A. B. Latta,

Steam-Boiler Water-Tube.

No. 18,460. Patented Oct. 20, 1857.

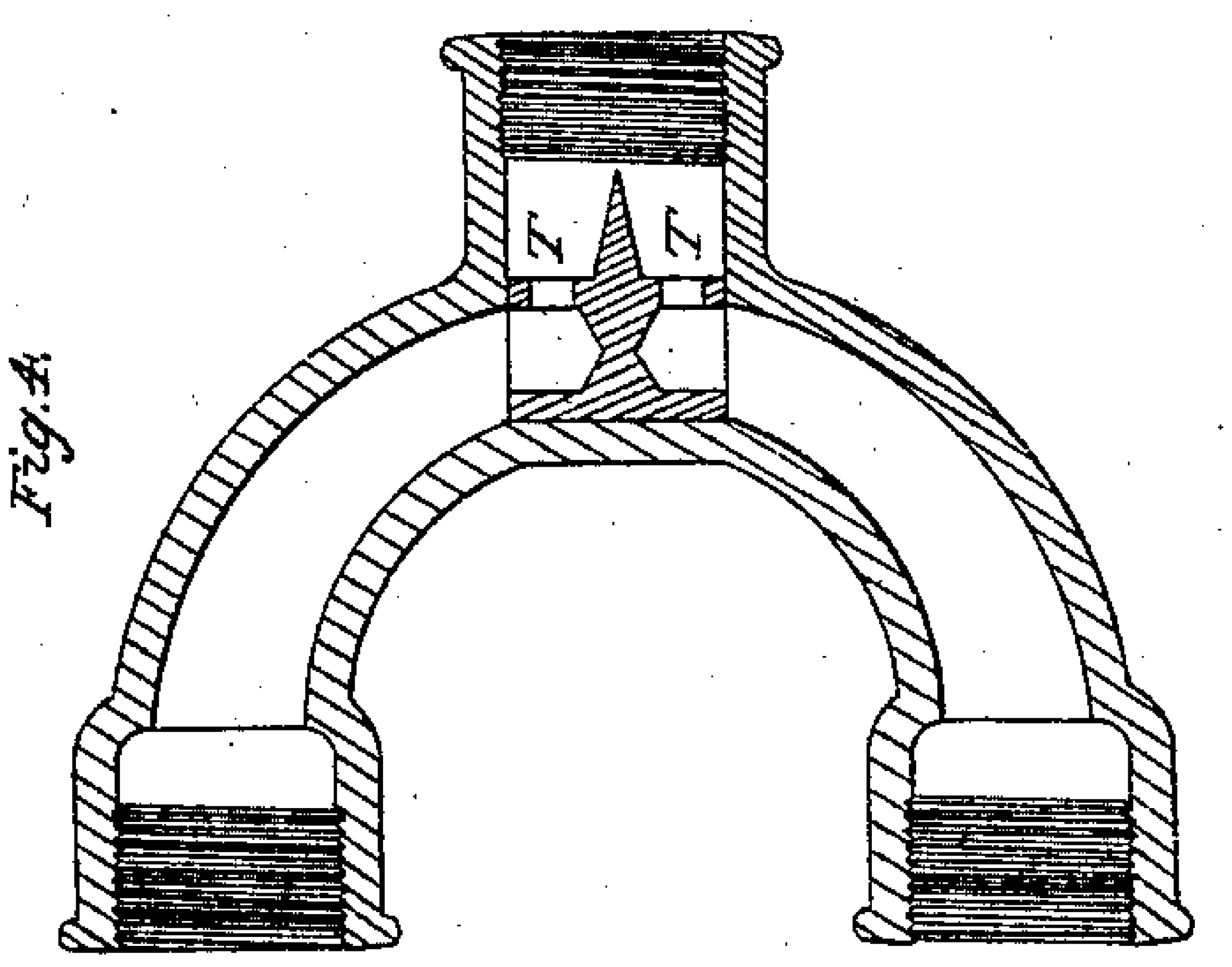

Fig. 4.

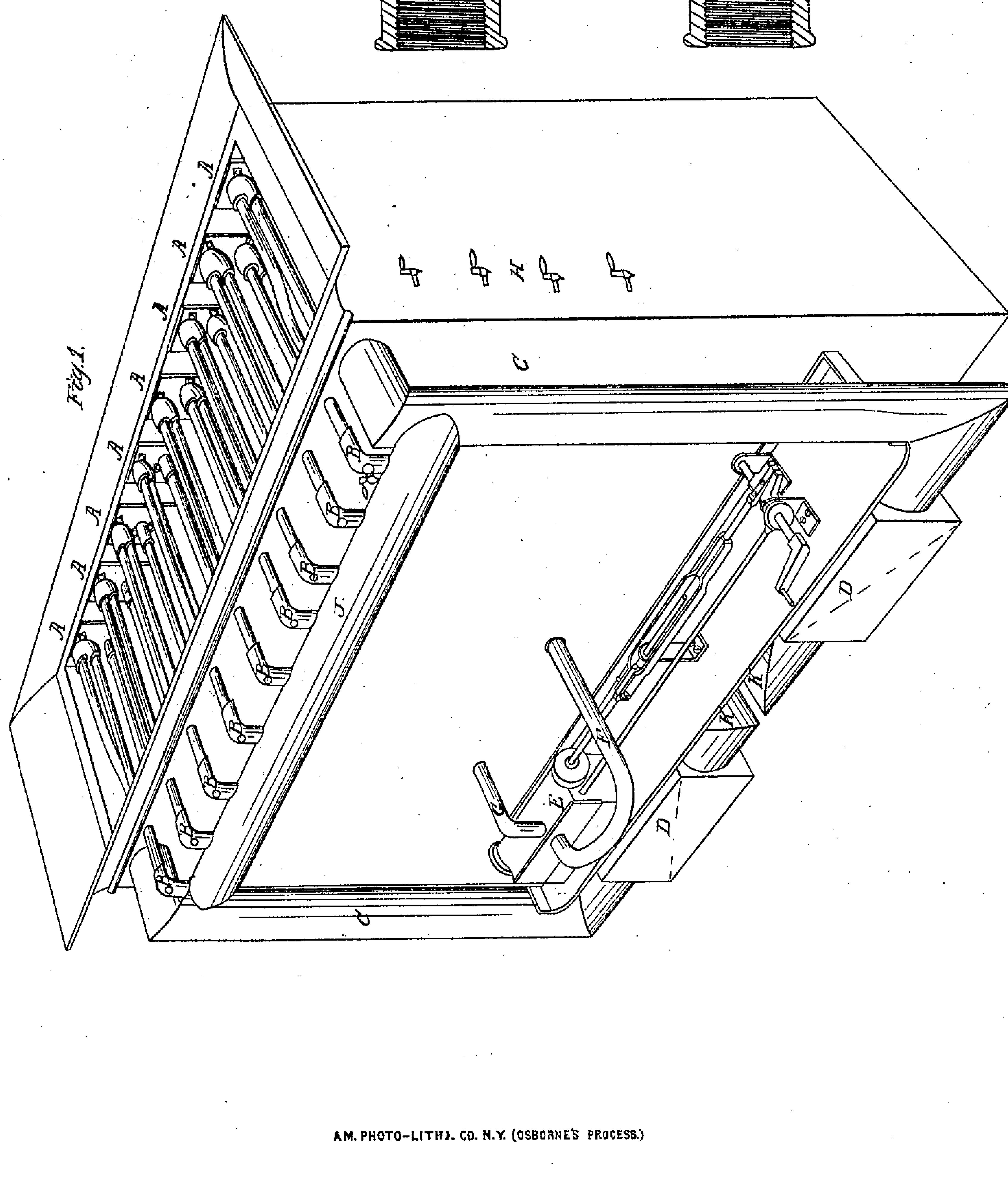

Fig. 1.

2 Sheets. Sheet 2.

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Fig. 2.

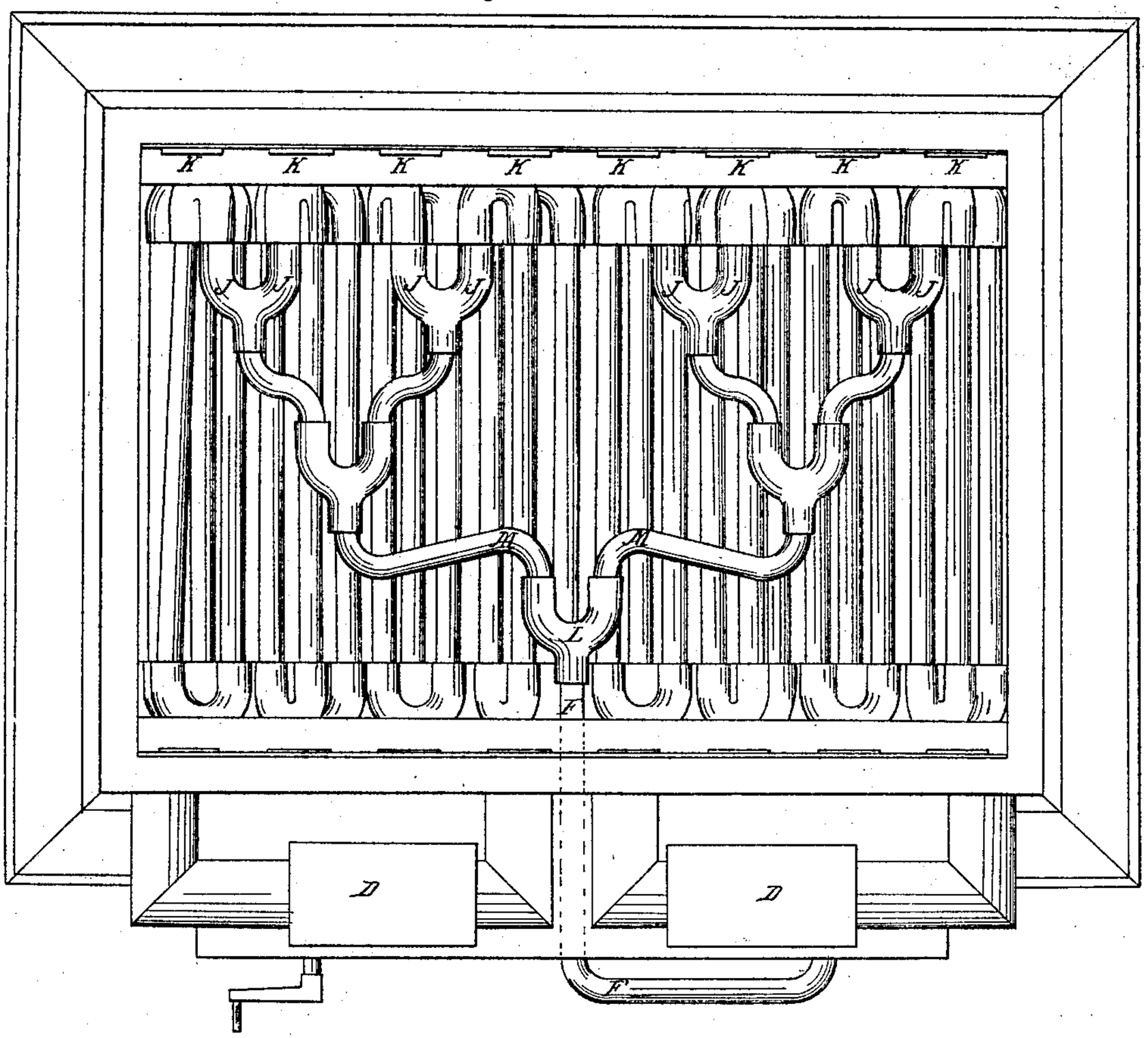
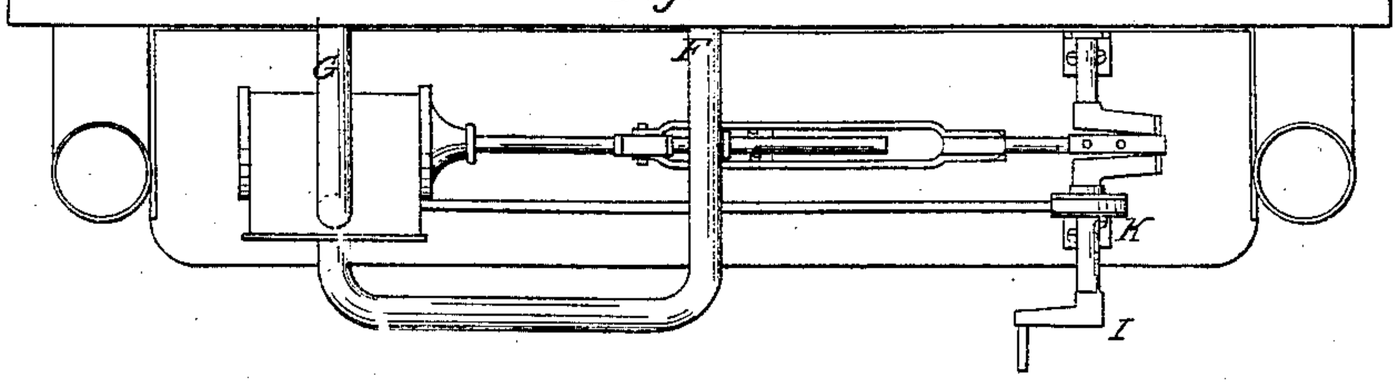


Fig. 3.



UNITED STATES PATENT OFFICE.

ALEXANDER B. LATTA, OF CINCINNATI, OHIO.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. **18,460**, dated October 20, 1857.

To all whom it may concern:

Be it known that I, ALEXANDER B. LATTA, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement which I denominate a Circulating Tubular Sectional Steam-Generator, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

In Plate 1, Figure 1 is a perspective view of the boiler when finished, with the cover removed in order to see the coil, which is in sections, secured to plates under A A A A A A A A A. These plates are secured to the fire-box or water-jacket that surrounds this coil all the way round from top to bottom. The water and steam spaces are of the same size. This water-jacket is made of boiler-plate, stay-bolted as usual in all flat surfaces of boilers. The water is carried up to the water-line at H between the two middle cocks. The connections from each section of coil come through the fire-box by having a tube inserted tight in the inside and outside sheet of sufficient size to let the coil pass through it freely and enter the turns B B B B B B B B B, which enter the cross-pipe J, which connects with the pipes C C, the upper ends of which enter the steam chamber or jacket, in order to conduct the steam back into the upper part of the jacket, while the lower ends pass down and connect with the strainer-box D D, in which is a perforated plate or wire-gauze placed diagonally, so as to compel the water to pass through it. It then connects with the water-jacket at K K, returns all the water the coil throws over that is not converted into steam back into the water-jacket. These strainer-boxes may be provided with valves on either side when long runs are required, so that by shutting the valves on each side the cover of the strainer-box may be removed, and the dirt, sand, &c., cleaned out without stopping the boiler. The small holes in the front of turns B B B B B B B B B are to insert gage-cocks to try when the water is sufficiently circulated. The small engine E is to take its water out of the water-jacket by means of pipe G, which enters the exhaust-port of cylinder. We call this "anengine" because it is made precisely like a steam-engine, although in this case it is used as a pump to circulate the water from the fire-box through the coil. It receives its water through the exhaust-pipes and forces it out through the steam-ports through the pipe F, which connects with the coil at the divider hereinafter described. The eccentric that works the slide-valve is set the reverse of the steam-engine. This pump is provided with a crank by which it must be turned by hand while raising steam, in order to circulate the water. This pump must be so arranged as to work by a small steam-engine or the large engine to which the boiler is attached. A small engine is the most convenient, as it can be varied in speed to give any desired quantity of water. It must be so arranged as to disconnect from the engine that drives it in order to turn it by hand while raising steam. It requires very little power to drive it, as it only has the difference of the pressure in the fire-box and that of the coil to contend with, which is light. It is absolutely necessary to have the valves of this pump to work positive with the movement of the pump, because the pump works boiling-hot water and steam together, and if valves are to depend on their own gravity it would not work at all times, which is ruinous to this boiler. For that reason I use a slide-valve and move it with the eccentric. This makes a sure supply of water at all times. The cover on the top of Fig. 1 has an aperture to receive the chimney to carry all the smoke, &c., off.

In Plate 2, Fig. 2, we have a view of the bottom of the boilers, with the grate-bars removed, in order to see the coil and manner of attaching the dividing, &c. K K K K K K K K represents the lines on the end to which the coil is attached coming down through a mortise in a bar of angle-iron secured to the inside of fire-box. F F is the pipe coming from the pump through the fire-box by means of a tube therein, but having no connection therewith; then connecting with the first dividing-piece L; then passes through the pipes M M into the second dividers, and then into the four dividers J J J J, which enters each section of the coil. A section of this divider may be seen in Plate 1, Fig. 4. It will be seen that the water is first divided by the splitter, then enters the small hole on either side T T. It then discharges itself into

the ends in each section of the coil. The object of reducing the opening at T T is to increase the pressure between the opening T T and the pumps, to overcome any unequal pressure caused by the irregularity of the fire, thereby insuring at all times a due proportion of water to each section of coil. Fig. 4 is full size, as is used in the common boiler.

Fig. 3 is merely a plan of the pump removed from its place in order to see it more distinctly. It is immaterial whether this pump is attached to the side of the boiler or not. It can be located anywhere near it. The one I now have in use, which has worked so successfully for some time, stands out by itself.

The object of this boiler is to render a coiled boiler, which has heretofore been attended with more difficulty in watching the supply of water more closely than common boilers. By this arrangement this difficulty is overcome, as it is only necessary to know that the circulating-pump is going, and no further attention is required. The supply-water is pumped into the water-jacket by the force-pump of the engine in the same way as supplying any other boiler, and regulated by the gage-cocks in the fire-box. This, however, has nothing to do with the circulating-pump. It must work constantly and independently of anything else. In case of any accident to this pump which would prevent its working, the fires must be put out at once or so reduced as to prevent burning the coil.

What I claim as new, and desire to secure by Letters Patent, is—

The application of the pump E to a coiled boiler, in combination with the pipes C and strainers D, the whole being arranged and operated in the manner substantially as described, for the purpose of causing the water to circulate through the coils from the lower part of the water-jacket, and of separating the steam generated in the coils from the water and then conducting it into the steam-chamber or upper part of the water-jacket, and of returning the water unconverted into steam back into the lower part of the water-jacket, as set forth.

A. B. LATTA.

Attest:
W. H. THOMPSON,
W. CHEDSEY.