No. 817,211. PATENTED APR. 10, 1906.

J. WILLIAMSON.

VALVE FOR WATER GAS PLANTS.

APPLICATION FILED MAR. 11, 1905.

2 SHEETS—SHEET 1.

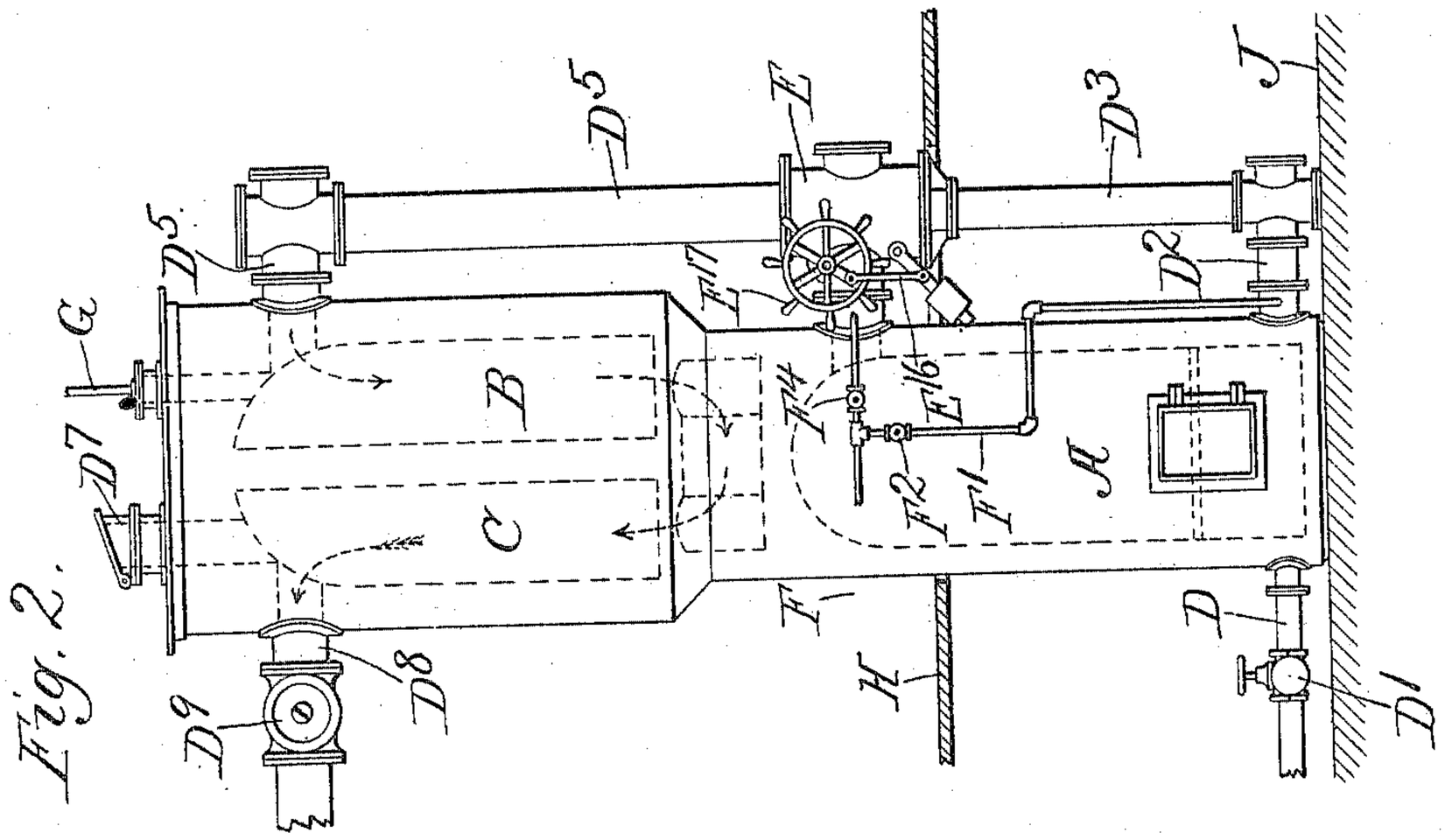

Fig. 2.

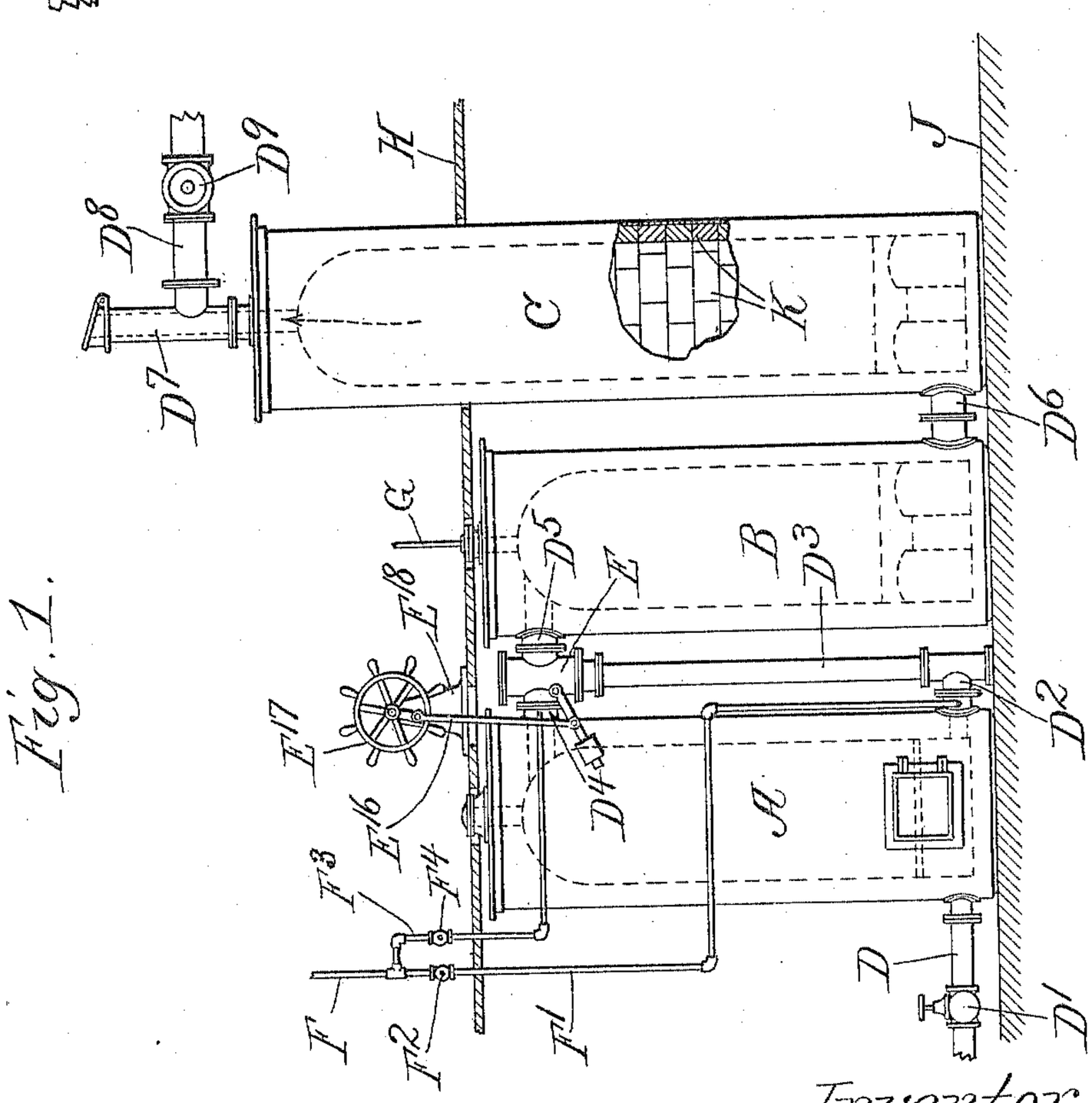

Fig. 1.

Witnesses.
Edward T. Wray.
Homer L. Kraft.

Inventor.
John Williamson.
by Parker & Burton
Attorney's.

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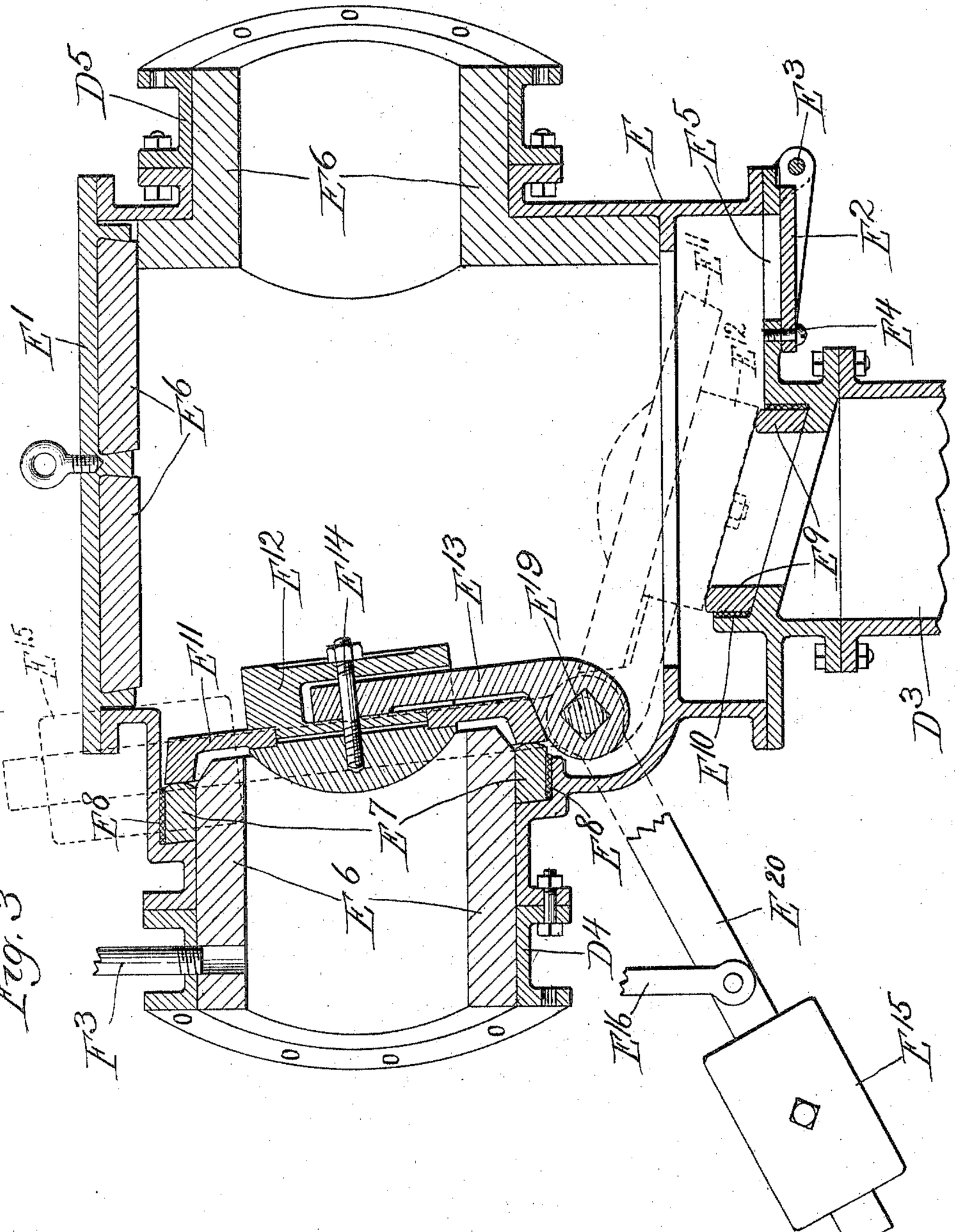

Fig. 3

Witnesses.
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Howard Kropf.

Inventor.
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UNITED STATES PATENT OFFICE.

JOHN WILLIAMSON, OF CHICAGO, ILLINOIS.

VALVE FOR WATER-GAS PLANTS.

No. 817,211. Specification of Letters Patent. Patented April 10, 1906.

Application filed March 11, 1905. Serial No. 249,547.

To all whom it may concern:

Be it known that I, JOHN WILLIAMSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Valves for Water-Gas Plants, of which the following is a specification.

My invention relates to valves, particularly such as are used in connection with gas-generating machines. It is illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation, with parts broken away and others shown in dotted lines, of a gas-generating plant to which my valve is applicable. Fig. 2 is a similar view of a modified arrangement of such plant. Fig. 3 is a cross-section through such valve with parts shown in dotted lines for alternative position.

Like parts are indicated by the same letter in all the figures.

A is a furnace; B, a carbureter; C, a superheater.

D is an air-blast pipe controlled by the valve D′ and leading into the furnace A. From the bottom of the furnace a pipe D^2 leads into a vertical pipe D^3, which connects above with my valve E.

D^4 is a pipe connecting the upper part of the furnace with the valve; D^5, a pipe leading from the valve into the carbureter B.

D^6 is a pipe leading from the bottom of the carbureter into the superheater C, and D^7 is the stack leading from the top of the superheater C.

D^8 is a pipe leading from the stack or upper part of the superheater C, and controlled by the valve D^9.

F is a steam-supply pipe having one branch F′ controlled by the valve F^2, such branch leading into the pipe D^2. It has another branch F^3, controlled by the valve F^4 and discharging into the pipe D^4.

G is an oil-supply pipe opening into the carbureter B.

H is the operating-floor, and J is the basement-floor.

In the alternative form shown in Fig. 2 the arrangement is somewhat different as to some of the parts, for the carbureter and superheater are placed side by side and on top of the furnace.

K indicates the brick checker-work inside the superheater; but any interior arrangement of either of the parts A B C can be used. Hence I have not shown in detail the interior structures.

I shall now return to a more minute description of the valve E. It contains, associated with the case, a removable cover E′, a cleaning-door E^2, hinged at E^3 and secured in any desired manner—as, for example, by the set-screw E^4—and adapted to protect the cleaning-opening E^5. The several parts are lined with firebrick or the like so far as is possible, as indicated at E^6. E^7 is an annular valve-seat back of and protected by the firebrick E^6 and held in position by the packing E^8, which may be of asbestos. E^9 is a somewhat-similar valve-seat held in position by the packing E^{10}. The valve consists of four parts, as follows: the annular valve-rim E^{11}, shaped, as shown, so as to engage the valve-seat E^7 back of the firebrick E^6, the disk valve E^{12}, the holding-arm E^{13}, and the screw-bolt E^{14}, which secures the four parts together. The holding-arm E^{13} is pivoted on the axis E^{19} and is associated with an outer operating-arm E^{20}, carrying the weight E^{15} and connected by a link E^{16} eccentrically with the operating hand-wheel E^{17} on the support E^{18}.

The parts I have shown must be taken as in a sense diagrammatic and intended to illustrate in a general way the structure and form of my device rather than to display its final or most approved form.

The use and operation of my invention are as follows: In valves of this kind and used for this purpose there is of course a good deal of difficulty due to the fact that the valves are subjected to enormous heat. There is also trouble due to the fact that a furnace which takes the oxygen out of steam is liable to become choked or its fire cooled, so as to become less effective if the supply of steam is steadily passed through the furnace in one and the same direction. It is necessary, therefore, that the valve be double-acting or that it operate as a double-run valve. Keeping this in mind, I shall proceed to describe the invention. The interior of the valve is arranged so that it can be brick-lined fireproofed. That seat which is liable to exposure to the greatest heat during the operation of the air-blast is hidden out of sight and protected in such a way as to be little affected by such heat or at least to be protected from the products of combustion. The valve-seat associated with the vertical pipe does not need so much protection, although it can

be built in the same way, if desired, in which event an inwardly-projecting rim would be formed on the disk valve. The valve itself is arranged so that any one of its parts when warped or injured may be easily removed without loosening the others. By loosening the screw-bolt E^{14} the parts may be separated and the injured one removed. The counter-weight E^{15} is arranged so as to balance the valve and make it easy to operate. In the operation of the entire device the furnace is properly charged, the air-blast valve is open, and the operation of heating the entire plant and bringing the furnace to a proper condition is carried on. The air-blast enters at the bottom of the furnace, passes out through the top and through the valve, whose parts are in the position indicated in dotted lines in Fig. 3, thence down through the carbureter and up through the superheater and out through the stack, the valve D^9 being closed. When the parts are suitably heated, steam is supplied, for example, through the pipe F′, the valve being shown in the position indicated in dotted lines in Fig. 3. The steam passes up through the furnace, is freed of its oxygen, residuum passes into the top of the carbureter, to which oil is being supplied from the oil-pipe, the process of carburization takes place, the combination passes through the pipe D^6 into the superheater C, and thence out through the pipe D to the storage-tank. The valve D^9 is open, and the stack valve or cap is closed. This process if continued long enough will result in cooling the furnace, whereupon the flow of steam may be reversed by cutting off the valve F^2, opening the valve F^4, and supplying steam through the pipe F^3 into the pipe D^4. If the valve is placed in the position indicated in Fig. 3, the steam will pass down through the furnace, up the pipe D^3, and continue its course as before.

I claim—

1. In a valve device, the combination of a valve-casing with an opening therein, a valve-seat surrounding said opening, fireproofing extending around said opening within the valve-seat and projecting beyond the seat so as to protect the same, and a valve to close said opening.

2. In a valve device, the combination of a valve-casing with an opening therein, a valve-seat surrounding said opening, a protecting-lining in said opening and extending beyond the seat so as to protect the same, and a valve comprising a dish-shaped rim part to engage the seat.

3. In a valve device, the combination of a valve-casing with an opening therein, a valve-seat surrounding said opening, a protecting-lining in said opening and extending beyond the seat so as to protect the same, and a valve comprising a removable central disk, and a dish-shaped rim part to engage the valve-seat.

4. In a valve device, the combination of a valve-casing with an opening therein, a valve-seat surrounding said opening, a protecting-lining in said opening and extending beyond the seat so as to protect the same, a hinged flat valve comprising a supporting part, a removable central disk, an annular dish-shaped rim part, and means for securing such rim and disk to the supporting part.

5. In a valve device, the combination of a valve-casing having an inlet and an outlet, a valve to close the inlet, a valve-seat surrounding said inlet, and a fireproof lining for the inlet extending beyond the valve-seat.

6. In a valve device, the combination of a valve-casing having two inlets and an outlet, a double-run valve adapted to close one or the other of the inlets, valve-seats at said inlets, and a fireproof lining in one of said inlets projecting beyond the valve-seat.

JOHN WILLIAMSON.

Witnesses:
S. H. Moore,
J. H. Eustace.