

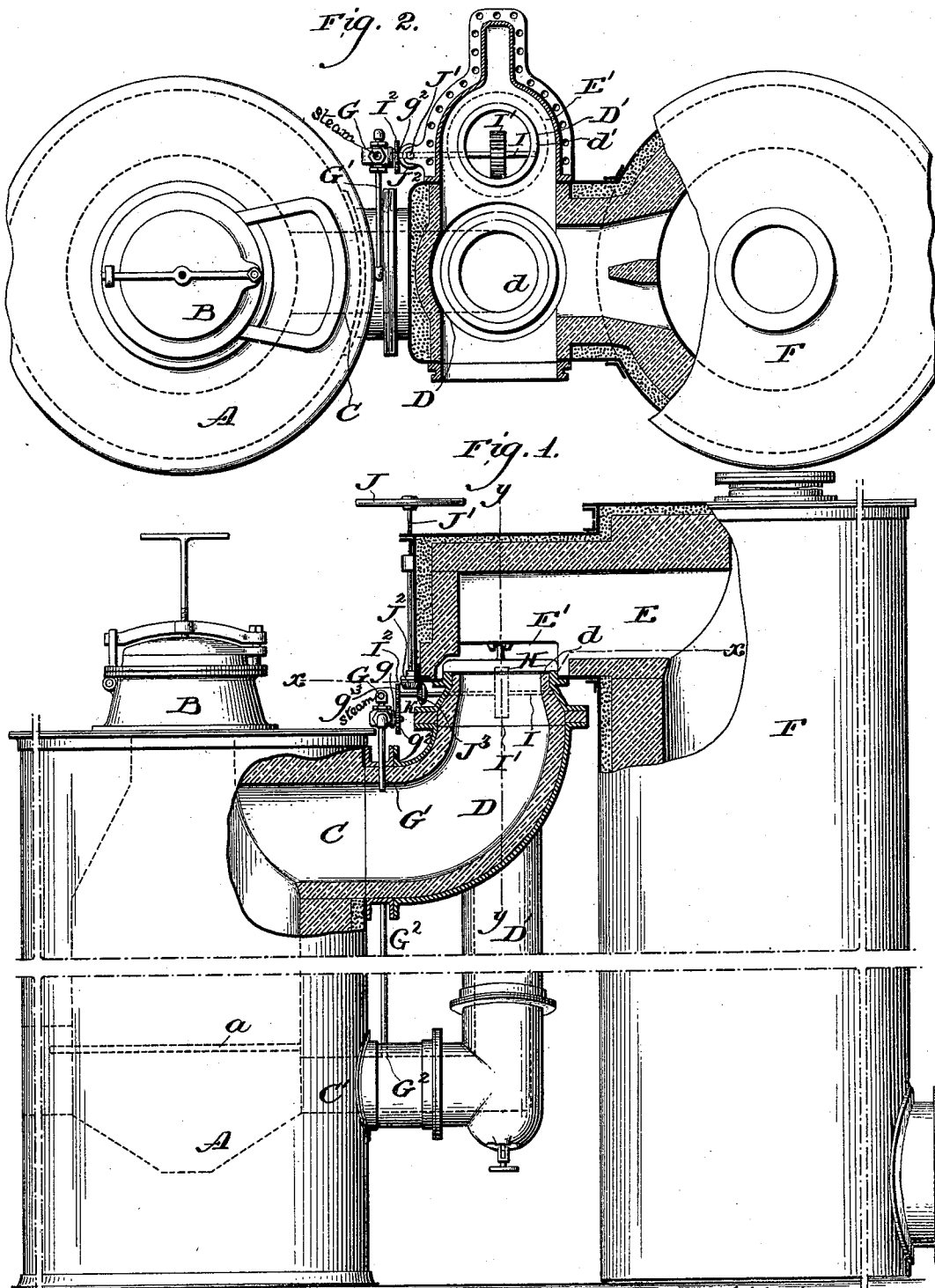
(No Model.)

2 Sheets—Sheet 1.

A. G. GLASGOW.
WATER GAS APPARATUS.

No. 519,040.

Patented May 1, 1894.



WITNESSES:
Edw. Williams & Co.
Stewart

INVENTOR:
Arthur G. Glasgow
by his atty.
Francis J. Chambers

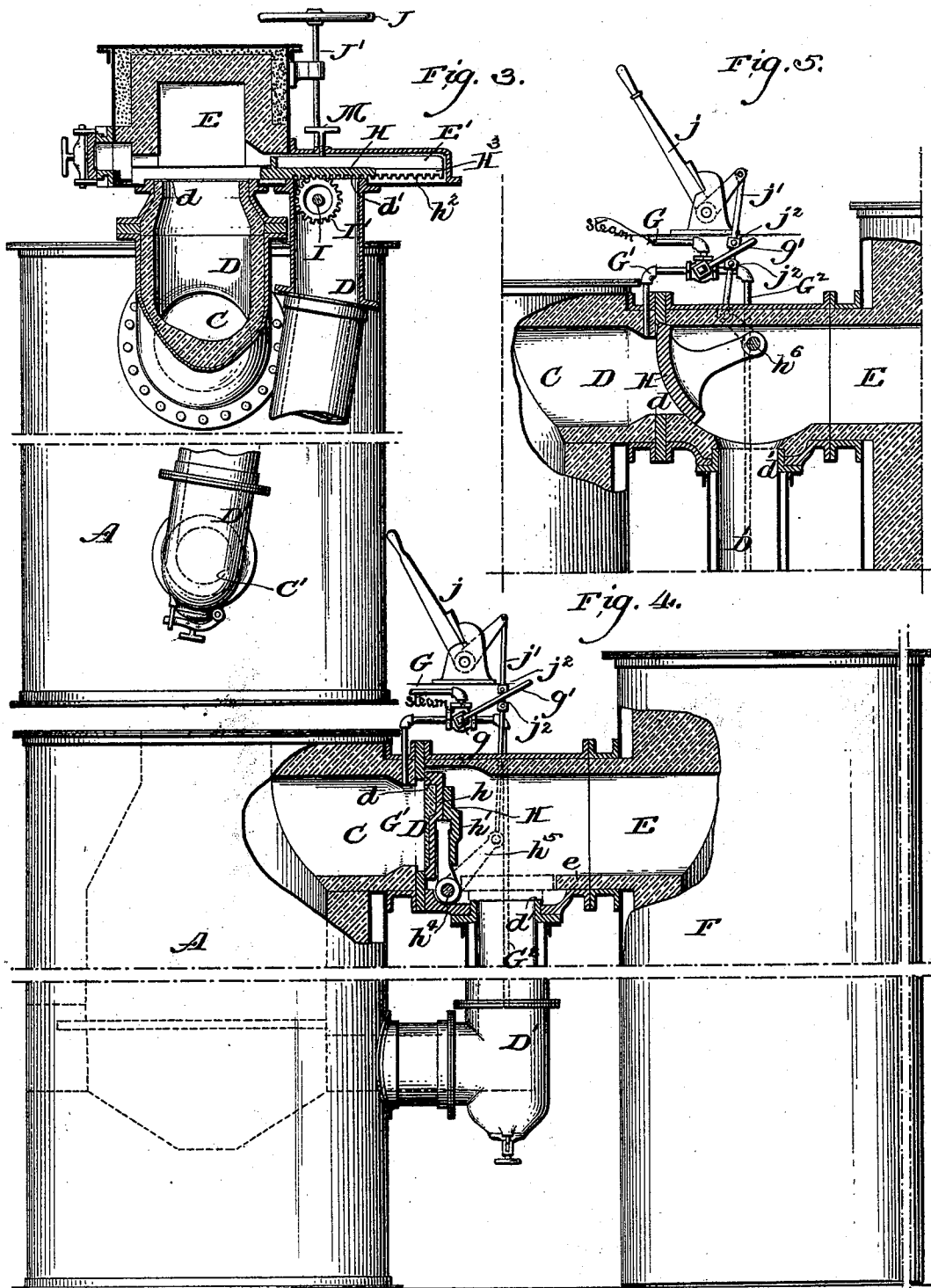
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David S. Williams
DeWard

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UNITED STATES PATENT OFFICE.

ARTHUR G. GLASGOW, OF LONDON, ENGLAND.

WATER-GAS APPARATUS.

SPECIFICATION forming part of Letters Patent No. 519,040, dated May 1, 1894.

Application filed October 25, 1893. Serial No. 489,110. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR G. GLASGOW, a citizen of the United States, residing in London, in the county of Middlesex, England, have invented a certain new and useful Improvement in Water-Gas Apparatus, of which the following is a true description, reference being had to the accompanying drawings, which form a part hereof.

My invention relates to water gas apparatus, particularly to such apparatus as are provided with suitable conduits leading from above and below the grate, or other support, for the mass of incandescent carbon which serves to decompose the steam and form water gas so that the gas can be made both up and down; and the main object of the invention is to so arrange the openings of these two conduits into a common conduit that the hot gases issuing from one conduit will not impinge on the opening of the other and provide a common valve to close alternately both of these openings.

My invention will be best understood as explained in connection with the accompanying drawings, in which—

Figure 1 is a side elevation partly in section of an apparatus embodying my invention. Fig. 2 is a plan view partly in section on the line $x-x$ of Fig. 1. Fig. 3 is a view partly in section on the line $y-y$ of Fig. 1. Fig. 4 is a view similar to that shown in Fig. 1, showing a modified form of gas valve, and Fig. 5 is a view illustrating another form of gas valves.

A is a water gas generator having a cap B and a grate or other suitable support for the fuel as indicated at a .

C C' are passages for the gas situated respectively near the top and bottom of the generator, that is, above and below the grate or support a .

DD' are gas conduits leading from the passages C C' and open into a common conduit E; as shown, their openings $d d'$ are close together so that a single valve H can be operated so as to alternately close the openings. Any suitable means can be employed to actuate the valve H.

In Fig. 1, a hand wheel J having a stem J' is shown operating a shaft I by means of gears J² J³, a pinion I' is secured on the shaft I and

meshes with the teeth of a rack h^2 on the valve H which in this case is a slide valve; by turning the hand wheel J the valve may thus be slid to cover either the opening d or d' and thus permit the gas driven from the generator by the steam blast to escape by means of either one of the conduits D or D' as preferred.

In Fig. 4 the valve H is shown as a swing valve pivoted as at h^4 and provided with seating faces $h h'$, on its front and back which are adapted to seat on the valve seats at d and d' and so close one or the other of the conduits; this valve is shown operated by means of a handle or lever j having a rod j' connected therewith which is secured to rock shaft h^5 secured to the valve. In Fig. 5 a similar lever is shown operating a rocking cylinder valve pivoted at h^6 .

It is evident that any construction of suitable valves may be employed to close alternately one or the other of the conduits D D'. A construction including pivoted valves is not specifically claimed in this application but is made the subject of another application for Letters Patent, filed October 25, 1893, and serially numbered 489,111.

G is a steam pipe leading from any suitable boiler a suitable valve (not shown) being of course arranged in the pipe whereby the steam can be turned into or off from the pipe; and the pipe G is provided with two branches G' G² leading to the top and bottom of the generator respectively; a valve g is arranged to direct the steam from the pipe G into one or the other of the branches G' G². In order to operate this valve to properly direct the steam blast in accordance as the upper or lower conduit D or D' is open preferably connect the steam valve with the means for operating the gas valve so that both can be moved at one operation; this can be done in any convenient manner. In Figs. 1 and 2 a small gear g^2 on the stem of the valve g meshes with a gear g^3 on the shaft I of pinion I' and is adapted to operate the valve g so as to direct the steam into branches G' or G² as the valve H is slid so as to cover the openings d or d' ; in Figs. 4 and 5 the valve g is shown with a projecting rod g' which is loosely held between two lugs j^2 on the rod j' and serves to operate the valve g as the rod j' is moved up and down to operate the valve

H. In operation the valve H is so turned as to open the conduit D leading from the upper part of the generator, a fire is kindled on the grate *a*, a suitable blast is introduced and a deep bed of incandescent fuel is thus obtained, the blast gases escaping out the conduits D and E and serve when ignited by a suitable air blast in the carbureter F to heat this in the customary manner.

It will be observed that the valve H in each of the constructions is so arranged that it will be entirely out of the way of the intensely hot blast gases; the swing valve shown in Fig. 4 is adapted, when swung into the position indicated by the dotted lines, to be flush with the floor *e* of conduit E so that the hot gases will flow over the valve and will not impinge directly on any part of it; the same is true of the valve shown in Fig. 5. In the arrangement shown in Fig. 1 the conduit E is preferably provided with an extension E', the conduit D opening directly into the conduit E and the conduit D' into the extension E', the openings *d d'* of said conduits being side by side as shown, when blasting, the valve is slid to cover the opening *d'* and is moved back into the extension E' entirely out of the path of the blast gases the rack and pinion being beneath the disk, no dust or cinder, blown forward, can interfere with its working. After the blast has been shut off the gas valve is moved to open the conduit D or D' as may be desired, and steam is turned into the pipe G the steam being turned into the opposite end of the generator from that from which the open conduit leads.

If desired, the gas valve shown in Fig. 3 can be clamped in the position shown by means of a screw M to prevent any tendency toward leaking, and as best shown in this figure, the valve is preferably provided with a toothed tail piece H³ forming a continuation of the rack *h*² which tail piece is comparatively thin so that it will not interfere with the draft of gas through the conduit D' but will serve to mesh with the teeth on the pinion when the valve is in its forward position covering the conduit D; the pinion I' and this comparatively narrow rack are entirely in the conduit D' leading from the bottom of the generator, and so are never subject to the intense heat of the blast gases, and are at all times free from the dust and cinders blown forward during blasting.

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

1. In a water gas apparatus the combination with a generator having gas passages at its top and bottom, of separate conduits D D' leading from said passages, a common conduit E into which the conduits D D' open, the openings *d d'* of the conduits D D' into the conduit E being out of line with each other, a common valve arranged in conduit E to alternately close one or the other of the openings *d* and *d'* of the conduits D and D' and

means for operating said valve, all substantially as specified and so that when closing either of the openings said valve will be out of the path of the hot gases issuing from the other.

2. In a water gas apparatus the combination with a generator having gas passages at its top and bottom, of separate conduits D D' leading from said passages, a common conduit E into which the conduits D D' open, the openings *d d'* of the conduits D D' into the conduit E being out of line with each other, a common valve arranged in conduit E to alternately close one or the other of the openings *d* and *d'* of the conduits D and D', a steam pipe G having branches G' and G² leading to the top and bottom of the generator respectively, a valve adapted to direct the steam from pipe G into one or the other of the branches G' or G² and means for operating the valve in conduit E and the steam valve at one operation, all substantially as specified and so that when closing either of the openings said valve will be out of the paths of the hot gases issuing from the other.

3. In a water gas apparatus, a generator having passages at its top and bottom, conduits D D' leading from said passages, a common conduit E into which the conduits D D' open, the openings *d d'* of the said conduits into the conduit E being side by side, a common slide valve arranged in the conduit E and adapted to slide from one opening to the other and so arranged that when slid across either opening said slide valve will be out of the path of the hot gases issuing from the other, and means for sliding said valve from one opening to the other.

4. In a water gas apparatus, a generator having passages at its top and bottom, conduits D D' leading from said passages, a common conduit E into which the conduits D D' open, the openings *d d'* of the said conduits into the common conduit E being side by side, a common slide valve arranged in the conduit E, and so arranged that when slid across either opening said slide valve will be out of the path of the hot gases issuing from the other, a rack secured to said valve, a pinion adapted to mesh with the rack on the valve and operating to slide the valve from one opening to the other.

5. In a water gas apparatus, a generator having passages at its top and bottom, conduits D D' leading therefrom, a common conduit E into which said conduits open, the openings *d d'* thereof being arranged side by side, a common slide valve arranged in the conduit E and adapted to slide from one opening to the other and so arranged that when slid across either opening said slide valve will be out of the path of the hot gases issuing from the other, a steam pipe G having branches G' G² leading to the top and bottom of the boiler respectively, a valve *g* adapted to direct the steam from the steam pipe into one or the other of the branches G'

G² and means for operating both the steam and slide valve at one operation.

6. In a water gas apparatus, a generator having passages at its top and bottom, conduits D D' leading therefrom, a common conduit E having a side extension E', the conduit D from the top of the generator opening directly into the conduit E and the conduit D' into the conduit E through the extension E', a common slide valve adapted to alternately close the openings *d d'* and so arranged that when moved to open the opening *d* of conduit D it will be slid into the extension E' out of the way of the hot blast gases escaping from the generator.

7. In a water gas apparatus, a generator having passages for gas at its top and bottom, conduits D D' leading from said passages, a common conduit E into which the conduits D D' open, the opening *d d'* of these conduits being side by side, a common slide valve arranged in the conduit E and so arranged that when slid across either opening said slide valve will be out of the path of the

hot gases issuing from the other, and means situated entirely out of the path of the hot blast gases escaping through conduit D from the top of the generator for sliding the valve H so that it will cover the opening *d* of the conduit D or the opening *d'* of the conduit D' as may be desired.

8. In a water gas apparatus, a generator having passages for gas at its top and bottom, conduits D D' leading from said passages, a common conduit E into which said conduits D D' open, the openings *d d'* of said conduits being side by side, a common slide valve arranged in the conduit E having a tail piece H³ and a rack *h*² extending along the tail piece, a pinion I' arranged to mesh with the rack and slide the valve so as to cover the opening *d* of conduit D or the opening *d'* of the conduit D'.

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Witnesses:

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