

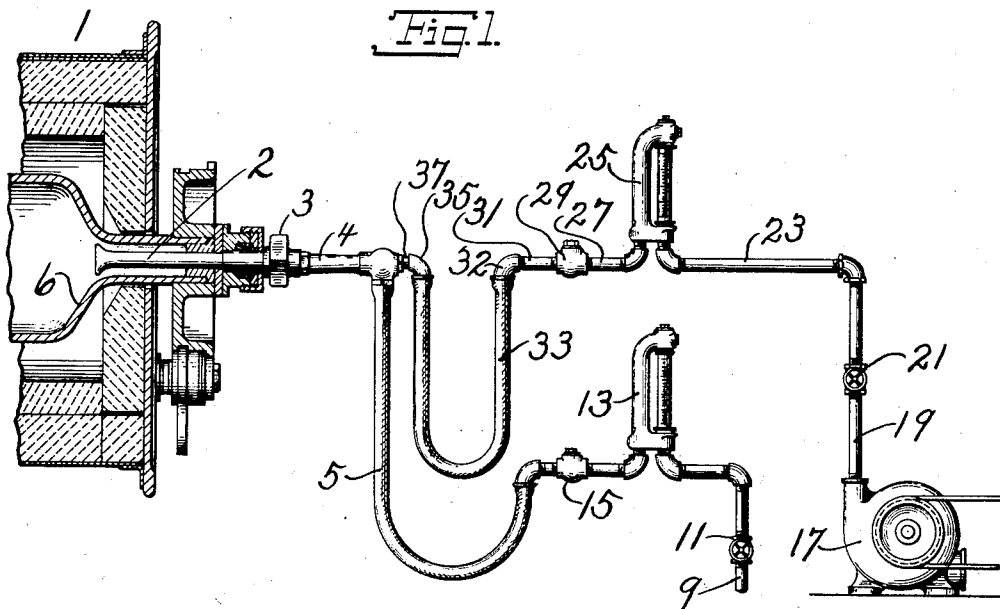
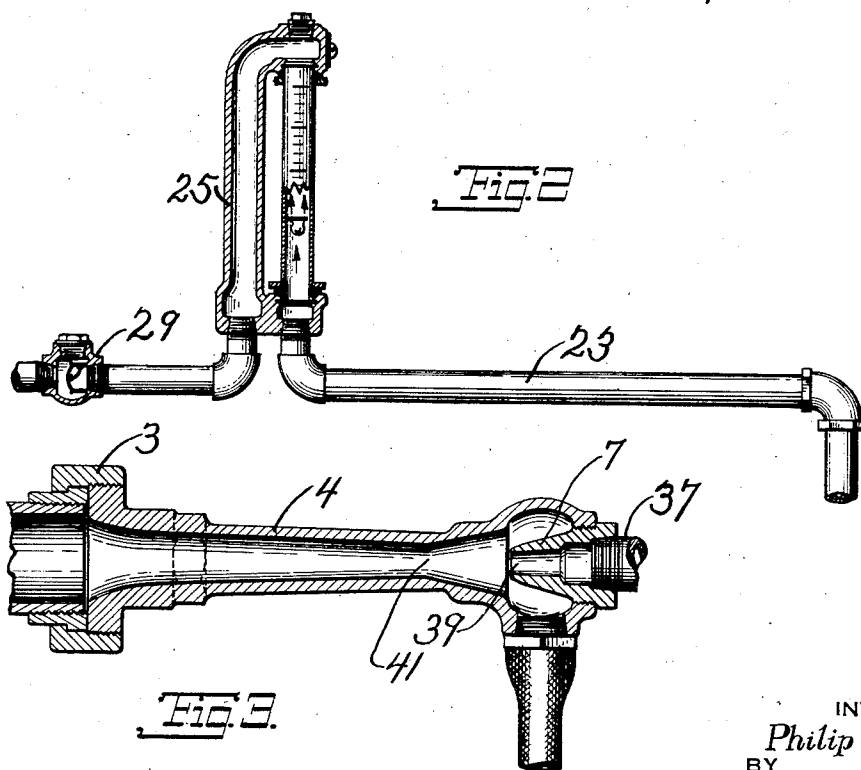
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INJECTOR APPARATUS FOR CASE HARDENING RETORTS

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INJECTOR APPARATUS FOR CASE
HARDENING RETORTS

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1 Claim. (Cl. 266—5)

This invention is an improvement upon my invention described in my United States patent application for Carburizing apparatus and method, Serial No. 473,179, filed August 5, 1930.

My invention pertains particularly to the method of using available instrumentalities in an improved arrangement, to accurately proportion the quantities of carburizing gas and air or other diluents which are to be introduced into the retort of a case hardening or carburizing furnace for the purpose of effecting the carburizing of the work contained therein.

A broad object of my invention is to provide an improved apparatus and an improved method of using same, capable of highly efficient and accurate control of the proportions and the mixture of the gas and diluent and to accomplish this efficiently with apparatus of low first cost and inexpensive in operation.

Another object of my invention is to provide an improved apparatus and method for this work, which is particularly designed to operate effectively in conjunction with gas under very slight pressure, of the order of a fraction of an ounce per square inch, and air under low pressure, such as can conveniently be created by a conventional blower fan or the like.

Another object is to provide a special form of Venturi injector for such apparatus wherein the cross section of the jet nozzle opening is large in comparison with conventional injectors, the jet nozzle opening being preferably half the diameter or more than half the diameter of the throat of the Venturi tube.

Another object is to provide an improved arrangement of flexible hose for both the gas and air whereby the mixture of gas and air may be created in as close proximity as possible to the mouth of the retort.

Other objects will appear from the detailed description of a preferred construction which follows, and be pointed out in the appended claim.

Referring to the accompanying drawing:—

Fig. 1 is a side elevation partly in section of a typical apparatus in which my method may be practiced.

Fig. 2 is an enlarged fragment of the apparatus of Fig. 1, showing one of the flow meters partly in section; and,

Fig. 3 is an enlarged view of the injector from which the proportions of this part of the apparatus may be readily understood.

The numeral 1 indicates a fragment of the right hand end of a conventional rotary case hardening or carburizing furnace provided with a gas inlet pipe 2 and a union 3 at the right hand end of pipe 2.

In the indicated position, union 3 attaches a Venturi injector tube 4 to pipe 2. At the right hand end of tube 4 a depending flexible hose 5 is shown, and gas may be drawn into the retort 6 of furnace 1 by the injector which comprises tube 4 and a nozzle 7, best shown in Fig. 3.

A source of gas is indicated as flowing from a service main 9, through a valve 11, a flow meter 13, a check valve 15, and into the hose 5 previously mentioned.

Referring to the right of Fig. 1, a blower 17 is indicated as forcing air through a pipe 19, a valve 21, a pipe 23, a flow meter 25, a pipe 27, a check valve 29, a pipe 31, an elbow 32, a depending flexible hose 33, an elbow 35, and a nipple 37, into the nozzle 7.

It may be observed that the blower 17 is of a conventional centrifugal type, capable of creating only a small air pressure, usually less than a half pound per square inch. This type of blower is inexpensive in first cost and is trouble free in operation as compared with blowers designed to create higher pressures.

However, such low pressures will not entrain gas successfully without a special nozzle, such as nozzle 7, being provided. Nozzle 7 has an orifice 39, which has a bore not less than half the diameter of the bore of the throat 41 of tube 4.

I claim:—

The combination in an injector apparatus for introducing treating gas into heat treating retorts, of a source of gas, insufficient in pressure to effectively mix with a diluent, such as air, and inject the mixture into the retort, of a compressor for the diluent, a Venturi injector provided with an injector nozzle connected to the compressor, said injector also being connected to the gas source whereby the gas may be entrained and mixed with the diluent in suitable proportions and injected into a retort, means to regulate the quantity of the mix and meter means connected to both the gas and the diluent whereby the character and quantity of the mix may be at all times observed as it flows.

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