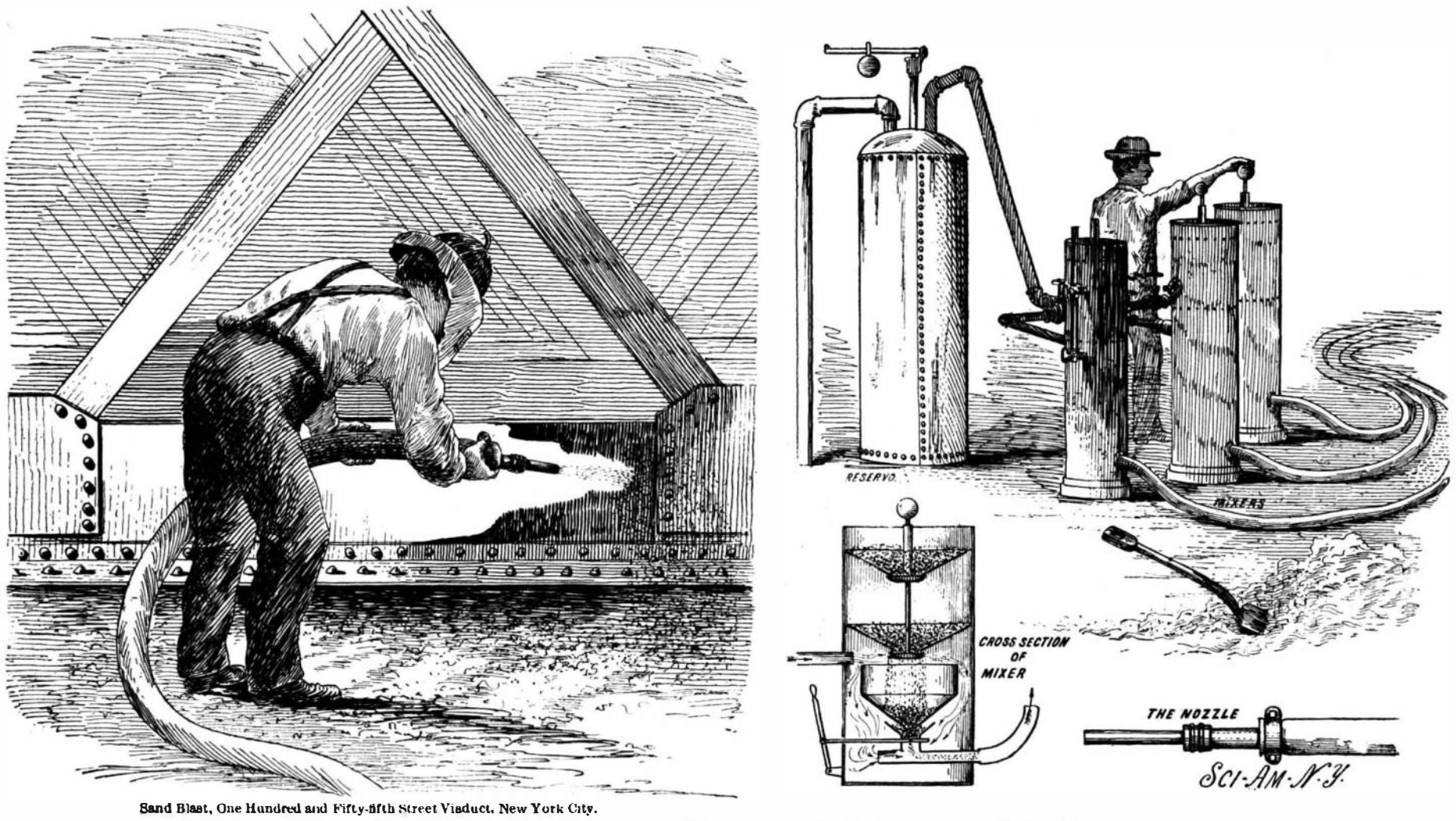
The two upper hoppers being airtight, it will be seen that the mixer is divided into two airtight spaces. The compressed air is admitted to the lower space by the pipe shown in the engraving and leaves by the pipe seen on the opposite side of the mixer. The mixing is done as follows: The sand (in this case a clean and rather coarse silicious sand, obtained on Long Island Sound) is fed into the top hopper. The lower valve is closed and the upper one opened and the sand passes into the second hopper. The upper valve is now closed and the heavy ball which is attached at the top of the stem of the lower valve is then given a slight blow which serves to force the lower valve open against the air pressure and allows the sand to fall to the third hopper. The action of the above device, it will be seen, is similar to that of the common air lock.

By reference to the engraving it will be seen that the air (which enters the mixer carrying 20 pounds pressure to the square inch) can circulate freely round the lowest hopper and that it finally escapes through the outlet pipe into which the sand is falling in a thin sheet. Here it picks up the sand, carrying it through the hose pipe to the nozzle. The mixing is very complete and remarkably even. The 2½ inch hose is of a special make, being lined with rubber to resist the cutting action of the sand. The nozzle is 8 inches in length with a $\frac{9}{16}$ inch opening, and is made of chilled iron, with a view to resisting the abrasion of the sand, which is so severe as to necessitate frequent renewals of this part. The air would leave the nozzle at a speed of over 1,100 feet a second if it were unencumbered with the sand. The speed of the mixture of sand and air is about 300 feet per second.

The man who handles the nozzle is protected by a helmet with gauze eye pieces. The nozzle is held a few inches from the ironwork, and, as the particles of sand strike the surface, they break up and cut away all the scale, rust and old paint, leaving a perfectly clean metal surface exposed. The blast is so searching that all the interior surface of pitholes is cleaned out. Herein lies one of the great advantages of the blast over the steel wire brush, when intricate structural work is being cleaned, as the sand will reach interior surfaces which the steel brush will not touch. It is estimated that it takes about one-third of a cubic foot of sand to clean each square foot of surface on this structure. At the commencement of the work it cost about 20 cents per square foot to do the cleaning, and at the time we inspected the work the cost was reduced to 10 cents per foot. It is estimated by Mr. Evans that, for large surfaces like this, the plant, erection of scaffolding and the cleaning would cost at the rate of 7½ cents per foot.

The surface of the metal is so perfectly cleaned that it is extremely sensitive to the action of the weather, and in a few hours after cleaning, if the atmosphere is humid, the grayish white color will have changed to dull red, as the result of oxidation. Consequently the cleaning and the painting are carried out in one day, the cleaning going on from 6 A. M. to 3 P. M. and the first painting being done from 3 P. M. to 6 P. M. of the same day. The paints which have already been applied adhere to the metal much more firmly than that which was put on over old paint.

We are indebted to Mr. M. E. Evans, of the Board of Public Works, for particulars of this interesting work.



Sand Blast, One Hundred and Fifty-fifth Street Viaduct, New York City.

USE OF THE SAND BLAST FOR CLEANING STRUCTURAL IRONWORK.