

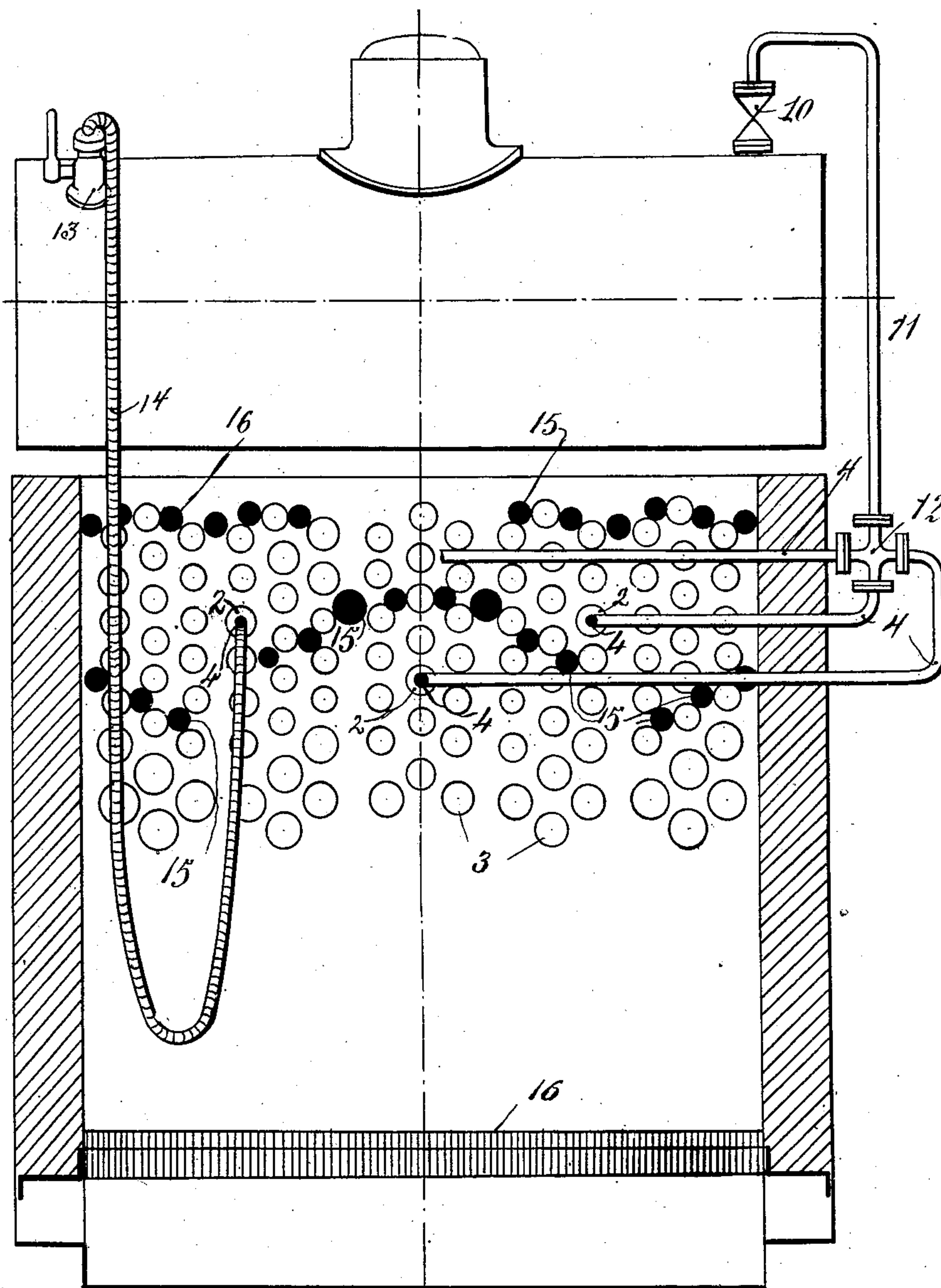
No. 863,628.

PATENTED AUG. 20, 1907.

J. & A. NICLAUSSE.
BOILER TUBE CLEANER.
APPLICATION FILED MAY 20, 1905.

3 SHEETS—SHEET 1.

Fig 1



Witnesses
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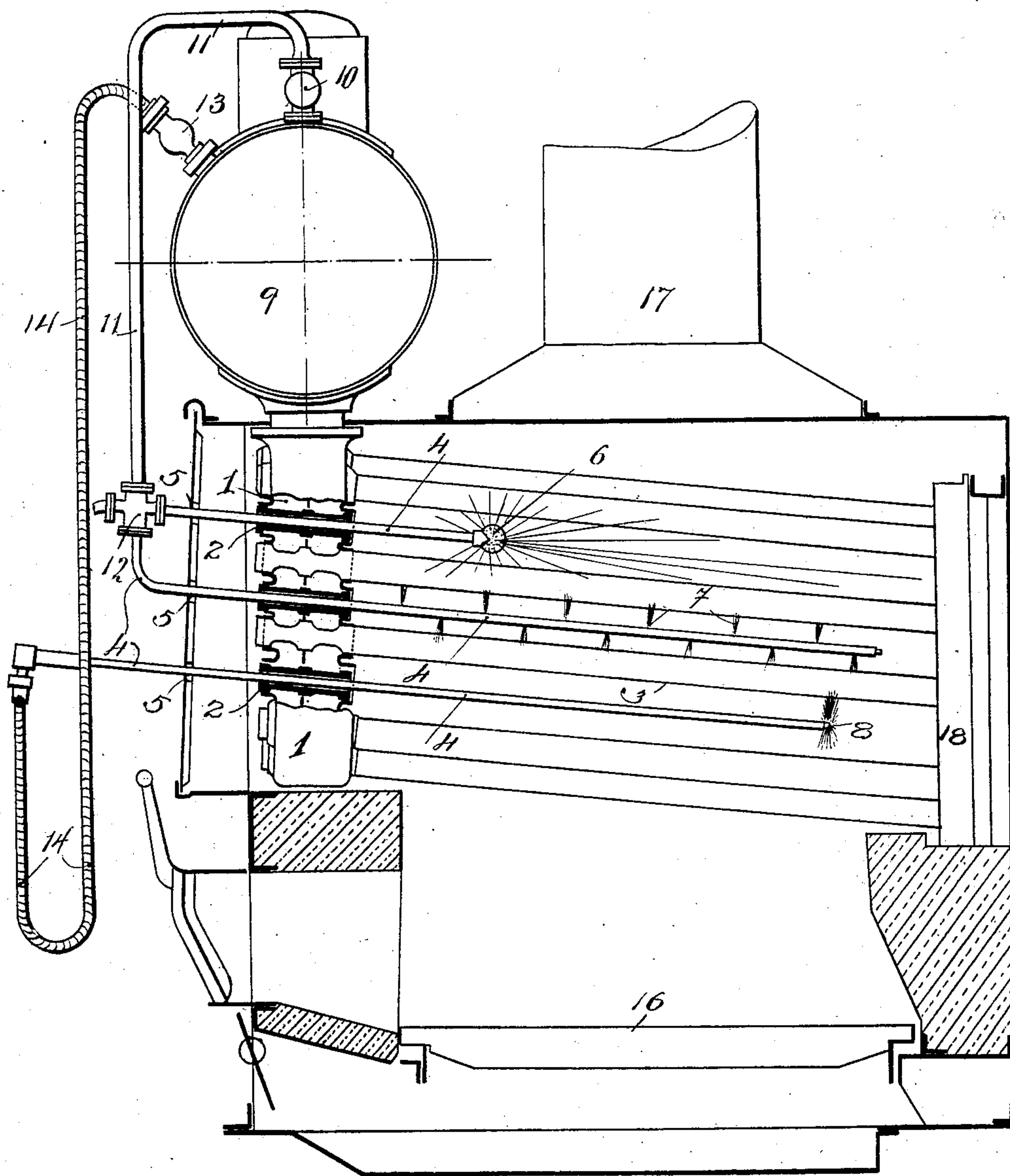
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3 SHEETS—SHEET 2.

Fig. 2.



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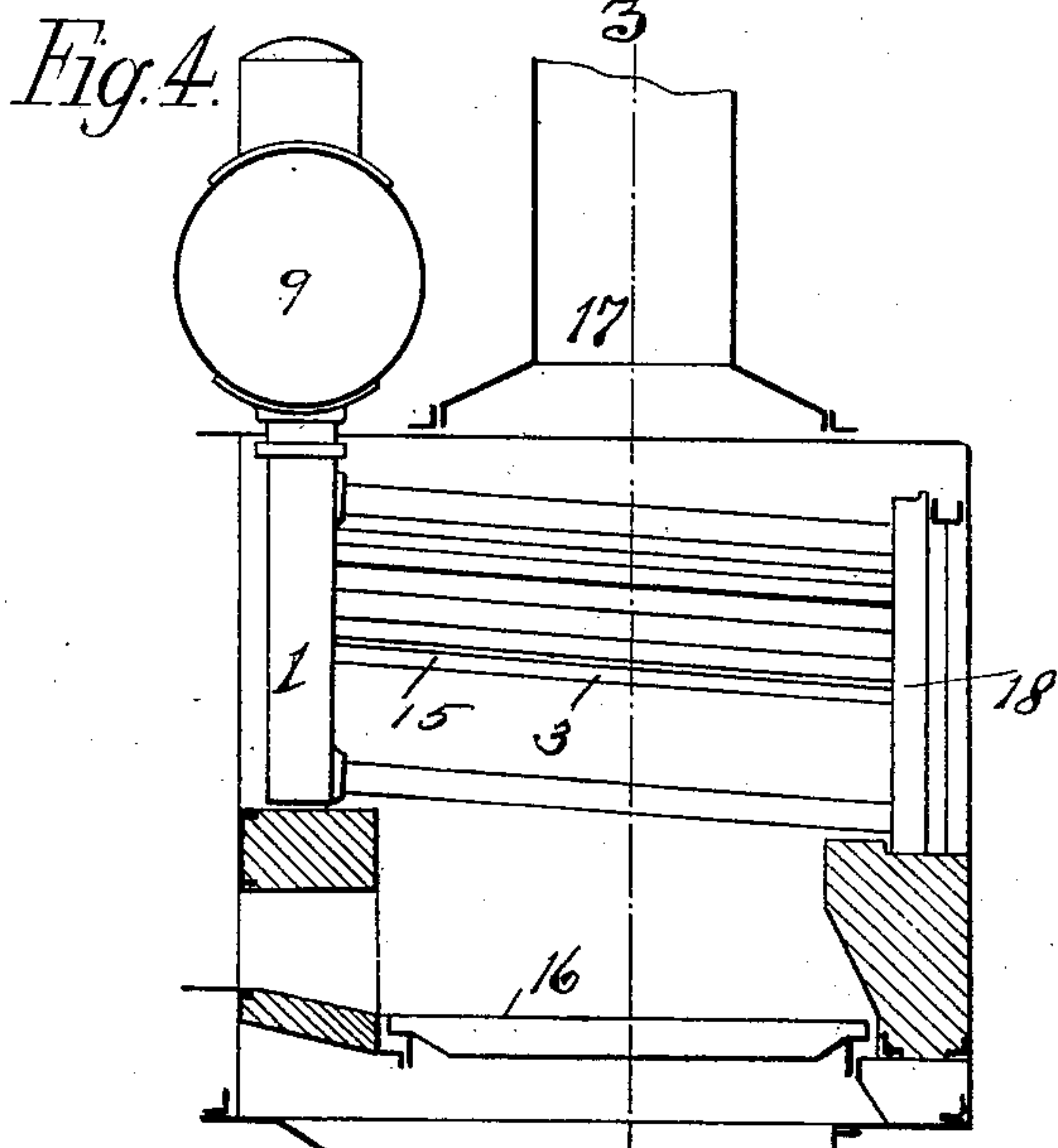
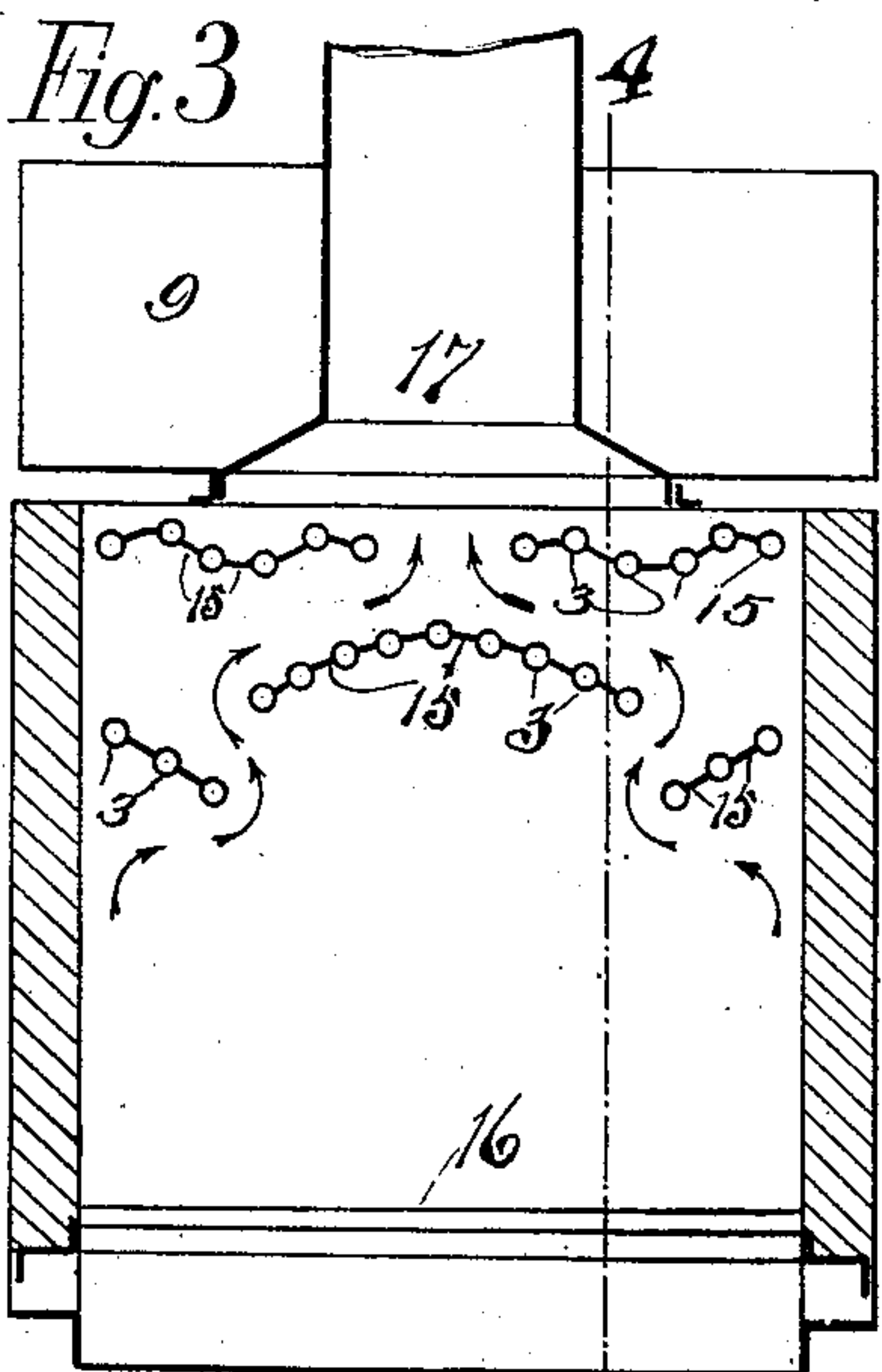
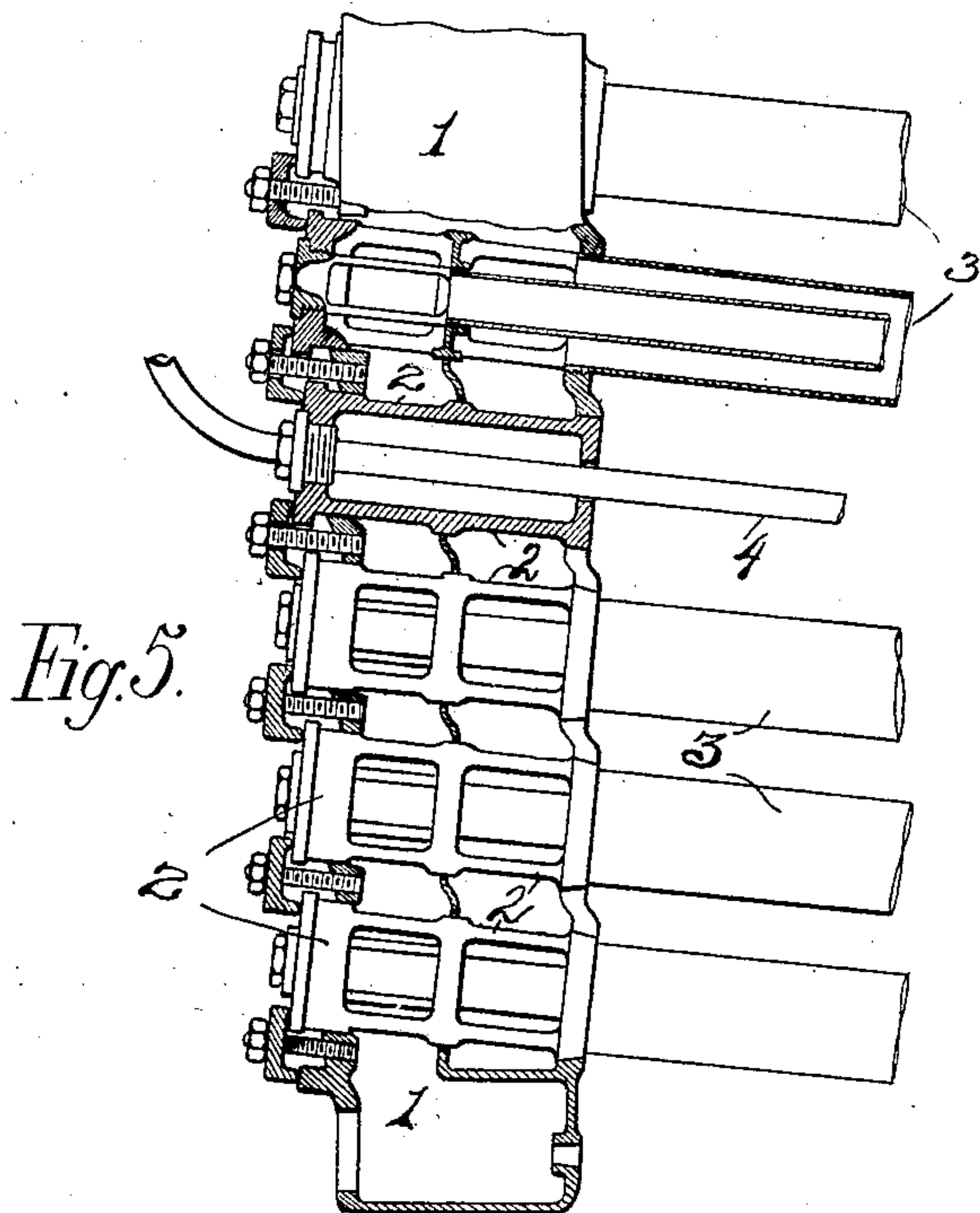
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

JULES NICLAUSSE AND ALBERT NICLAUSSE, OF PARIS, FRANCE.

BOILER-TUBE CLEANER.

No. 863,628.

Specification of Letters Patent.

Patented Aug. 20, 1907.

Application filed May 20, 1905, Serial No. 261,432.

To all whom it may concern:

Be it known that we, JULES NICLAUSSE and ALBERT NICLAUSSE, citizens of the Republic of France, residing at 24 Rue des Ardennes, Paris, France, have invented a new and useful Improvement in Boiler-Tube Cleaners, which improvement is fully set forth in the following specification.

This invention relates to boiler tube cleaners and has for its object the provision of means for cleaning the outside of the tubes in a multitubular steam generator without interrupting the function of said generator for steaming purposes. The invention looks to the employment in this connection of a jet of liquid, compressed air, or steam drawn from the boiler fed by such generator, or from other suitable source.

Having this object in view, openings are provided in the front of the generators wherein movable or preferably fixed pipes are introduced longitudinally of the tubes and interspersed therewith and by means of such pipes jets of fluid under pressure are caused to act upon the outside of the tubes. With this arrangement, a cleaning of the tubes can be effected very advantageously without interrupting the use of the boiler.

The invention is best carried out in boilers wherein the collector head is connected by tubular ties serving to receive the ends of the tubes. Here the cleaning pipes are mounted in the hollow ties interchangeably with the heating tubes, whereby it is rendered possible to change the location of the cleaning pipes relative to the tubes and to increase or diminish their number, as occasion may require. It is, of course, desirable that no more heating pipes be employed than is necessary, as the substitution of a heating tube by a cleaning pipe to that extent decreases the heating surface; on the other hand, the number of cleaning pipes must be sufficient and their arrangement such that every portion of the heating surface of the tubes shall be within the sphere of action of the pipes. The number of heating pipes and their arrangement relative to the tubes will vary with the arrangement of the tubes in the boiler.

In order to utilize the invention to the greatest advantage, it is important to employ baffles extending longitudinally of the tubes instead of at angles thereto, as by such construction the entrance of the cleaning pipes may be confined to the front of the boiler and their number reduced over what would otherwise be necessary to effect a thorough cleaning.

The invention, as hereinafter more fully described and as particularly set out in the claims, will be readily understood from the accompanying drawings, in which is shown a preferred embodiment of the invention with modifications.

In these drawings Figure 1 is a front view showing on the right an arrangement of fixed cleaning pipes, and on the left a movable cleaning pipe; Fig. 2 is a longitudinal section also showing fixed and movable cleaning

pipes; Fig. 3 is a diagrammatic section on the line 3—3 of Fig. 4, showing the arrangement of baffle plates relative to the tubes and the course of the heated gases to the flue; Fig. 4 is a sectional view on the line 4—4 of Fig. 3; and Fig. 5 is a section through the collector head on a large scale, illustrating the interchangeable feature of the cleaning pipes and heating tubes.

The collector head 1 of the boiler is provided with hollow ties 2, which serve to receive the skeleton ends of the heating tubes 3, and cleaning pipes 4. In the former case the heating tubes communicate with the interior of the collector head through lateral openings, while in the latter case the cleaning pipes extend outward through the ends of the hollow ties and through openings 5 in the inspection door. These cleaning pipes may be movable as shown in the left hand side of Fig. 1 and the lower part of Fig. 2, or they may be fixed in permanent relation to the heating tubes as shown in the right hand side of Fig. 1 and the upper portion of Fig. 2. The cleaning pipes are provided with suitable perforations for directing jets of steam, compressed air, or other fluid upon the outer surfaces of the tubes. They may be provided with a perforated globular end 6, with a series of perforations 7 extending longitudinally of the pipes, or, in case of the movable pipes, with a rose 8.

In the case of fixed cleaning pipes the medium used is steam taken from the boiler 9 by way of the valve 10 and the pipe 11, connecting with the ends of the cleaning pipes by means of the union 12; and the movable cleaning pipes, where employed, may take steam from the boiler 9 through the valve 13 and the flexible pipe 14, connected with the outer end of the movable cleaning pipe.

While we have shown both movable and fixed pipes used together, ordinarily but one sort would be employed. Usually the fixed pipes are preferable as the movable pipes require more space in front of the boiler for their manipulation. Where fixed pipes are employed they are so interspersed among the heating tubes as that a minimum number of cleaning pipes will bear upon a maximum number of tubes.

The required number of cleaning pipes is materially reduced by a judicious employment of baffle plates. These plates have for their primary object the usual function of lengthening the path of the heated gases and bringing them into contact with the tubes to good advantage, so as to give up their heat thereto. For the purposes of this invention, it has been found most advantageous to form such baffle plates by arranging refractory bars 15 longitudinally of and between the parallel heating tubes so that the tubes and bars together form a substantially horizontal plate extending longitudinally. The several baffle plates thus formed are arranged in staggered relation to each other so as to intercept and direct the hot gases in a circuitous

path from the grate 16 to the flue 17, as indicated in Fig. 3. The refractory bars 15 should extend substantially throughout the furnace and may be attached in any suitable manner to the front collector head 1 and to the rear tube plate 18. By this arrangement cleaning pipes entering at the front of the boiler through the collector head suffice to reach all of the tubes and may be disposed to the best advantage with that object in view.

10 Having thus fully described the invention, what we claim as new and desire to secure by Letters Patent of the United States, is:

1. In an arrangement for cleaning boiler tubes, the combination, with interspersed heating tubes and perforated cleaning pipes arranged in parallel series, of a collector head provided with hollow ties arranged to interchangeably receive the tubes and pipes, the tubes communicating with the interior of the collector head and the pipes with a source of fluid under pressure.

2. In an arrangement for cleaning boiler tubes, the combination, with interspersed heating tubes and perforated cleaning pipes arranged in parallel horizontal series, of a collector head provided with hollow ties arranged to interchangeably receive the tubes and pipes, the tubes communicating with the interior of the collector head and the pipes with the steam space of the boiler.

3. In an arrangement for cleaning boiler tubes, the combination, with heating tubes arranged in parallel horizontal series, baffle plates extending longitudinally of and between the tubes, and perforated cleaning pipes interspersed between and extending longitudinally of the tubes

and baffle plates, of a collector head provided with hollow ties arranged to interchangeably receive the tubes and pipes, the tubes communicating with the interior of the collector head and the pipes with the steam space of the boiler.

4. In an arrangement for cleaning boiler tubes, the combination, with heating tubes arranged in parallel horizontal series, refractory bars extending longitudinally of and between adjacent tubes in substantially the same horizontal plane to form baffle plates, and perforated cleaning pipes interspersed between the tubes and baffle plates thus formed, of a collector head provided with hollow ties arranged to interchangeably receive the tubes and pipes, the tubes communicating with the interior of the collector head and the pipes with the steam space of the boiler.

5. In an arrangement for cleaning boiler tubes, the combination, with heating tubes arranged in parallel horizontal series, refractory bars extending longitudinally of and between adjacent tubes in substantially the same horizontal plane to form a plurality of baffle plates in staggered relation one to the other, and perforated cleaning pipes extending longitudinally of and interspersed among the tubes and baffle plates, of a collector head provided with hollow ties arranged to interchangeably receive the tubes and pipes, the tubes communicating with the interior of the collector head and the pipes with the steam space of the boiler.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

JULES NICLAUSSE.
ALBERT NICLAUSSE.

Witnesses:

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