

(No Model.)

G. E. WOODS.
SAFETY DEVICE FOR GAS PRODUCERS.

No. 570,149.

Patented Oct. 27, 1896.

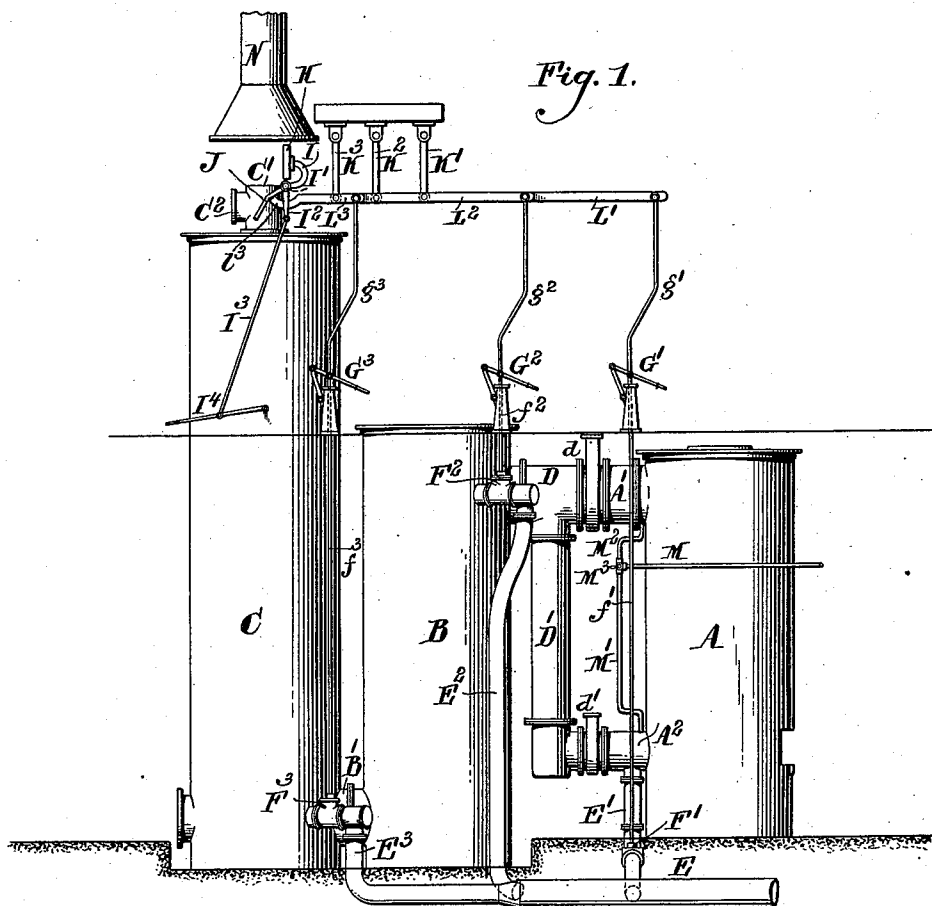


Fig. 2.

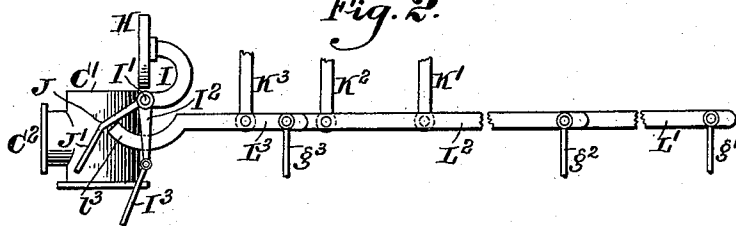


Fig. 3.



Witnesses.

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GEORGE E. WOODS, OF NEW YORK, N. Y., ASSIGNOR TO ALEXANDER C. HUMPHREYS AND ARTHUR G. GLASGOW, OF SAME PLACE.

SAFETY DEVICE FOR GAS-PRODUCERS.

SPECIFICATION forming part of Letters Patent No. 570,149, dated October 27, 1896:

Application filed March 16, 1896. Serial No. 583,276. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. WOODS, a citizen of the United States, residing in the city and county of New York, in the State of New York, have invented a certain new and useful Improvement in Safety Devices for Gas-Producers, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of the specification.

My invention relates to apparatus used in the manufacture of water-gas, and in which there is an alternate production of water-gas and of fuel-gas, the latter gas being produced in the process of bringing the generator and connected parts of the apparatus to a proper temperature for the production of water-gas. In the process of bringing the apparatus to a properly high temperature for the production of water-gas air is forced into the generator and into the parts generally known as the "carbureting" and "fixing" chambers, while in the manufacture of water-gas steam is forced into the generator and the air cut off from all parts of the apparatus traversed by the water-gas, and in case, by inadvertence or otherwise, air is not excluded from the apparatus while water-gas is being manufactured there is danger of the formation and ignition of an explosive mixture of water-gas and air, which is not only perilous to those employed about the apparatus, but also endangers the apparatus itself.

Now the object of my invention is to provide means by which the danger of the formation of an explosive mixture in the apparatus is avoided, and this I accomplish by interlocking the blast-valves, which control the admission of air to the various parts of the apparatus, with the valve controlling the take-off pipe, through which the products of combustion are led away from the apparatus, and I effect this interlocking of the parts referred to in such a way as either to prevent the closing of the take-off valve as long as any of the blast-valves are open or to prevent the opening of any of the blast-valves as long as the take-off valve is closed. Preferably I effect the interlocking in such a way as to accomplish both of the functions above noted.

The precise character of the interlocking mechanism employed may be very greatly varied, and obviously the interlocking mechanism may be connected either with parts of the apparatus which convey motion to the valves in question or with parts of the apparatus actuated by the motion of the said valves, these being but improvements of mechanical skill and capable of great variation.

In the drawings which form a part of this specification I have shown an interlocking device of simple and efficient construction which has been found to give satisfactory service in practical use and which embodies my invention in a form which provides for both of the functions hereinabove described.

Reference being now had to the drawings, Figure 1 is an elevation of a gas-producing apparatus provided with an interlocking device embodying my invention. Fig. 2 is an enlarged view of a portion of the apparatus shown in Fig. 1; Fig. 3, a plan view of the devices shown in Fig. 2, and Fig. 4 a perspective view of the interlocking device illustrated in the other figures.

A is a water-gas generator and, as shown, is provided with take-off pipes both at top and bottom, (indicated at A' and A².) D being a conduit through which the gases pass to the carbureting-chambers, (indicated at B,) and this pipe D being connected directly with the conduit A' and through branch D' with the conduit A², *d* and *d'* being valves situated in the conduits A' and A², by which either can be closed at will.

B, as already mentioned, is in the plan shown a carbureting-chamber connecting through a conduit B' with a fixing-chamber C.

As all of the chambers A, B, and C are of familiar and usual construction I have not thought it necessary to indicate their internal construction.

At the top of the fixing-chamber C is a take-off pipe C', having, as shown, an opening at its top leading into a stack N and a lateral opening C², through which water-gas is led to any convenient purifying and storing device.

E is an air-blast pipe having, as shown, a branch E', leading into the bottom of the generator through the pipe A², a branch E²,

leading into the top of the carbureting-chamber, and a branch E³, leading into the bottom of the fixing-chamber.

F', F², and F³ are valves by which the various branches of the blast-pipe are opened and closed at will and which I will refer to as "blast-valves." These valves are actuated, as shown, by the levers G', G², and G³, f', f², and f³ indicating the connections between the levers and the valves, and g', g², and g³ indicating connections between the levers and a corresponding system of levers L', L², and L³, each of which, as shown, is pivoted to rods K', K², and K³, depending from a support above the levers, for instance, the roof of the building. The ends l', l², and l³ of the pivoted levers are, as shown, formed in the shape of a segment of a circle and not in the same plane.

H is a valve by which the blast-opening in the pipe C' is closed or opened, and I will refer to this valve hereinafter as the "take-off" valve. It is, in the construction illustrated, secured by a lever-arm I to a transverse operating-shaft I', to which shaft is also secured a lever-arm I², from which a connection I³ leads to an actuating-lever I⁴. To the shaft I' is secured, in the plan illustrated, a locking device J, having a transversely-extending face-plate J' and an open space indicated at J² between said face-plate and the shaft I'. The ends l', l², and l³ of the pivoted levers are brought into such relation with the locking device J that when the said pivot-levers are in the position occupied by them when the blast-valves are closed they will not interfere with the free motion of the locking device J or of the take-off valve H; but in case of the movement of any of the pivoted levers to the position it occupies when its corresponding blast-valve is open then its end will come opposite to the face-plate J' and prevent the closing of the take-off valve H, and by this interlocking I effectually prevent the closing of the take-off valve so long as any of the blast-valves are open.

My reason for forming the ends l', &c., of the pivoted levers with the curved shape, as illustrated, is so that in case the valve H is closed or only partly open it will be impossible to open any of the blast-valves, and it will be seen that when the valve H is closed and the face-plate J' moved downward and backward the top of this plate will lie in contact with or in close proximity to the curved ends of the pivoted levers and will prevent these curved ends from moving downward; but as a downward motion of the curved ends of the pivoted levers is a necessary consequence of the inward movement of their pivoted ends it is thus obvious that the pivoted levers are locked in position and through them the blast-valves locked in their closed position until the take-off valve is fully open.

I am aware that heretofore gas apparatus has been designed in which a number of valves have been so coupled as to move to-

gether in a determined manner. My invention, however, is distinguished from such construction in that I provide not for a simultaneous movement, but for absolutely locking one or more valves against movement when another valve or valves are in a determined position.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a water-gas apparatus having air-blast pipes leading to various parts thereof for promoting combustion and effecting the proper heating thereof, said blast-pipes being provided with valves and said apparatus having also separate take-off pipes for products of combustion and for water-gas, and a valve for opening and closing the take-off pipe for products of combustion, the combination of the valves controlling the air-blast pipes and the valve controlling the take-off pipe with interlocking mechanism whereby the closing of the take-off valve locks and prevents the opening of the blast-valves so long as said take-off valve remains closed.

2. In a water-gas apparatus having air-blast pipes leading to various parts thereof for promoting combustion and effecting the proper heating thereof, said blast-pipes being provided with valves, and said apparatus having also separate take-off pipes for products of combustion and for water-gas and a valve for opening and closing the take-off pipe for products of combustion, the combination of the valves controlling the air-blast pipes and the valve controlling the take-off pipe with interlocking mechanism whereby the opening of one or more of the blast-valves locks and prevents the closing of the take-off valve so long as said blast valve or valves remain open.

3. In a water-gas apparatus having air-blast pipes leading to various parts thereof for promoting combustion and effecting the proper heating thereof said blast-pipes being provided with valves and said apparatus having also separate take-off pipes for products of combustion and for water-gas and a valve for closing and opening the take-off pipe for products of combustion, the combination of the valve controlling the air-blast pipes and the valve controlling the take-off pipe with interlocking mechanism whereby the opening of one or more of the blast-valves locks and prevents the closing of the take-off valve so long as said blast-valve is open and the closing of the take-off valve locks and prevents the opening of the blast-valves so long as said take-off valve is closed.

4. In a water-gas apparatus having air-blast pipes leading to various parts thereof for promoting combustion and effecting the proper heating thereof said blast-pipes being provided with valves and said apparatus having also separate take-off pipes for products of combustion and for water-gas and a valve for opening and closing the take-off pipe for products of combustion, the combination of

the take-off valve having an actuating-shaft as I' with a locking device as J secured to said shaft, a series of pivoted levers as L' L² L³ connecting with the blast-valves, one connected to the end of each lever, said levers
5 being arranged as specified so that their ends l' l² l³ will engage with the locking device J and prevent the closing of the take-off valve when any blast-valve is open.
10 5. In a water-gas apparatus having air-blast pipes leading to various parts thereof for promoting combustion and effecting the proper heating thereof said blast-pipes being provided with valves, and said apparatus hav-
15 ing also separate take-off pipes for products of combustion and for water-gas and a valve

for closing and opening the take-off pipe for products of combustion, the combination of the take-off valve having an actuating-shaft as I' with a locking device as J secured to said shaft, a series of pivoted levers as L' L² L³, connecting with the blast-valves one connected to the end of each lever, said levers being arranged as specified so that their ends l' l² l³ will engage with the locking device J
25 and prevent the opening of the blast-valves when the take-off valve is closed.

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Witnesses:

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