

(No Model.)

E. ROWE.
STEAM CONDENSER AND AERATOR.

No. 554,539.

Patented Feb. 11, 1896.

Fig: 1.

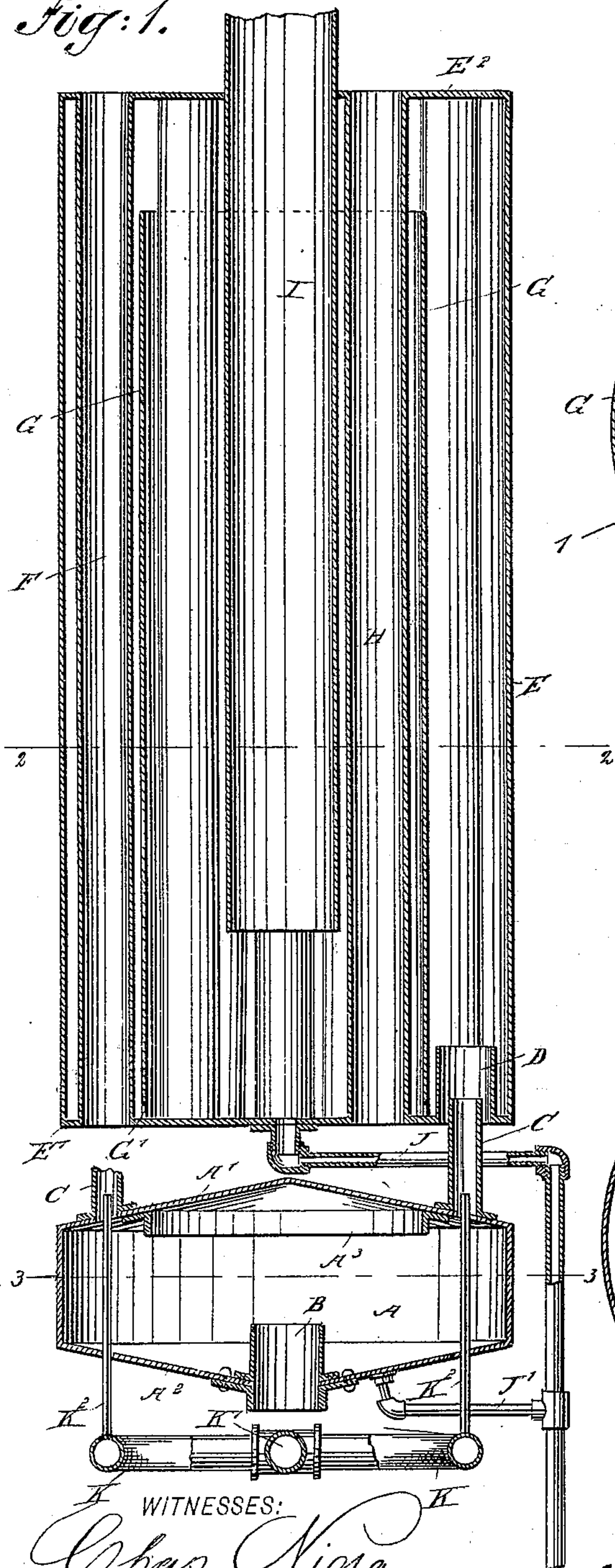


Fig: 2.

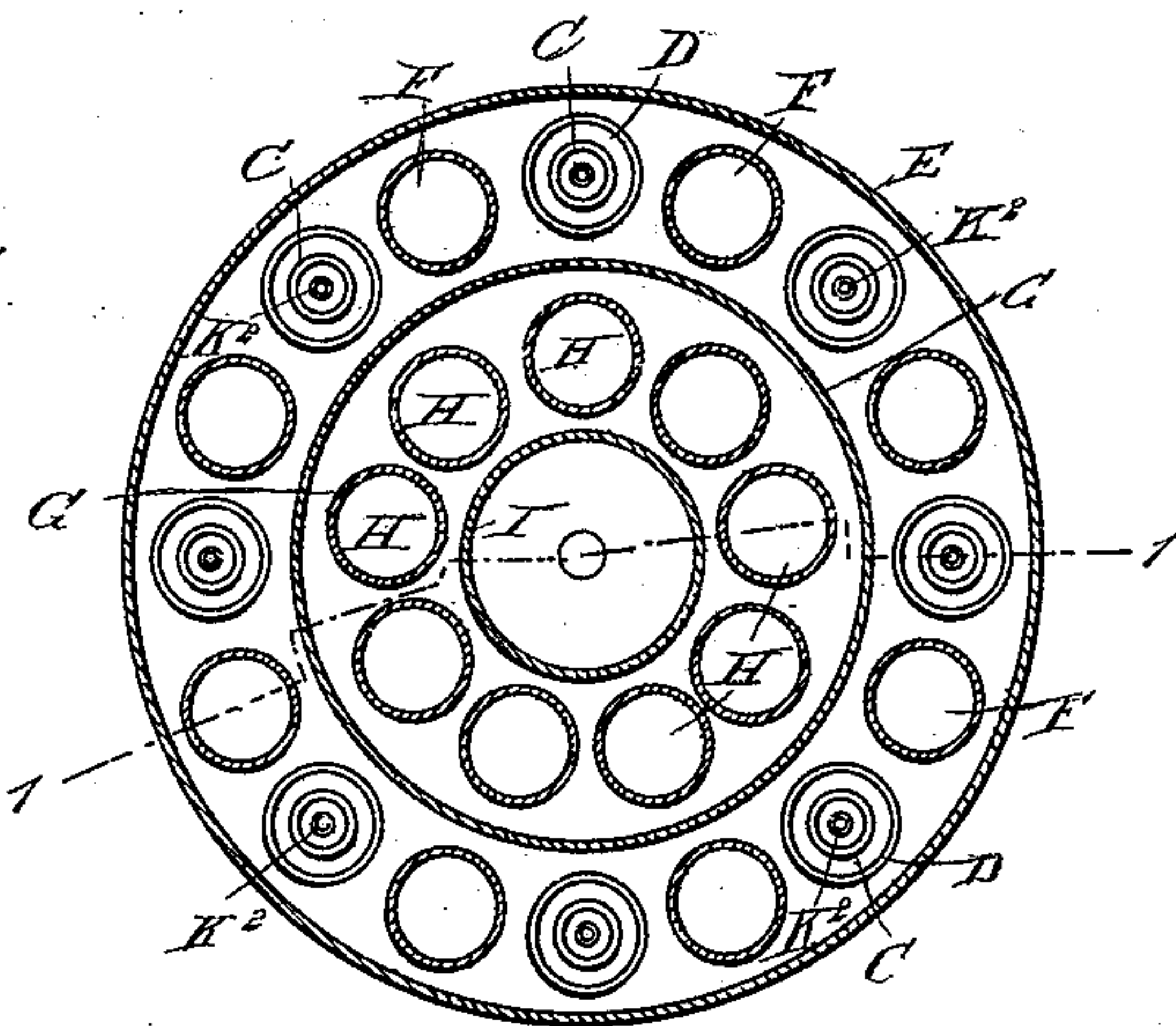


Fig: 3.

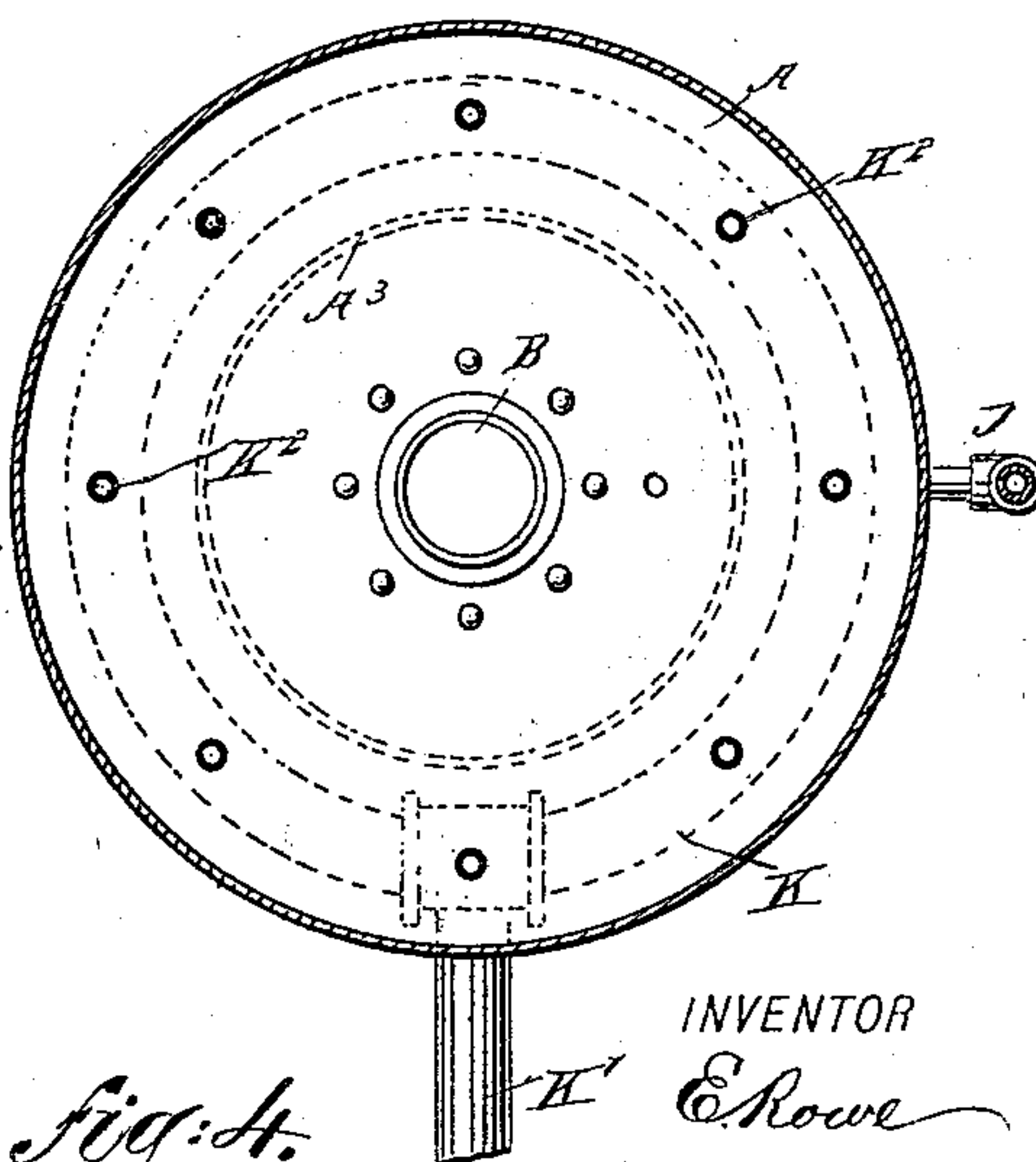


Fig: 4.



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EDWARD ROWE, OF INDIANA, PENNSYLVANIA.

STEAM CONDENSER AND AERATOR.

SPECIFICATION forming part of Letters Patent No. 554,539, dated February 11, 1896.

Application filed May 25, 1895. Serial No. 550,630. (No model.)

To all whom it may concern:

Be it known that I, EDWARD ROWE, of Indiana, in the county of Indiana and State of Pennsylvania, have invented a new and Improved Steam Condenser and Aerator, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved steam condenser and aerator which is simple and durable in construction, arranged to insure a quick condensation of the steam from an engine, and to relieve the latter of back-pressure, and also prevent water from the engine running back into the exhaust-pipe, and to aerate the water of condensation, so as to make it better for use in boilers.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement on the line 1 1 of Fig. 2. Fig. 2 is a sectional plan view of the same on the line 2 2 of Fig. 1. Fig. 3 is a sectional plan view of the distributor on the line 3 3 of Fig. 1; and Fig. 4 is a side elevation of the lower end of the baffle-plate.

The improved condenser and aerator is provided with a steam-distributor A, provided with a conical top A' and a correspondingly-shaped but inverted bottom A², into which extends a pipe B connected with the exhaust of the engine, the said pipe B extending a short distance above the bottom A², as plainly indicated in Fig. 1. From the conical top A' of the distributor A lead a series of short nozzles C extending into the short inlet-pipes D, held in the lower head, E', of a shell E, closed at its upper end by a head E².

It will be seen that exhaust-steam passing from the exhaust-pipe through the pipe B into the distributor A passes from the latter through the several nozzles C upward and through the inlets D into the shell E, thereby causing air to be drawn into the inlets D from the outside and on the under side of the shell,

so that air thus drawn into the shell E is mingled with the steam, and consequently a rapid condensation of the steam takes place within the shell without danger of back-pressure to the engine.

In the shell E are arranged a series of air-pipes F, leading from one head E' to the other head E² and arranged alternately with the air-inlet pipes D. (See Fig. 2.) The pipes F, together with the pipes D, are preferably arranged in a circle, and inside of the said pipes is located a baffle-plate G, made circular and set at its lower end on the head E', to extend at its upper end within a short distance of the top of the head E². The lower end of this baffle-plate G is formed with notches or openings G', so that any water of condensation in the water-pipes of the shell can pass through the said openings to the center of the head E'.

A second set of air-pipes H, and held in the heads E' and E², is arranged within the baffle-plate G, and within this set of air-pipes extends a stack I, attached to the top head, E², and extending with its lower end a suitable distance from the lower head, E', as plainly indicated in Fig. 1. The stack I reaches upward and outward a suitable distance beyond the upper end of the head E², so that the steam not condensed can pass through the said stack I to the outside.

In the lower head, E', and at or near the center thereof, is arranged a drain-pipe J for carrying off the water of condensation, the drain-pipe J being connected by a branch pipe J' with the bottom A² of the distributor A, so as to carry off any water of condensation that may accumulate in the said distributor.

A circular pipe K provided with an inlet-pipe K' and connected with a suitable source of air supply—such, for instance, as a pressure blower or pump—is located under the distributor A, and is provided with a series of nozzles K², which extend through the bottom A² of the distributor, through the said distributor and a short distance into the nozzles C, as plainly indicated in Fig. 1. By this arrangement air under pressure may be forced through the nozzles C, so as to insure a ready outflow of the exhaust-steam from the distributor A through the nozzles C.

It will be seen that by forcing compressed

air through the nozzles C by the nozzles K² the exhaust-steam in the distributor is forcibly ejected through the said nozzles C and inlet-pipes D into the shell. This action tends
 5 to cause a vacuum in the distributor and consequently in the exhaust-pipe and engine-cylinder, thus relieving the engine of all back-pressure and permitting it to work with greater power. Now it will be seen that by
 10 the arrangement described the steam passing from the engine to the distributor A passes from the latter through the nozzles C in the shell E, to be there mixed or mingled with air drawn in by the steam through the inlet-
 15 pipes D. Thus the steam is rapidly condensed, and the condensation is aided by the mingled steam and air coming in contact with the pipes F and H, through which circulates atmospheric air. Thus it will be seen that
 20 the mingled steam and air first pass upward in the outer part of the shell E, owing to the baffle-plate G, the steam and air then passing from the upper end of the shell downward and within the baffle-plate G and pipes H to
 25 finally permit the steam not condensed and air to pass into and out of the stack I.

On the under side of the top A' of the distributor A is arranged an annular flange A³, so that any water of condensation which is
 30 thrown up by the engine through the pipe B is caused to flow down the said flange and drop upon the bottom A² without danger of the said water being carried by the exhaust-steam through the nozzles C.

35 Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A steam condenser and aerator, comprising a shell provided with air-inlets, steam-
 40 nozzles extending from a steam-distributor into the said air-inlets, to cause the exhaust-steam passing through the nozzles and air-inlets to draw in the air through the inlets, to insure a mingling of the air and steam within
 45 the said shell, and nozzles connected with a compressed-air supply and extending into the said steam-nozzles, substantially as shown and described.

2. A steam condenser and aerator, comprising a shell formed with a series of short air-
 50 inlets in its lower head, a steam-distributor connected with a steam-exhaust, a series of steam-nozzles extending from the said distributor into the said air-inlets, and a stack
 55 extending into the said shell, substantially as shown and described.

3. A steam condenser and aerator, compris-

ing a shell formed with a series of short air-inlets in its lower head, a steam-distributor connected with a steam-exhaust, a series of
 60 steam-nozzles extending from the said distributor into the said air-inlets, and a baffle-plate arranged within the said shell and inside of the said air-inlets, the said baffle-plate
 65 extending from the lower head of the shell to within a short distance of the top thereof, substantially as shown and described.

4. A steam condenser and aerator, comprising a shell formed with a series of short air-
 70 inlets in its lower head, a steam-distributor connected with a steam-exhaust, a series of steam-nozzles extending from the said distributor into the said air-inlets, a baffle-plate
 75 arranged within the said shell and inside of the said air-inlets, the said baffle-plate extending from the lower head of the shell to within a short distance of the top thereof, a
 80 stack extending into the shell from above and terminating at its lower end a short distance from the lower head of the shell, substantially as shown and described.

5. A steam condenser and aerator, comprising a shell formed with a series of short air-
 85 inlets in its lower head, a steam-distributor connected with a steam-exhaust, a series of steam-nozzles extending from the said distributor into the said air-inlets, a baffle-plate
 90 arranged within the said shell and inside of the said air-inlets, the said baffle-plate extending from the lower head of the shell to within a short distance of the top thereof,
 95 and a water-drain pipe leading from the lower head of the said shell, substantially as shown and described.

6. A steam condenser and aerator, comprising a shell formed with a series of short air-
 95 inlets in its lower head, a steam-distributor connected with a steam-exhaust, a series of steam-nozzles extending from the said distributor into the said air-inlets, a baffle-plate
 100 arranged within the said shell and inside of the said air-inlets, the said baffle-plate extending from the lower head of the shell to within a short distance of the top thereof, a
 105 water-drain pipe leading from the lower head of the said shell, and a branch pipe leading from the said drain-pipe into the said distributor, substantially as shown and described.

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Witnesses:

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