

(No Model.)

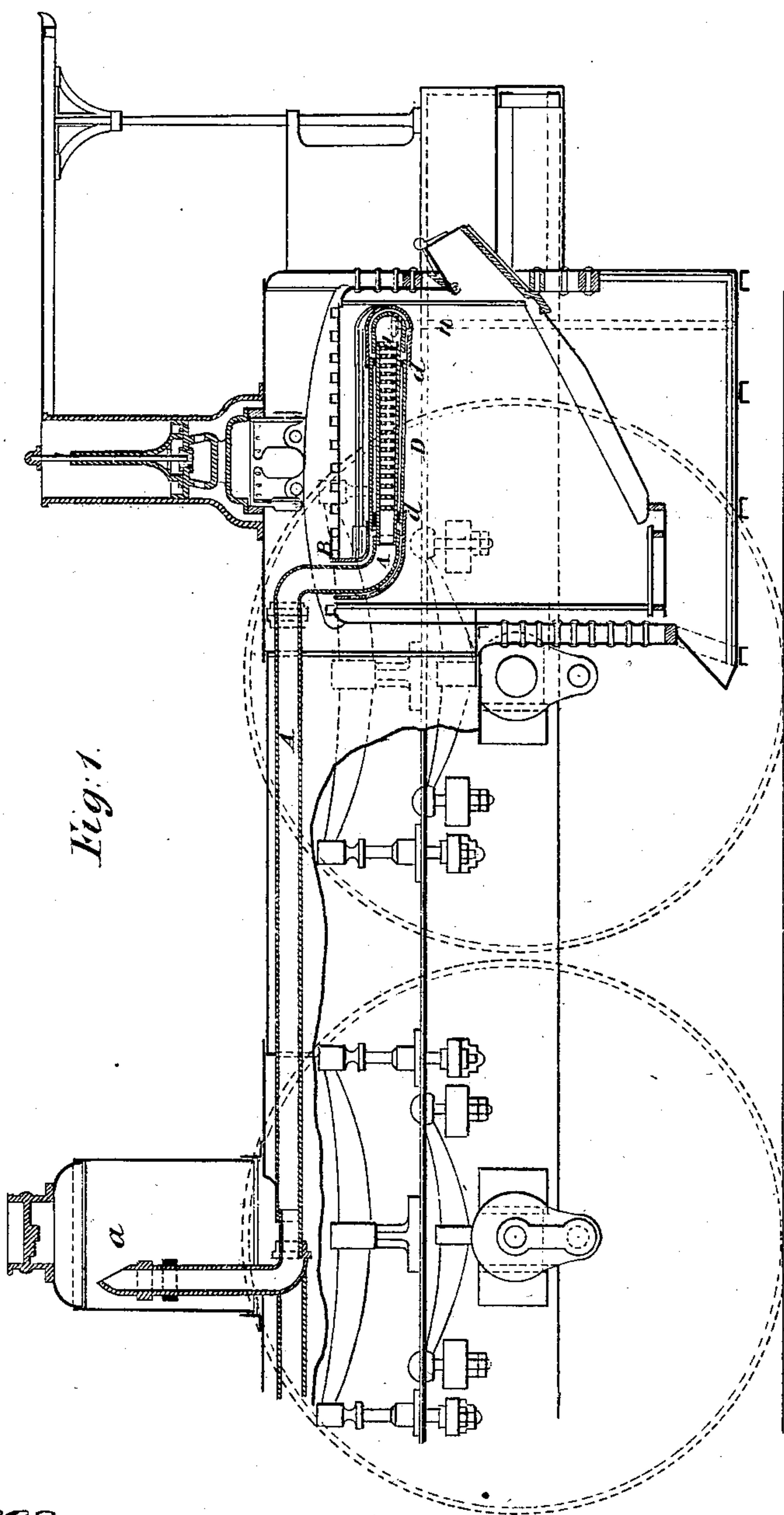
2 Sheets—Sheet 1.

A. ESTRADE.

APPARATUS FOR SUPERHEATING STEAM.

No. 254,628.

Patented Mar. 7, 1882.



Witnesses,

Albert H. Norris

Robert Everett

Inventor,

Auguste Estrade.

By James L. Norris.
Atty.

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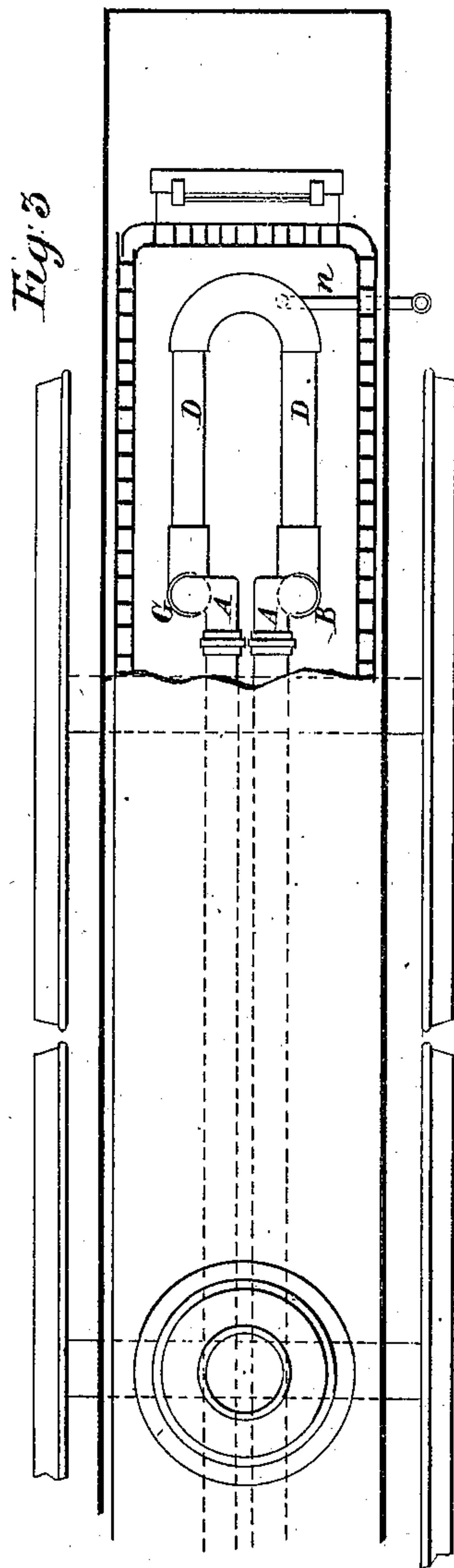
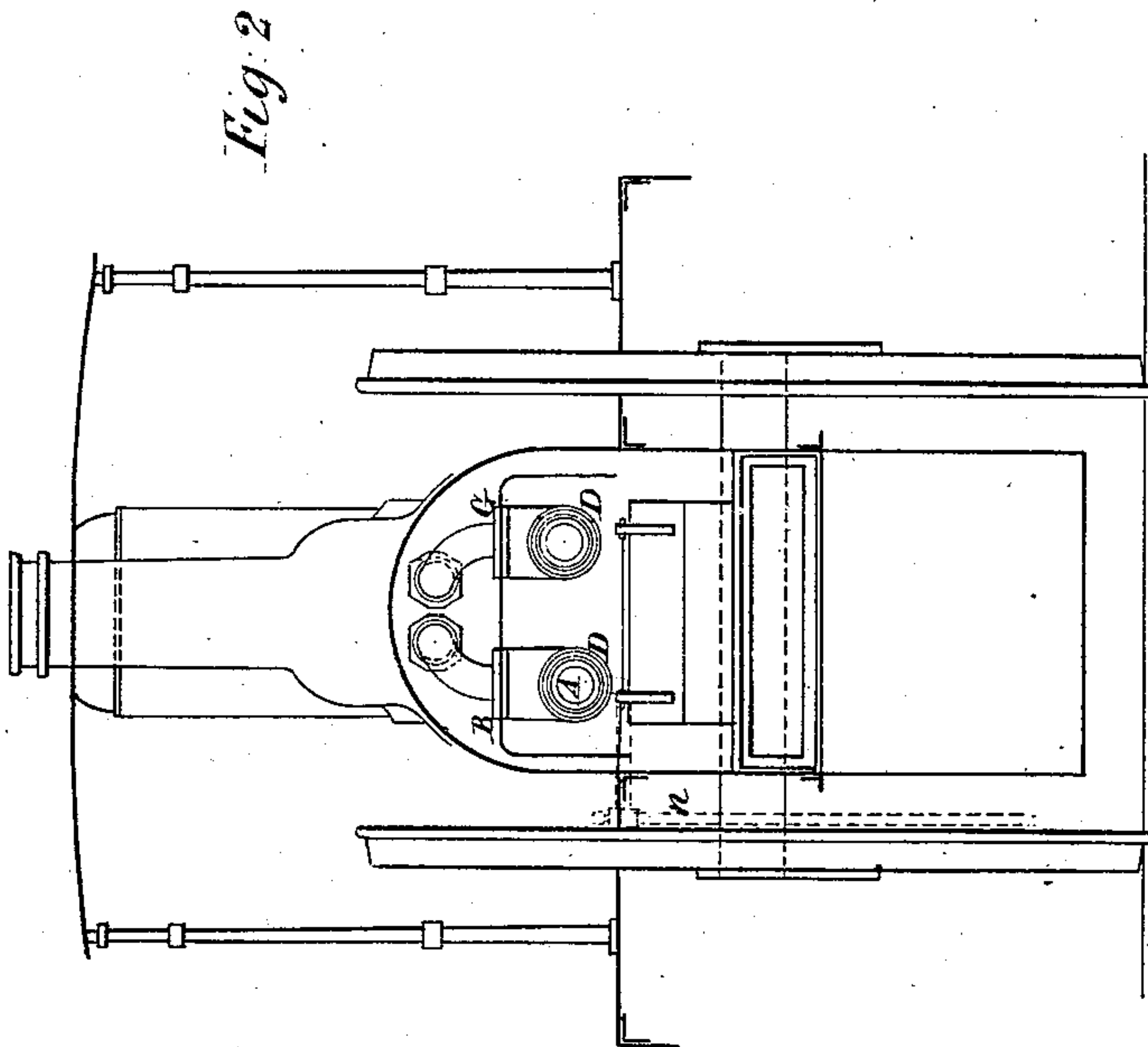
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UNITED STATES PATENT OFFICE.

AUGUSTE ESTRADE, OF PERPIGNAN, FRANCE.

APPARATUS FOR SUPERHEATING STEAM.

SPECIFICATION forming part of Letters Patent No. 254,628, dated March 7, 1882.

Application filed November 21, 1881. (No model.) Patented in France September 10, 1880, and in England September 28, 1881.

To all whom it may concern:

Be it known that I, AUGUSTE ESTRADE, a citizen of France, residing at Perpignan, in the Republic of France, have invented an Improved Apparatus for Superheating Steam, (for which I have obtained a patent in France, dated September 10, 1880, and in Great Britain, dated September 28, 1881, No. 4,178,) of which the following is a specification.

Steam is usually superheated by passing it through tubes exposed to the direct action of fire, which rapidly destroys the material of the tubes, rendering them useless.

This invention relates to means whereby the superheating-tubes are protected against the destructive action of the fire. For this purpose the tube or pipe through which the steam is passed to be superheated is inclosed within an outer pipe in which water of the boiler circulates, the two pipes being kept concentric with one another by studs. The steam-pipe has placed within it at intervals a number of metal gauze or perforated disks, which, by checking and breaking up such vesicular globules as may be carried along with the steam, insures the dryness of the steam. In the boiler of a locomotive or portable engine superheating apparatus of the kind described is conveniently applied in the following manner: The steam-pipe, having its mouth in the dome or highest part of the boiler, is carried forward along the interior of the boiler-crown to the fire-box, in the upper part of which it is bent round and backward and a little upward, the bent part within the fire-box being inclosed within the outer protecting-pipe, which communicates at both ends with the water in the boiler, and which should have connected to it a blow-off pipe to clear out sediment. In boilers of forms other than that employed for locomotive or portable engines the steam-pipe, with its water-casing, is arranged to suit the form and position of the furnace and flues.

The accompanying drawings show my above-described invention as applied to the boiler of a locomotive-engine.

Figure 1 shows a part longitudinal section of the engine. Fig. 2 shows a cross-section, and Fig. 3 shows a sectional plan.

A is the steam-pipe, having its inlet-opening *a* within the steam-dome. It passes down through the roof at B of the fire-box, within

which it is bent horizontal again, extending to the front, where it is bent back, and thence passes up through the roof again at G and is led along the boiler to the steam-cylinders.

Surrounding the steam-tube in the fire-box is a tube, D, of such a diameter as to leave a small annular space intervening between it and A all round. The tube is fixed to the crown of the fire-box, the holes of which, through which the steam-pipe A passes, being of the same diameter as the tube D, so that the water from the boiler can pass freely into the annular space of the latter through the annular openings round A. The opening into the tube D at B is below the water-level of the boiler, while that at G may advantageously be slightly higher than the other, and the tube itself also inclines upward from B to G, whereby a continuous circulation of the water through the tube in one and the same direction is established, facilitating the discharge therefrom of the particles of steam as they are generated therein. The steam-pipe is maintained in its central position within D by means of projections *d d*, formed on the interior of D. Within the steam-pipe are placed the disks of wire-gauze or perforated metal *a a*, held at equal distances apart therein by distance-pieces, while the end one is supported by a cross-piece fixed in the pipe.

The tube D is provided at its lowest point with a branch pipe, *n*, leading to the outside and provided with a cock, whereby any deposits within the tube may be discharged from time to time.

Having thus described the nature of my invention and in what manner the same is to be performed, I claim—

1. In a steam-superheater, the steam pipe passing through the roof of the fire-box, extended horizontally therein, and thence passing upward through the roof of said fire-box for connecting with the cylinders of the engine, in combination with a tube inclosing that part of the steam-pipe located within the fire-box to create an intervening water-space between the two, said tube having its ends secured in the roof of the fire-box and in communication with the water-space of the boiler, all substantially as shown, for the purpose described.

2. In a steam-superheater, the steam-pipe passing through the roof of the fire-box, extended horizontally therein, and thence passing up-

ward through the roof of said fire-box to connect with the cylinders of the engine, in combination with a series of wire-gauze or foraminous plates located within that part of the steam-pipe within the fire-box, and a tube inclosing said steam-pipe and having its ends secured within the roof of the fire-box, all substantially as shown, and for the purposes described.

10 3. In a steam-generator, the steam-pipe extended into the fire-box, in combination with a series of wire-gauze or perforated disks ar-

ranged transversely within said extended part of the steam-pipe, and a water-jacket or tube surrounding the latter, substantially as and for 15 the purpose described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 2d day of November, A. D. 1881.

AUGUSTE ESTRADE.

Witnesses:

JULES DUPONT,
JULES DIGEON.