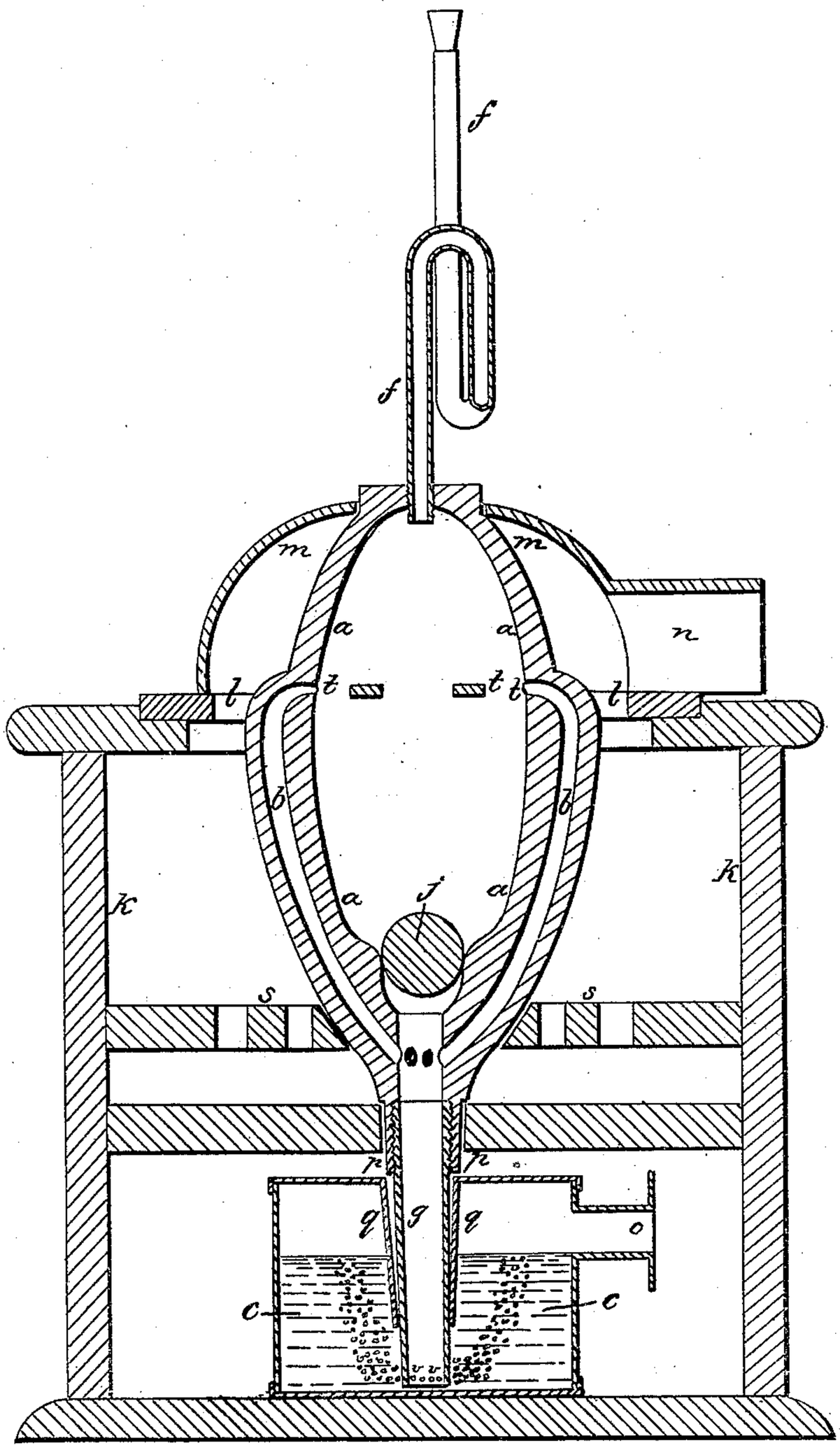
A. B. WILSON.

Gas Apparatus.

No. 21,914. Patented Oct. 26, 1858.



UNITED STATES PATENT OFFICE.

A. B. WILSON, OF WATERBURY, CONNECTICUT.

APPARATUS FOR GENERATING GAS.

Specification of Letters Patent No. 21,914, dated October 26, 1858.

To all whom it may concern:

Be it known that I, ALLEN B. WILSON, of Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful improvements in apparatus for the manufacture of illuminating-gas from oil, grease, or other substances fit for the purpose, which are admitted into a retort in a liquid state, some of which improvements are also applicable in the manufacture of gas from any proper materials; and that the following specification, taken in connection with the drawings, is a full, clear, and exact description thereof.

In the drawing is represented a vertical section through the whole apparatus devised by me.

The object of my invention is to produce a generator or retort to be used in the manufacture of grease or oil gas which shall obviate many of the difficulties now incident, upon the use of such articles.

In carrying out my ideas I have been guided by the desire of producing a maximum quantity of the richest gas from a given quantity of material, and the difficulties that I have chiefly desired to overcome are those arising from the clogging of the retort by lamp-black in charcoal or from the want of proper facilities for cleaning the retort if it should become clogged; and also from the want of easily adjustable joints between the pipe leading from the retort and the condenser or washing cistern.

The apparatus represented in the drawings will serve as an exemplification of the principles of my invention and is the best form and arrangement known to me for carrying them into practice.

The retort of my apparatus may be considered as consisting of two parts in chambers, the one being a still in which the oil or grease is converted into vapor, and the other being a heater or decomposer in which such vapors are converted into permanent gas. This retort is a hollow chamber of iron such as *a a* from which lead passages *b b* communicating at bottom with each other, and then by means of a pipe with a condenser *c c* or they may connect directly with a gasometer. The chamber *a a* is the distilling vessel and the passages constitute the chamber in which the vapors are converted into permanent gas. Into the top of the shell is screwed a bent tube *f f* into the upper open end of which the melted grease, oil, or other liquid furnisher of gas is to be introduced drop by drop; and into the common passage or tube in which the passages all unite is screwed another tube *g* which descends below the level of water contained in the condenser or washer *c c*. It will be observed that the tube in which all the passages unite communicates directly with the bottom of the retort, but when the apparatus is in place for operation this communication is closed by a valve *j*. The retort is to be set within any proper furnace such as *k k* provided with grate, ash-pits, doors, connection with a chimney and other proper accessories, and the retort may be conveniently held in place by a flange such as *l l* attached to the retort itself and resting upon the top of the furnace. I prefer to make this flange of radial arms so that flame and heat can pass through it, and to cover the retort with a dome *m m* having a proper opening for the egress of smoke as at *n*. The condenser *c c* may be located beneath the ash pit as in the drawings or in other convenient place and is provided with an opening *o* to which a pipe leading to the gas holder may be attached, and has around the opening *p* where the pipe from the generator enters, a funnel shaped pipe secured gas tight to the top of the condenser such as *q*.

When gas is to be made all parts are to be substantially in the relative position shown in the drawings. Fire is now to be lighted on the grate *s*, the retort is to be heated up to a proper temperature and drops of gas making material are to be permitted to fall into the mouth of the bent tube. When the bends of the tube are filled, the material will fall drop by drop on to the top of the valve, and thence splash off being disseminated upon the sides of the retort where they will be converted into vapor or partly into vapor and partly into gas; thence rising upward to the orifices *t* they will receive an accession of heat, and entering these orifices they will descend through the passages, receiving a further accession of heat and being all or nearly all converted into permanent gas. After leaving the passages the gas will pass through the tube leading to the condenser and washer, rise up through the water contained therein, be washed by the water and flow out through the aperture *o*.

An attentive consideration of the apparatus will show, that the still will never re-

main at as high or intense a heat as the tubes or passages, first because the latter protect it partially from the fire, second because the exposed surface of the former is less than that of the latter in proportion to its capacity, and thirdly because the still is continually cooled by the splashing of grease against its sides. Two advantages therefore result from such a construction. First the production of a large proportion of gas as the grease is not burned, and second little or no deposit of lamp black or charcoal, which deposit usually arises from contact of grease with a too highly heated surface. It will also appear that when the retort as a whole is lifted and reversed that proper instruments can be introduced, through the descending tube either into the still or the passages, to clean them without breaking any joint or connection (except that between the descending pipe and the condenser) or making any opening; and further that by merely shaking the retort the ball valve, will act as a beater to knock off and break up any deposits. The retort moreover can be cast all in one piece by the use of proper cores for the cavity and passages, and the valve may be cast within it by introducing the valve into the core before it is placed in position in the flask. There remain therefore only two joints and these can be made by screwing two pipes into the two ends of the retort, and as these joints need not be disconnected they may with ease be made tight.

The valve although made of cast iron without any finish and resting upon a seat of the same character becomes after a few minutes use sufficiently tight for all practical purposes owing to a slight accumulation of residuum around it and also to the fact that the pressure of gas on the two sides thereof is equal. The small tube attached gas tight to the top of the water vessel and extending below the level of the liquid there contained in combination with a tube passing through it and nearly in contact with its inner surface and having holes in its sides as at *v v* for the escape of gas, constitutes as a whole an easy and safe method of connecting a gas pipe with a vessel containing water by a gas tight joint.

By inspection of the drawings it will be perceived, that water is present between the two tubes, and that gas cannot escape between them unless it should happen to rise directly under the ring or opening between the tubes. The gas passing out of the side orifices with some little force is carried from under this ring and rises outside of the tube attached to the condensed and careful experiment has proved that the joint thus made is gas tight.

My apparatus may be variously modified provided it is so constructed as to produce the effects described and required, the shape of the inner cavity of the retort is comparatively unimportant, so is the precise section of the passages and the number thereof.

I have found from four to six to be a proper number for a gas retort shaped substantially as shown in the drawings and having the relative heating surface there exhibited of still and passages. The valve may be of any desired shape but a sphere is most convenient as it always seats itself properly. I prefer to cast the still and passages in one piece with the ball or valve inclosed but they may be constructed in pieces and properly joined together.

Having thus described my gas generator I claim as of my own invention—

1. The combination of a still with passages leading therefrom, downward to a pipe and so combined therewith as to protect the still from heat, the two being constructed and acting substantially as specified.

2. I claim in combination, a gas still, converting passages and a valve all combined substantially in the manner and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto subscribed my name in the city of New York on this fourteenth day of April A. D. 1858.

ALLEN B. WILSON.

In presence of—
WM. LEE,
WM. M. FARRINGTON.