A. B. DUFF.

BLOWER FOR GAS PRODUCERS.

APPLICATION FILED APR. 20, 1911.

1,022,388. Patented Apr. 2, 1912.

FIG. 1.

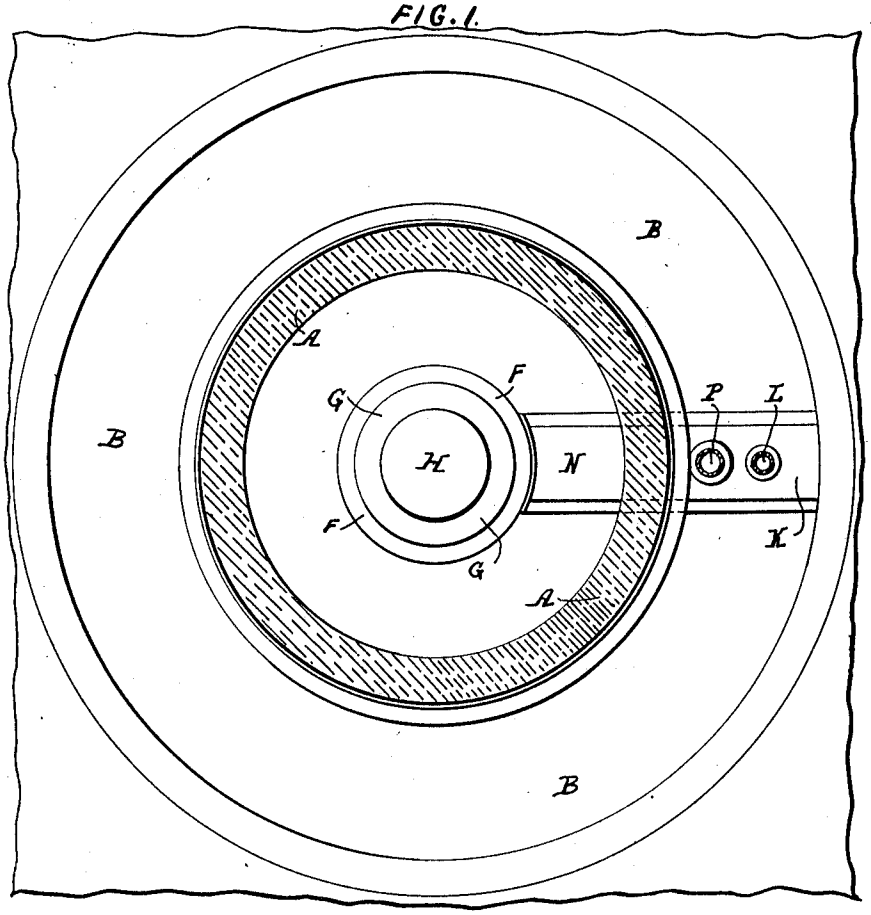
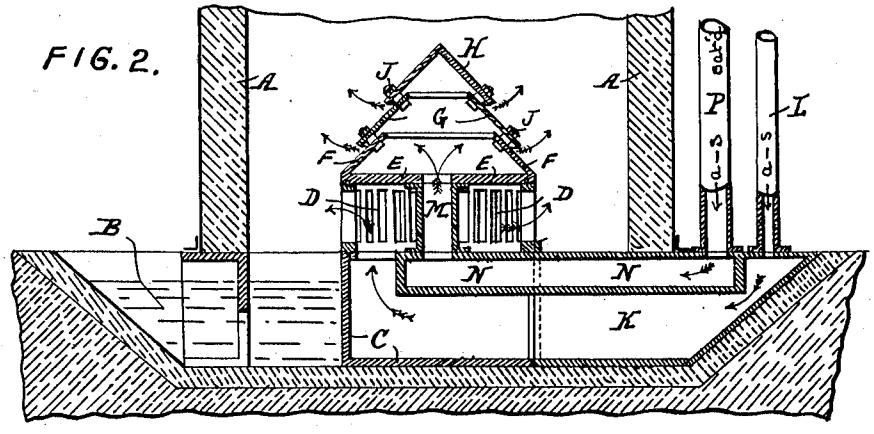


FIG. 2.



WITNESSES

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BLOWER FOR GAS-PRODUCERS.

1,022,388. Specification of Letters Patent. Patented Apr. 2, 1912.

Application filed April 20, 1911. Serial No. 622,403.

To all whom it may concern:

Be it known that I, ALFRED BARKER DUFF, a subject of the King of Great Britain and Ireland, and a resident of Pittsburgh, Pennsylvania, United States of America, have invented a certain new and useful Improved Blower for Gas-Producers, and of which the following is the specification.

In the usual process for the production of ammonia by the combustion of coal in a gas producer in the presence of steam, a volume of steam largely in excess of that required for the conversion of the nitrogen of the coal into ammonia must be used in order to prevent the ammonia formed being decomposed by the heat of combustion. As this large excess of steam is not decomposed, it has had the effect, where coal of a readily coking nature has been attempted to be used, of quenching the coke formed, and thus preventing its complete combustion which is necessary to give the best yield of ammonia. It has not therefore hitherto been possible to use coal of this nature with advantage in ammonia recovery gas producers worked by the process referred to. In such gas producers the combined air and steam is usually delivered by a blower arranged in the bottom of the producer, and this invention has for its object to improve the construction of such blowers, so that the steam and air supplied to the fuel being gasified may be distributed in such manner as to insure that the coal used, even when of a readily coking nature, is perfectly reduced to ashes, while at the same time the decomposition of the ammonia formed is prevented by the presence of the necessary excess of steam over that required to convert the nitrogen of the coal into ammonia.

The improved blower comprises essentially upper and lower parts of any suitable known form, and separated one from the other, the upper part receiving and delivering the usual fully saturated and preferably superheated blast of air and steam, while the blast introduced by the lower part carries less steam and more air, so that any partly burned coal which has passed the higher blower is kept incandescent until completely reduced to ashes. This lower blast may also be superheated if desired.

Figure 1 on the accompanying sheet of explanatory drawings is a sectional plan, and Fig. 2 a sectional elevation of part of a gas producer sufficient to show an example of the improved blower.

As shown in the drawings, the shell A of the producer, lined with firebrick, is circular in plan and carried as usual over a water-luted ash trough B. In the center of the trough B there is built a casing C upon which is superposed a ring of vertical gratings D preferably in sections bolted together although this precise structure and arrangement of the grating and ring may be varied as desired. On the grating ring D is a cover plate E carrying a conical louver ring F above which is a second conical louver ring G, and on the top of this second ring a conical cover H. The two louver rings and the cover are held together by bolts and distance pieces J at intervals, so that air spaces are left between the rings F, G, and the cover H. Only one or more than the two louver rings shown may be used. The blower thus far described is of known form, except that it is divided into two parts entirely separate the one from the other by the cover plate E over the lower grating ring D.

A duct K communicates at one end with the casing C and at the other end with a blower pipe L outside the producer A. Through the center of the grating ring D there extends a pipe M communicating at its upper end through an opening in the cover plate E with the upper coned part of the blower, and at its lower end with one end of a second duct N the opposite end of which communicates with a second blower pipe P outside the producer A.

The usual blast of air fully saturated with steam and preferably superheated is led by the pipe P, the duct N, and the pipe M to the upper part of the blower; while a lesser quantity of air and steam taken from the usual heat exchanging towers of the plant is led by the pipe L and duct K to the casing C. If desired this second blast may have additional steam added to it in its passage to the blower pipe L and it may also be superheated. The fully saturated and superheated blast passes from the upper part of the blower into the producer, and as it carries the usual excess of steam over that required for the conversion of the nitrogen of the coal into ammonia, the ammonia formed is thereby as usual prevented from being decomposed by the heat generated by

combustion or gasification of the fuel. The second blast passes from the casing C into the producer through the lower grating part D of the blower, and as it carries less steam and more air than the upper blast, it will prevent the steam in the upper blast from quenching the coke formed as it descends past the upper part of the blower and will keep it incandescent until completely reduced to ashes.

It is to be understood that the producer shell, instead of being circular in plan, may be square or of other desired shape. In this case, the improved blower described will be shaped to suit the internal space in the producer, that is, it may be arranged to only occupy the center of the producer, or it may be arranged to extend from one side of the producer casing to the other side in the form of a casing carrying the lower more or less vertical grating, the upper separate cone part taking the form of an angular louvered hood or cover.

What I claim is:—

1. A blower for gas producers, comprising a casing, a lower grating with substantially vertical walls carried thereon, an upper louvered hood having a closed top superposed on the grating, a cover on the grating separating it from the hood, and independent conduits opening to said hood and grating for leading thereto respectively a blast of fully saturated and preferably superheated, steam and air and a blast carrying more air and less steam, for the purpose described.

2. A blower for gas producers, comprising a circular casing, a ring grating carried thereon, an inclosing cover plate on the upper side of said grating, a conical louver ring device carried by said cover plate, a conical cover on the louver ring device and independent conduits opening to said louver and grating ring device for leading thereto respectively a blast of fully saturated and preferably superheated, steam and air and a blast carrying more air and less steam, for the purpose described.

3. A blower for gas producers, comprising a casing, a grating ring with substantially vertical walls mounted thereon, a louvered hood superposed in said grating, a cover separating said grating from the hood, a pipe extending through the grating chamber and its cover and opening to the interior of said hood, in combination with independent conduits leading from said grating chamber and pipe respectively to the exterior of the producer, for connecting said pipe to a blast of fully saturated and preferably superheated steam and air, and said grating to a blast carrying more air and less steam, for the purpose described.

4. A blower for gas producers, comprising a circular casing, a grating ring with substantially vertical walls mounted thereon, an inclosing cover plate on the upper side of said grating, a conical louver ring device carried by said cover plate, a conical cover on said louver ring device, a pipe extending through the grating chamber and its cover and opening into the interior of the louver ring device, in combination with independent conduits leading from said grating chamber and pipe respectively to the exterior of the producer, for connecting said pipe to a blast of fully saturated and preferably superheated steam and air, and said grating to a blast carrying more air and less steam, for the purpose described.

In testimony whereof I have signed my name to this specification, in the presence of the subscribing witnesses.

ALF. BARKER DUFF.

Witnesses:
HARRIET BARKER,
MYRTLE SCHUETTE,
IVA M. WOLCOTT.