

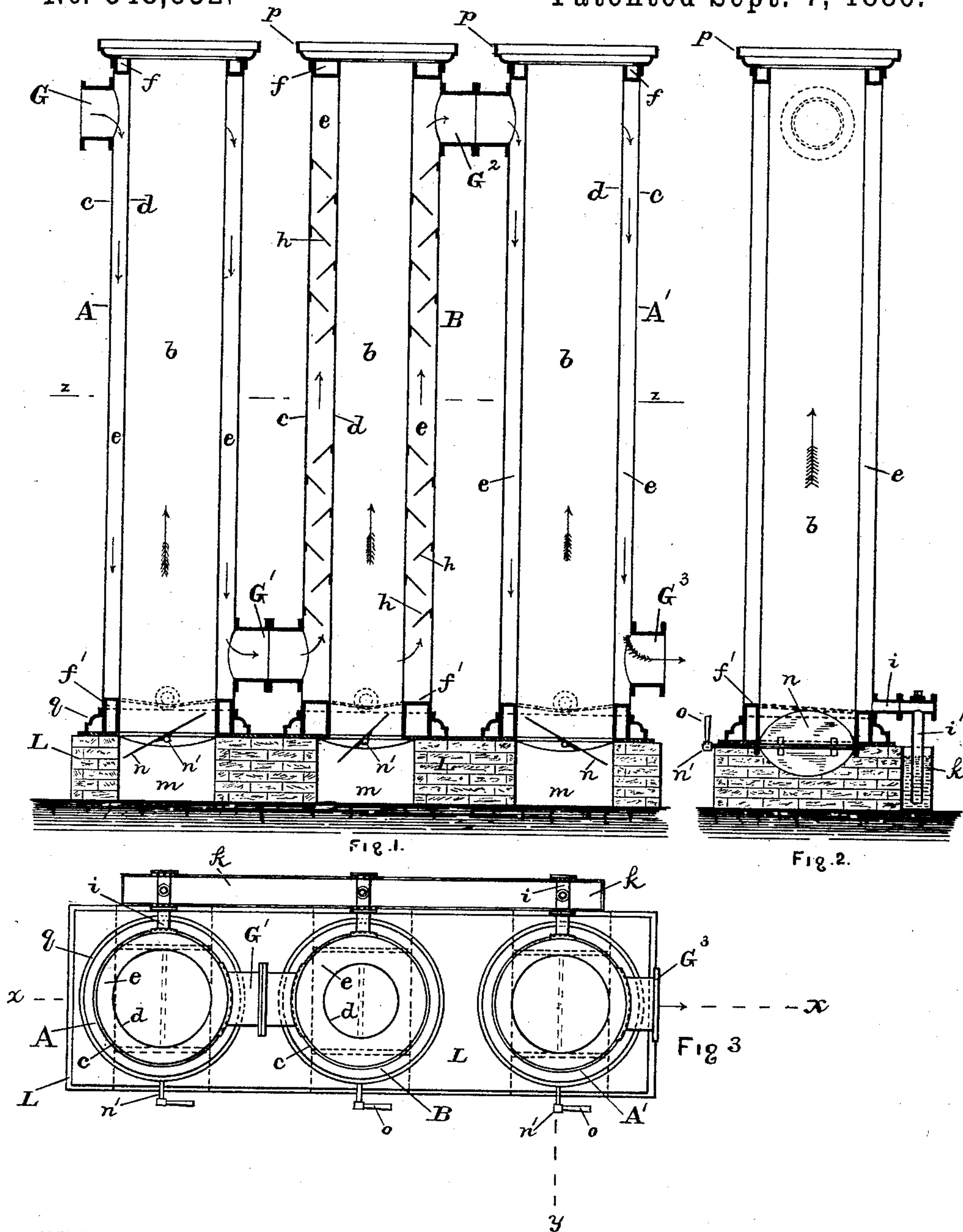
(No Model.)

A. DELANEY & W. SIMPKIN.

APPARATUS FOR THE PURIFICATION OF GAS.

No. 348,832.

Patented Sept. 7, 1886.



WITNESSES:

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ALEXANDER DELANEY AND WILLIAM SIMPKIN, OF RICHMOND, VIRGINIA.

APPARATUS FOR THE PURIFICATION OF GAS.

SPECIFICATION forming part of Letters Patent No. 348,832, dated September 7, 1886.

Application filed November 27, 1885. Serial No. 184,026. (No model.)

To all whom it may concern:

Be it known that we, ALEXANDER DELANEY and WILLIAM SIMPKIN, citizens of the United States, residing at Richmond, in the county of Henrico and State of Virginia, have invented certain new and useful Improvements in Gas Purifiers or Washers, of which the following is a specification.

Our invention relates to improvements in apparatus for the purification of gas; and it consists in certain features of construction and combinations of parts hereinafter described and claimed.

In the drawings herewith, Figure 1 is a sectional elevation of the apparatus on the line x of Fig. 3. Fig. 2 is a sectional elevation of one of the columns on the line y of Fig. 3. Fig. 3 is a horizontal section of the apparatus on the line z of Fig. 1.

The letters A and A' designate annular columns, which are also tubular or have a center chamber, b . Any number of these columns may be employed, varying according to the quantity of gas to be treated. With every two annular columns, like those designated by A, and between them, is a frictional column, B, which also is tubular or has a center chamber, b . Each column is composed of two cylinders, the outer cylinder, c , and the inner cylinder, d . The annular space e , between the outer and inner cylinder, is filled in or closed at the top by a ring, f , and at the bottom by a ring, f' . The annular space e is for the passage of the gas to be condensed, and the center chamber, b , is for the passage upward of cold air. There is no connection between the annular space and the center chamber.

A tubulure or nozzle, G , at or near the top of the first column, admits gas to the annular space e . The annular spaces e of adjoining columns are connected, the space of the first annular column, A, with the space of the frictional column B by a tubulure or nozzle, G' , at the bottom. Then the space of the frictional column B is connected with the space of the next annular column, A', by a tubulure or nozzle, G'' , at the top, and the space of this last column A' has at the bottom a tubulure or nozzle, G''' , for the outlet of the gas or for connection with another column. The area in cross-section of the annular space in each column

should be at least three times as great as the area of the connecting tubulure or nozzle in order to allow of a very slow flow of the gas through the annular space.

The annular space of the column B is larger than the space in the other columns, A, and the two cylinders c and d , forming this larger space, are each provided with horizontal deflector or friction plates h , which extend horizontally around the walls of the cylinders. These plates are shown as having a downward inclined position at an angle of about forty-five degrees, which is preferred; but they may have any other angle, or may project horizontally. The lower edge of the inclined plate forms a drip-edge. The friction-plates h in the annular gas-space are attached alternately to both the inner and outer cylinders, and the plates attached to one cylinder are arranged to come between or have position intermediate of the plates on the other cylinder. The friction-plates h here shown are ring-shaped, which is deemed preferable; but each plate need not necessarily extend entirely around the annular space. These plates are also narrower than the annular space.

At the rear side of each column, and at the lowermost point thereof, a tar-pipe, i , is attached. This pipe has a downward-pointing end, i' , which delivers into a trough, k , and is sealed in the usual manner. The bottom ring, f' , filling each annular space, has a slope or inclination toward the outlet, which delivers into the tar-pipe i , thereby the tar which accumulates upon the bottom is caused to drain off or discharge into the tar-pipe.

Gas-columns have been made with an annular gas-space, an open center air-chamber, and with a ring bottom filling the annular gas-space. Our ring bottom f' differs from those heretofore made in that ours slopes or inclines.

The center chamber of the columns A, A', and B are always open at the upper end, and said columns stand on suitable bases, L , of stone or brick, which have openings m below the center chamber. A damper, n , pivoted or swiveled on a shaft, n' , is placed across the lower end of each center chamber, the opening to which latter is thereby controlled. A hand-lever, o , is fixed on the end of the damper-shaft n' , and serves to actuate the damper.

The object of the damper is to provide for controlling the amount of cold air to be admitted to the center chamber, *b*, and this air regulates the temperature at which the condensation of gas is carried on. The hot gas in its passage through the annular spaces imparts heat to the metal cylinders, and when the inner cylinder has become heated a draft of air, entering at the opening *m* below, is caused to pass the damper and ascend the center chamber, *b*, of the column, as indicated by the arrows. This air-draft, as stated, is controlled by the damper.

The caps *p* and base plates *q* are merely for ornamentation.

In the operation of the condenser the hot gas to be purified, condensed, and deprived of its tar enters the top of the first column, *A*, at *G*, and passes slowly down the annular space of said column. Then passes through the connection *G'* into lower part of friction-column *B*, and occupies the annular space therein. Here the gas ascends, and in its course meets the friction-plates *h*, which serve to arrest the fine tar globules in the gas and break them up. The tar finds lodgement on the plates and therefrom drips below. The gas next passes through the connection *G''* into the annular space of the column *A'*, and here descends, as indicated by the darts, and passes off through the nozzle *G'''*. This can be carried on, if desired, by passing the gas through an additional combination of plain, annular, and frictional columns.

The combination of a plain annular column, wherein the gas is to pass downward, and an annular column having friction-plates, wherein the gas is to pass up, insures a slowness of flow of the gas that allows of the most thorough condensation and deposition of the tar.

Heating-drums for stove-pipes have heretofore been made comprising an outer and an inner drum with a surrounding space between the two, and spirally-arranged deflectors secured in said space in such way as to alternately divide and concentrate the smoke, whereby a larger percentage of the heat is utilized. This construction, however, is not only unlike ours, but its operation and function are entirely different and are unsuited for the purposes of a gas-condenser.

Having described our invention, we claim and desire to secure by Letters Patent of the United States—

1. A gas-condenser composed of an outer and an inner cylinder, having an annular gas-space, *e*, between the two, and an open center air-chamber, *b*, through the inner one, and provided in the annular gas-space with friction-plates *h*, narrower than the said space and attached alternately to the walls of both cylinders, for the purpose specified.

2. A gas-condenser composed of an outer and an inner cylinder, having an annular gas-space, *e*, between the two, and an open center air-chamber, *b*, through the inner one, and provided in the annular gas-space with ring-shaped friction-plates placed and supported as and for the purpose specified.

3. A gas-condenser composed of an outer and an inner cylinder, having an annular gas-space, *e*, between the two, and an open center air-chamber, *b*, through the inner one, and provided in the annular gas-space with friction-plates *h*, narrower than said space, extending horizontally, and from the walls to which they are attached inclining down to form a drip-edge, for the purpose specified.

4. In a gas-condenser, the combination of a column, *A*, having a plain annular gas-space, *e*, and an open center air-chamber, *b*, and provided at or near the top with an inlet-nozzle, *G*, leading to the said annular gas-space, a second column, *B*, having an annular gas-space and an open center air-chamber and provided in the annular gas-space with friction-plates *h*, attached alternately to both of the walls which form the said space, and a connection, *G'*, at the bottom between the annular space of the first and second column, for the purpose specified.

5. In a gas-condenser, the combination of a column having an annular gas-space and an open center air-chamber with a bottom ring, *f'*, filling the annular gas-space and sloping or inclining to one side, and a tar-pipe, *i*, connected with the said annular space at the lowermost part of the sloping bottom ring, for the purpose specified.

In testimony whereof we affix our signatures in presence of two witnesses.

ALEXANDER DELANEY.
WILLIAM SIMPKIN.

Witnesses:

AUGUSTINE W. BALL,
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