

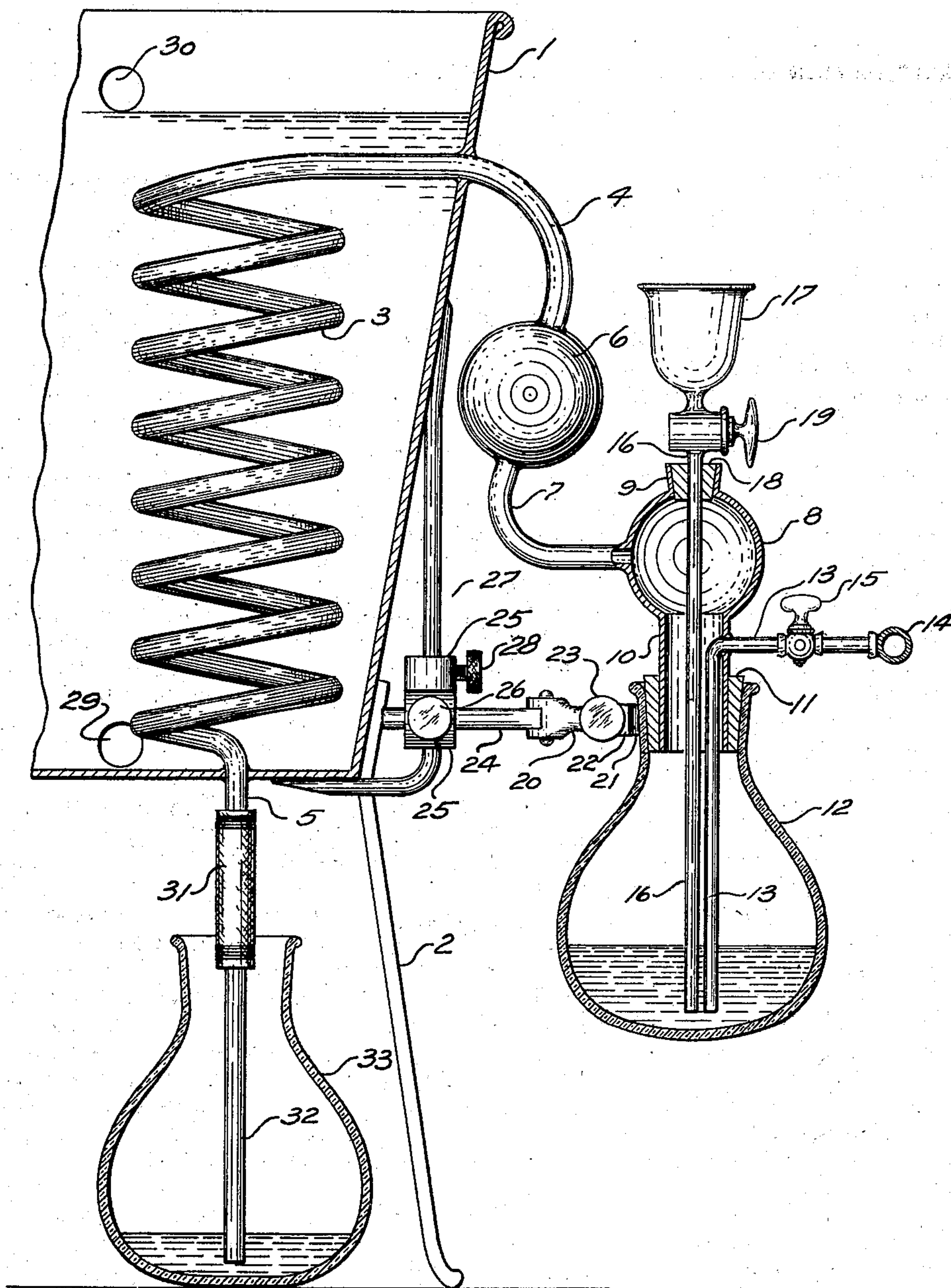
No. 700,268.

Patented May 20, 1902.

J. A. WESENER.  
CHEMICAL APPARATUS.

(Application filed Oct. 28, 1901.)

(No Model.)



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

JOHN A. WESENER, OF CHICAGO, ILLINOIS.

## CHEMICAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 700,268, dated May 20, 1902.

Application filed October 28, 1901. Serial No. 80,239. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN A. WESENER, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Chemical Apparatus, of which the following is a specification.

My invention has been applied particularly to distilling apparatus suitable for estimating the quantity of nitrogen in making a chemical analysis.

The main object of my invention is to provide a simple and durable distilling apparatus which can be conveniently handled and which is of suitable structure to facilitate the estimation of the nitrogen, both by saving time in the process of distillation and by avoiding a loss of materials. I accomplish this object by the device shown in the accompanying drawing, in which the figure is a vertical section, partly broken away, of a device constructed according to my invention.

In the device shown the tank 1 is supported on standards 2 and contains the coil 3, which connects with the pipe 4 at its upper end and with the discharge-pipe 5 at its lower end. Said tank and coil together form a condenser. The chamber 6 and pipe 7 form an extension of the pipe 4. At the outer end of the pipe 7 is a chamber 8, having an upwardly-extending neck 9 and a depending tubular extension 10. A sleeve 11, made of resilient material, such as rubber, surrounds the lower end of the extension 10, forming therewith a hollow stopper for the distillation-flask 12. A steam-pipe 13 enters the extension 10 above the sleeve 11 and extends to the bottom of the flask 12. Said steam-pipe connects with a main pipe 14 and is provided with a valve 15. The pipe 14 is connected with a suitable steam-supply, which is not shown in the drawing. The pipe 16 leads from the receptacle 17, through the stopper 18 and extension 16, to the bottom of the flask 12. The valve 19 controls the passage of liquid from the receptacle 17 through the pipe 16.

The pipe 4, chamber 6, pipe 7, and chamber 8 are preferably made of metal and are rigidly connected, so as to support the chamber 8. I prefer this structure to the use of glass bulbs with rubber fittings, since it re-

tains the parts always in proper position and avoids breakage and leakage.

The clamp 20 has the clamp-jaws 21 and 22, arranged to engage the neck of the flask 12 and controlled by the set-screw 23. The clamp-jaw 22 is partly broken away in the figure. The clamp 20 is supported on the rod 24, which is held in the block 25 by means of the set-screw 26. The block 25 is vertically slidable on the rod 27 and held by means of the set-screw 28. The rod 27 is rigidly secured to the tank 1. The clamp 20 will usually remain at a fixed height on the rod 27 and is made adjustable thereon, so that same may be moved when desired to suit the position of the flask on the sleeve 11.

29 represents the mouth of an inlet-pipe through which the tank 1 is supplied with water. 30 represents the mouth of an outlet-pipe which maintains the water at the desired level in said tank. The pipe 5 is connected by means of the flexible section 31 with the pipe 32 in the receiver 33.

The operation of the device shown will be understood from the following description of a method of estimating nitrogen by means of said device: The material containing the nitrogen to be estimated is first digested in the flask 12 by using concentrated sulfuric acid and mercury. After the digestion is completed the flask is allowed to cool, and its contents is then diluted with distilled water. The flask is then connected to the other parts of the apparatus, as shown in the drawing. Sodium hydrate is next added from the receptacle 17 by opening the valve 19. At the same time steam is turned into the flask 12 by opening the valve 15, thus aiding in mixing the alkali with the acid. Potassium sulfid is then added through the receptacle 17 to precipitate the mercury. The steam will then be allowed to continue to flow, the vapors being carried up through the chambers 8 and 6 and into the condenser until all of the nitrogen has been carried into the receiver 33 in the form of ammonia. The chambers 8 and 6 permit the hydrogen sulfid and other materials which are less volatile than the ammonia to cool and return to the flask before passing into the condenser.

It will be understood that some of the de-



tails of the device shown may be altered without departing from the spirit of my invention. I therefore do not confine myself to such details, except as hereinafter limited in the claims.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A chemical apparatus comprising a condenser; a chamber communicating with said condenser and having a tubular extension; a resilient sleeve mounted on said extension and forming therewith a hollow stopper; and a steam-pipe entering said extension above the stopper part, passing out through the interior of the stopper, and having a valve outward of its entering part.

2. A chemical apparatus comprising a condenser; a chamber communicating with said condenser and having a tubular extension; a resilient sleeve mounted on said extension and forming therewith a hollow stopper; a receptacle outside of said extension having a pipe entering said extension above the stopper part, passing out through the interior of the stopper, and having a valve controlling the passage through said pipe; and a steam-pipe entering said extension above the stopper part, passing out through the interior of the stopper, and having a valve outward of its entering part.

3. A chemical apparatus comprising a condenser; a chamber communicating with said condenser and having a tubular extension; a resilient sleeve mounted on said extension and forming therewith a hollow stopper; a steam-pipe entering said extension above the stopper part, passing out through the interior of the stopper, and having a valve outward of its entering part, and an outer clamp adapted to coact with said stopper in engaging and supporting a flask.

4. A chemical apparatus comprising a condenser; a rigid pipe extending downwardly and outwardly from said condenser and rigidly supporting a chamber at its outer end; said chamber having a depending tubular extension provided with a resilient sleeve forming therewith a hollow stopper; a clamp secured to the lower part of said condenser and having jaws acting toward the sides of said

stopper and adapted to coact with said stopper in engaging and supporting a flask; a receptacle outside of said extension having a pipe entering said extension above the stopper part, and passing out through the interior of the stopper, and having a valve controlling the passage through said pipe; and a steam-pipe entering said extension above the stopper part, passing out through the interior of the stopper, and having a valve outward of its entering part.

5. A chemical apparatus comprising a chamber having an outlet-passage in its side, said chamber having a neck extending above same adapted to receive a stopper; a depending tubular extension on said chamber having on its lower end a resilient sleeve forming therewith a stopper; a flask removably fitting the stopper end of said extension; a receptacle above said neck having a pipe passing through said neck and tubular extension to the bottom of the flask and having a valve above said neck controlling the passage through said pipe; a stopper securing said pipe in said neck; and a second pipe, independent of the outlet-passage and independent of the other pipe and said receptacle, entering said extension above the stopper part of same, passing through the interior of said extension to the bottom of the flask, and having a valve outward of its entering part.

6. A chemical apparatus comprising a suitably-supported condensing-tank, a condensing-coil therein having a supply-pipe extending outwardly and downwardly from said tank, the chamber 6, pipe 7 and chamber 8 rigidly connected and supported by said tank in the relative positions shown, said chamber 8 having a depending tubular extension, and a resilient sleeve mounted on said extension and forming therewith a hollow stopper adapted to engage and support a distillation-flask substantially as shown.

Signed at Chicago this 26th day of October, 1901.

JOHN A. WESENER.

Witnesses:

F. W. ROBISON,  
WM. R. RUMMLER.