

W. I. TWOMBLY.  
HYDROCARBON GAS GENERATOR.  
APPLICATION FILED MAR. 26, 1904.

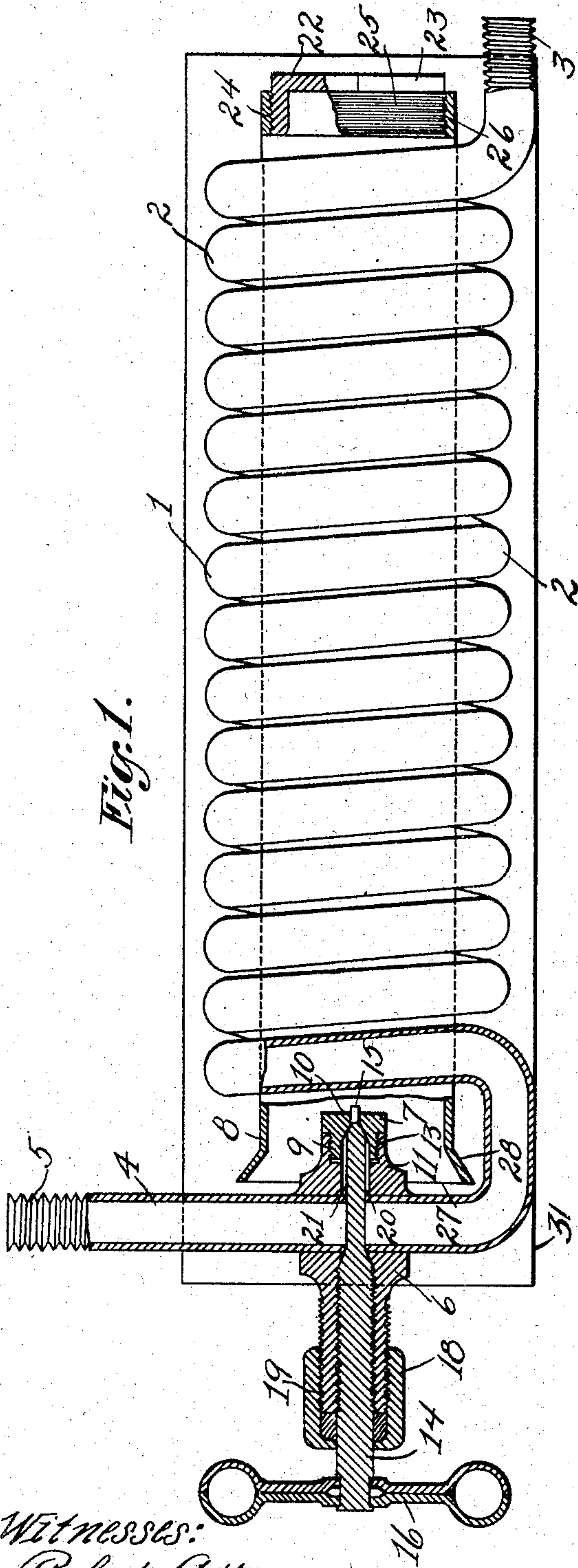


Fig. 1.

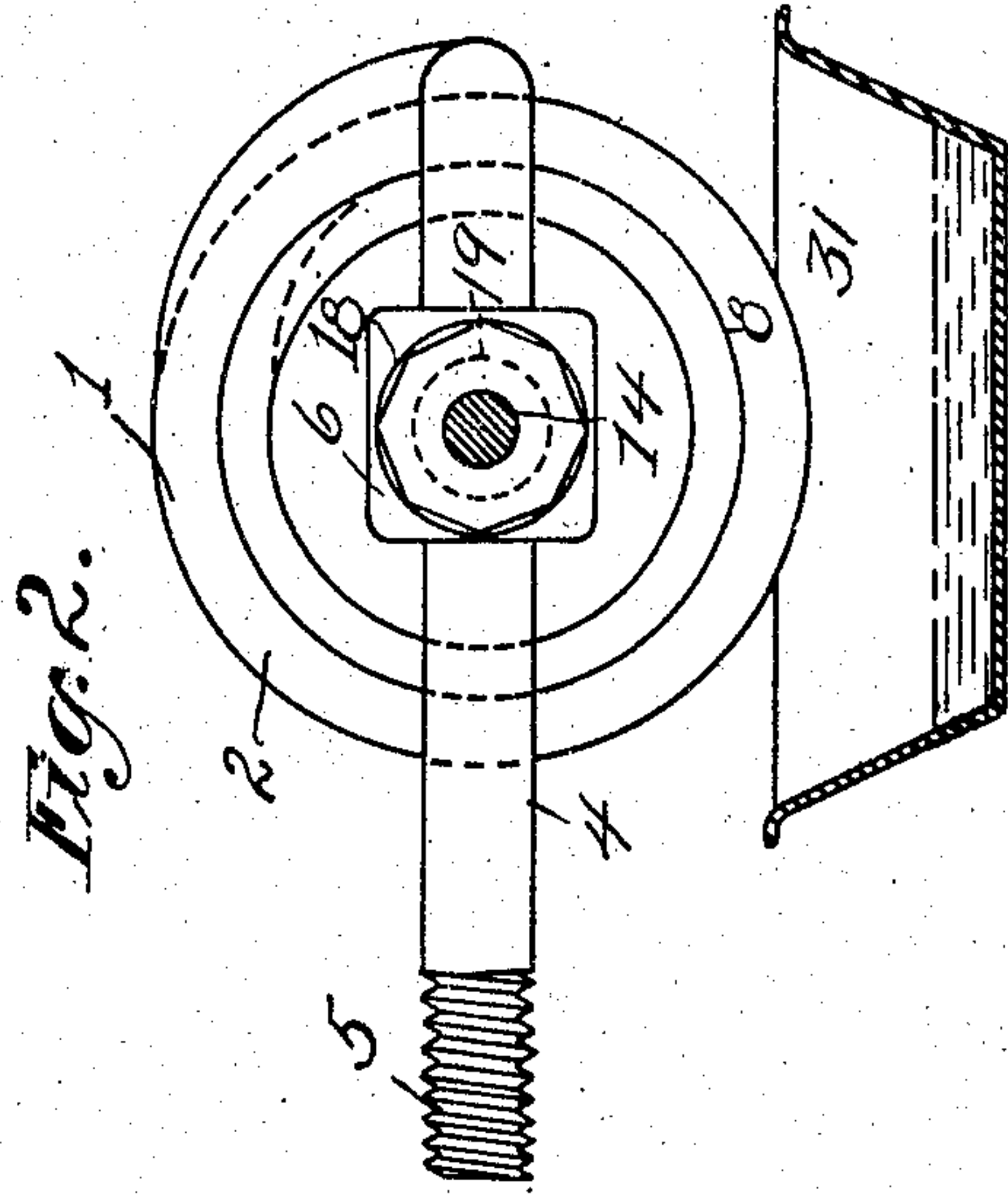


Fig. 2.

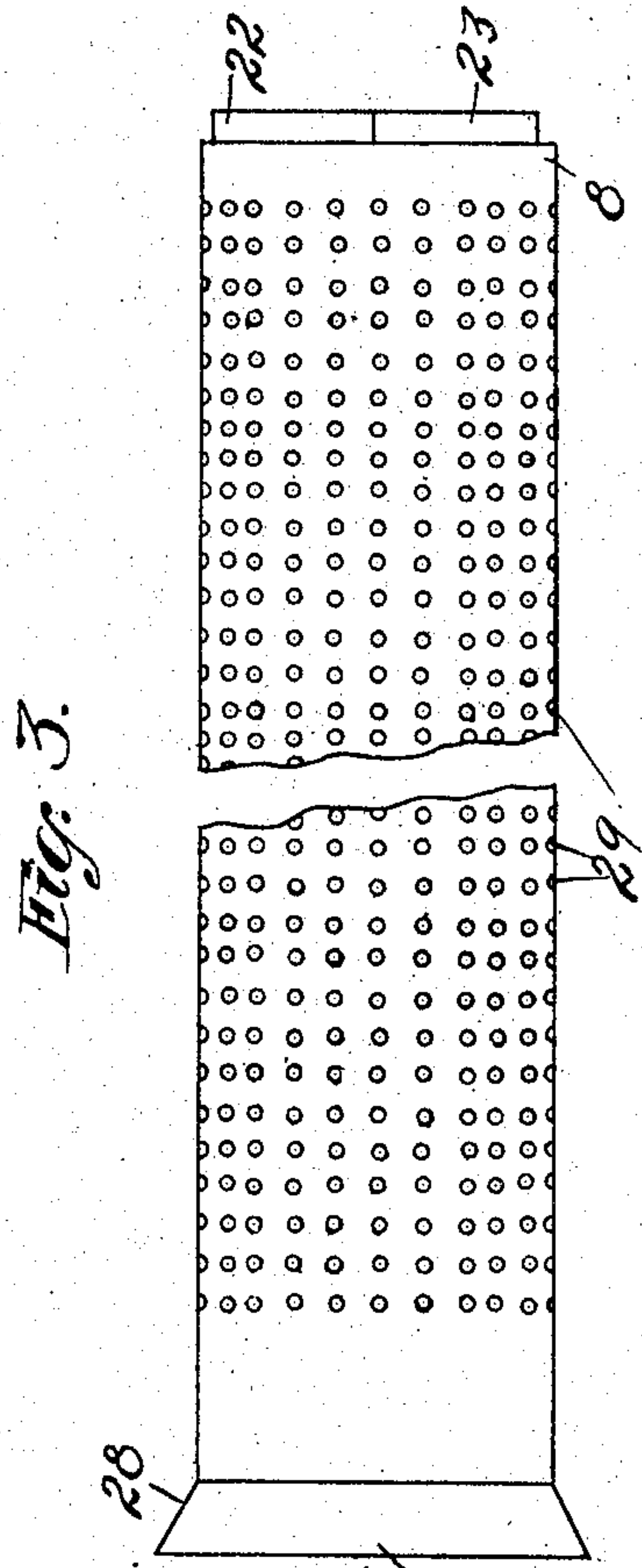


Fig. 3.

Witnesses:

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# UNITED STATES PATENT OFFICE.

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## HYDROCARBON-GAS GENERATOR.

No. 796,166

Specification of Letters Patent.

Patented Aug. 1, 1905.

Application filed March 26, 1904. Serial No. 200,131.

*To all whom it may concern:*

Be it known that I, WILLARD IRVING TWOMBLY, a citizen of the United States, residing in Manhattan borough, New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Hydrocarbon-Gas Generators, of which the following is a specification.

This invention has reference to means for generating hydrocarbonaceous substances into gas.

It is an object of the invention to effect such generation through the instrumentality of an inexpensive, simple, and durable structure, while at the same time to obtain a maximum efficiency.

The drawings forming a part of this specification disclose an embodiment of the invention, Figure 1 thereon illustrating in elevation a complete generating device, partly broken away and partly in section to show construction. Fig. 2 is an end elevation, partly in section, while Fig. 3 is a top plan view of the perforated drum.

Like characters of reference indicate corresponding parts in all of the figures.

In the form disclosed in the drawings, and which may perhaps be the most preferred form, the structure is defined by a length of piping 1, convoluted into coils 2, which produces a generating member. One end of the piping 1 is screw-threaded, as at 3, so that it may be suitably connected to the source of supply (not shown) containing the hydrocarbonaceous substance to be generated into gas. The other end 4 of the piping is so bent or formed as to preferably occupy a position some distance away from the body of the coils, and this end extends, preferably, in a plane parallel with the convolutions of the generating-coil and is likewise provided with a screw-threaded portion 5, so that the same may be suitably connected with a gas-consuming apparatus. (Not shown.) That portion of the piping 1 which is designated by 4 is provided with a valve generally designated as 6 and which is preferably brazed upon said portion 4 and is preferably so located that the discharge-nozzle 7 of said valve may be directed into a suitable drum 8, which occupies the annular space formed by the convolutions 2. In its preferred form this valve may be of the ordinary "needle-valve" type having a mouthpiece 9, provided with a minute opening 10, and which is preferably detachable from the body 11 of the valve by

being screw-threaded thereinto, as at 13. The stem 14 of said valve is also provided with a needle-point 15, which occupies the opening 10 when the valve is closed, and said stem is provided with the usual handle 16 for manipulating the same, and, as is obvious, said valve is provided with the usual packing-cap 18 to maintain suitable packing 19 in place for the purpose of preventing leakage. It will be understood, of course, that the valve-stem passes through openings 20 and 21 in the pipe 4. The drum or cylinder 8, which occupies the internal space formed by the plurality of convolutions 2, is in the present instance preferably an elongated member which is preferably closed at one end by some suitable means, such as a plug 22, having a squared portion 23, so as to permit it to be readily attached or removed from the cylinder portion 24 of the drum, preferably by screw-threads 25 on said plug and corresponding screw-threads 26 on the interior of said drum. The opposite end of said drum is open, as at 27, and is preferably flared or bell-shaped, as at 28, and this drum takes over the nozzle of the valve 6, as seen, for instance, in Fig. 1. This drum is in the present instance also provided with a multitude of perforations 29, as seen in Fig. 2, and this drum is preferably of such a size as to be maintained within the opening formed by the coils in any relative position to the valve by contacting frictionally with the inner face of the coil, so that, if desired, the drum may be shifted toward or away from the valve at will. Such a structure produces a gas-generating device—that is to say, the fuel which passes into the coils 2 is generated into gas—and some of that gas is utilized for feeding the heating-drum within the coils and which intensely heats the latter to generate into gas the fuel which is passing thereinto, and this result is preferably accomplished in the following manner: For the purpose of heating the coils 2 in the first instance I provide a suitable receptacle 31, which may contain sufficient burning fluid when ignited to heat the coils sufficiently to produce generation into gas of the fuel coming through that portion of the coil which is connected to the supply. When this is accomplished, the valve 6 may be opened, whereupon the gas may be ignited through the perforations 29 of the drum 8, which continues the heating of the coils 2, and likewise is the generation of gas also continued, and in this way a supply of gas from such substances as kerosene, petro-



leum, or the like is constantly generated for use by a suitable apparatus, which may be attached to the piping at 5.

It will now be seen that in this simple and efficient structure I provide for the generation of hydrocarbonaceous substances into gas by a heating means which consumes a portion of the gas being generated, and therefore I do not have to depend upon a secondary supply of fuel for heating the generator, which is a desideratum. It will be further observed that the parts may be readily dismantled—that is, the coil may be removed from the heating-drum, and vice versa—in case any of the parts become impaired by usage, and it will also be observed that said drum is so frictionally fitted into the coil that it may be shifted to occupy different relative positions to the burner-valve in order to obtain the proper admixture of air into gas. It must also be observed that I do not confine myself to the precise construction herein shown and described, as this principle may be embodied in any suitable form adapted to practical purposes without departure from the spirit of this invention. It will be further noted that the perforations in this drum will in practice be very small and that the flame emanating therefrom will semi-envelop the various convolutions of the coil and that the flame will not “fire back” into the mixing-tube.

It may be mentioned that if desired in practice the heating-drum may be entirely omitted and that the flame may impinge the convolutions direct; but by the use of such a drum—for instance, as shown—the apparatus in operation is practically noiseless, inasmuch as after the flame has emanated from the

minute perforations in the drum it cannot fire back into the drum, which in practice has been found to be the direct cause of the great roaring in apparatus of this character.

It will be observed from the drawings that the convolutions of the coil should be separated from each other for a distance of from one-sixteenth to one-eighth of an inch in order to get a proper combustible mixture of gas and air.

Having thus described my invention, I claim—

1. A gas-generator comprising a length of piping coiled upon itself to form a generator, a heating-drum for said coils located in the openings formed thereby and which tightly fits therein, closed at its outer end and perforated throughout its entire length, said coil having a delivery-pipe leading therefrom, and means communicating with said delivery-pipe for directing a part of the generated gas into the heated drum.

2. A gas-generator comprising a length of piping coiled upon itself to form a generator, a heating-drum for said coils located in the openings formed thereby and which tightly fits therein, closed at its outer end and perforated throughout its entire length, said coil having a delivery-pipe leading therefrom, and a valve communicating with said delivery-pipe for directing a part of the generated gas into the heating-drum.

Signed at Nos. 9 to 15 Murray street, New York, N. Y., this 24th day of March, 1904.

WILLARD IRVING TWOMBLY.

Witnesses:

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