No. 840,725. PATENTED JAN. 8, 1907.

I. J. ULLENSAKER.

STEAM BOILER.

APPLICATION FILED MAY 11, 1906.

Fig. 1.

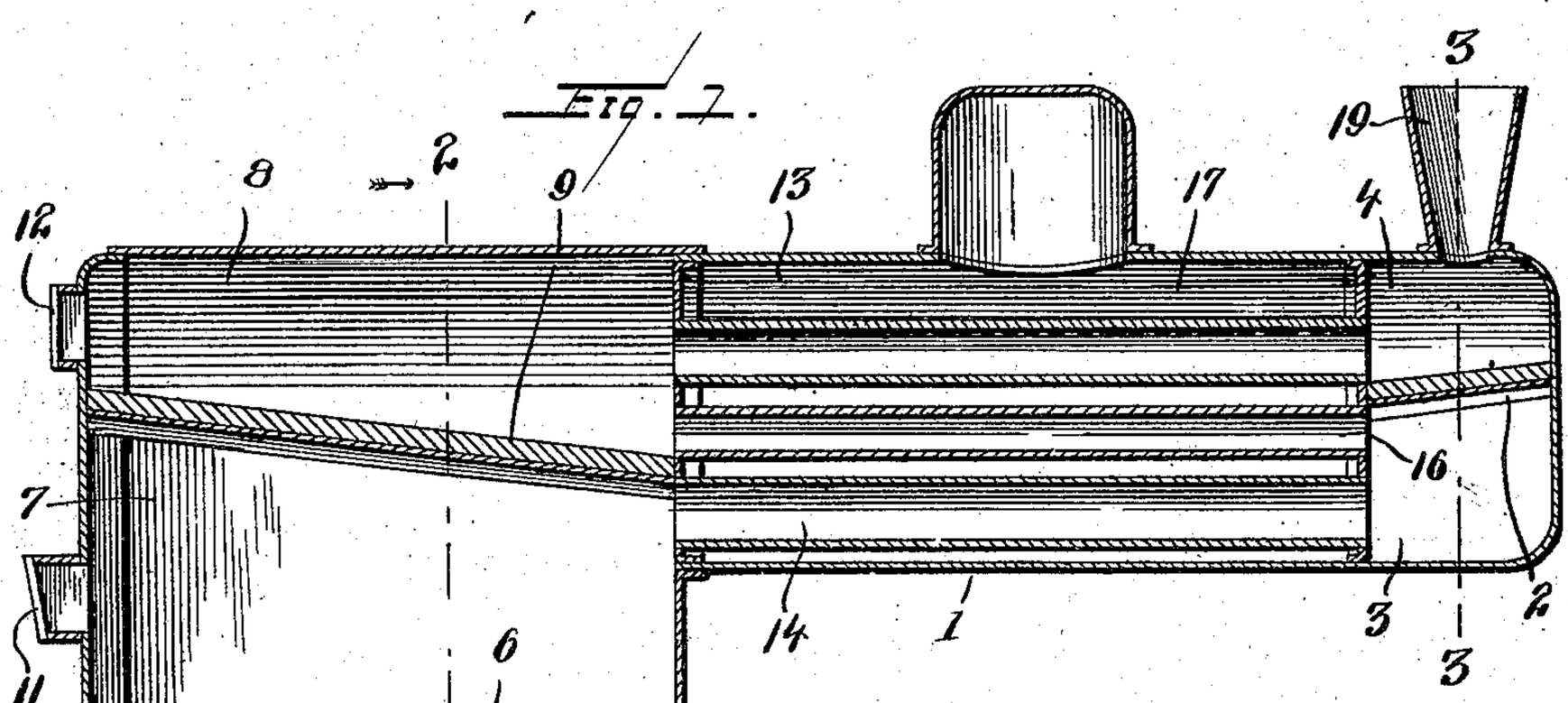

Fig. 2.

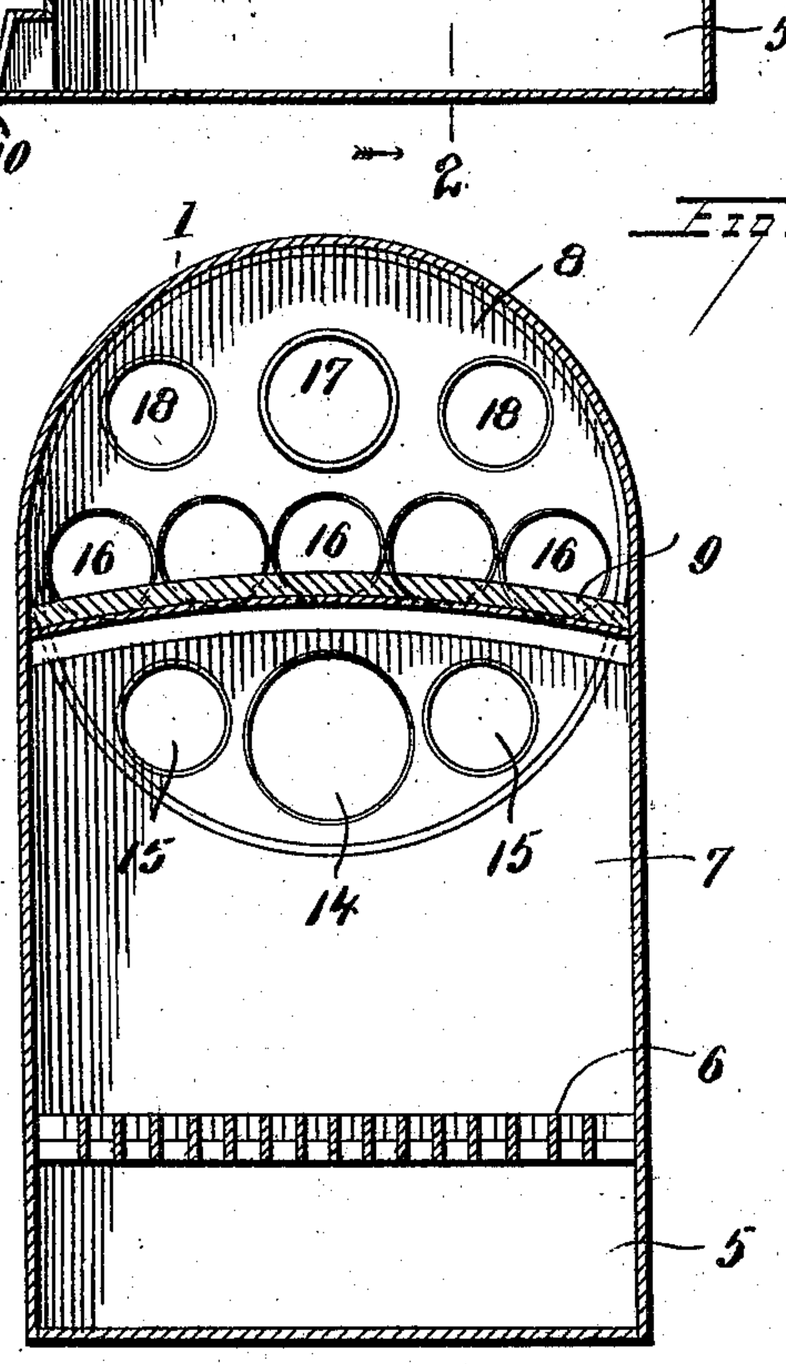

Fig. 3.

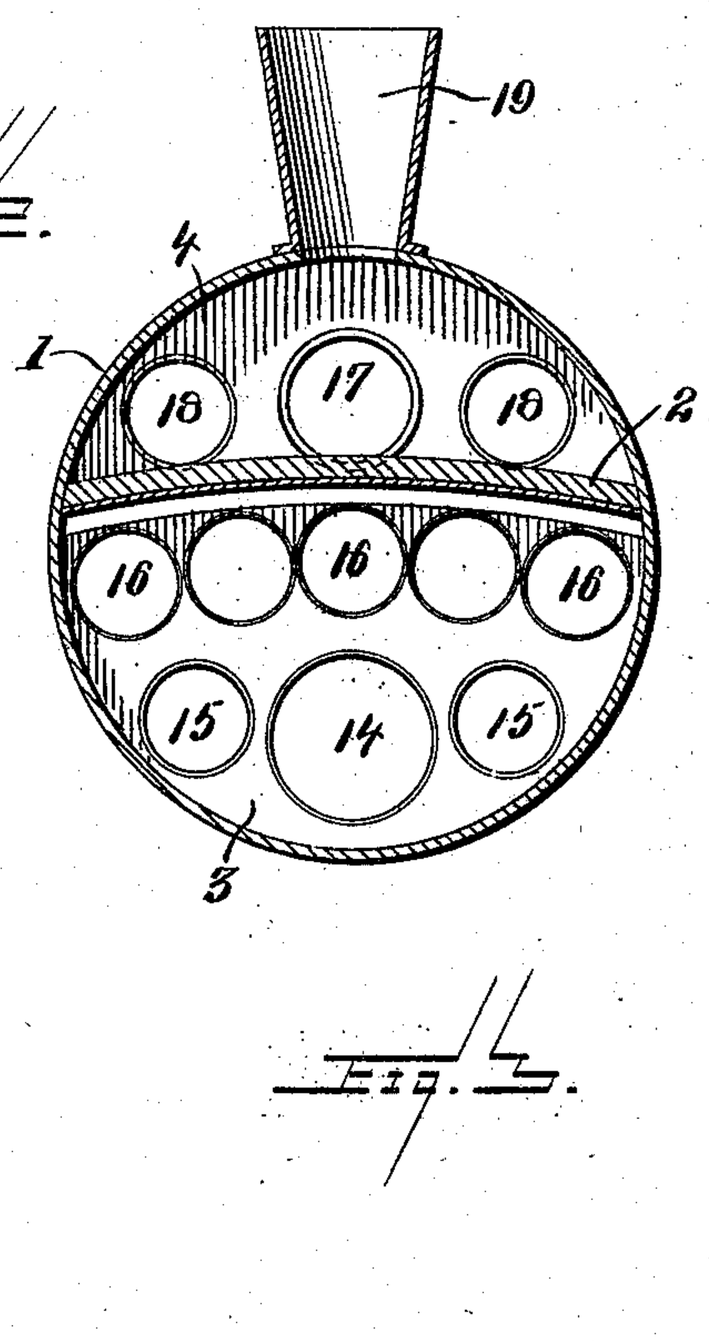

Fig. 4.

WITNESSES:

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UNITED STATES PATENT OFFICE.

INGEBRIGT J. ULLENSAKER, OF HATTON, NORTH DAKOTA.

STEAM-BOILER.

No. 840,725. Specification of Letters Patent. Patented Jan. 8, 1907.

Application filed May 11, 1906. Serial No. 316,410.

To all whom it may concern:

Be it known that I, INGEBRIGT J. ULLENSAKER, a citizen of the United States, residing at Hatton, in the county of Traill and State of North Dakota, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in steam-boilers of the fire-flue type; and it consists in the novel construction, combination, and arrangement of parts hereinafter described and claimed.

The object of the invention is to provide a boiler of this character of simple, durable, and inexpensive construction in which the heat of the fuel will be more fully utilized and the boiler thus rendered more efficient than those now in use.

Further objects and advantages of the invention, as well as the structural features by means of which they are attained, will be made clear by an examination of the following specification, taken in connection with the accompanying drawings, in which similar reference characters denote corresponding parts throughout the several views, and in which—

Figure 1 is a vertical longitudinal sectional view through a steam-boiler constructed in accordance with my invention; and Figs. 2 and 3 are vertical transverse sectional views taken, respectively, on the planes indicated by the lines 2 2 and 3 3 in Fig. 1.

Referring to the drawings by numeral, 1 denotes the cylindrical shell or casing of the boiler, which has the smoke space or box at its front end divided by a transversely-extending partition 2 into lower and upper smoke-chambers 3 and 4. The partition 2 is inclined downwardly and rearwardly and is rigidly mounted in the front end of the casing. The casing or shell at its rear is enlarged and of rectangular form, and in it is provided the usual ash-pit 5, which is separated by the fire-grate 6 from the fire box or chamber 7. A front smoke-chamber 8 is formed in the top of this rear portion of the casing by a transversely-extending partition 9, which separates it from the fire-box 7. The partition 9 is inclined downwardly and forwardly and is rigidly mounted, as shown. The usual doors 10 and 11 are provided in the rear wall of the ash-pit and fire-box, and a similar door 12 is provided to enable the front smoke-chamber 8 to be cleaned out. While the partitions 2 and 9 may be of any desired form and construction, I preferably arch or curve them transversely and make them of fire-brick, as illustrated in the drawings.

Extending longitudinally through the water and steam space 13 of the boiler, at the top of which space is the usual steam-dome, is a lower large or main fire-flue 14 and two or more smaller fire-flues 15. The flues 14 and 15 carry the fire, heat, smoke, and products of combustion forwardly from the fire-box 7 into the lower rear smoke-chamber 3, and they are carried rearwardly from the latter and into the front smoke-chamber 8 through a horizontal row or series of longitudinal smoke-flues 16, preferably five in number. From the chamber 8 the smoke, &c., again passes forwardly through a third horizontal row or series of smoke-flues consisting of an upper large or main one 17 and a number of smaller ones 18. The flues 17 and 18 discharge into the upper front smoke-chamber 4, from the top of which latter projects a smoke-stack 19. By constructing the boiler in this manner, so that the heat, smoke, gases, and products of combustion will pass three times through the boiler, all of the heat will be utilized and a much more efficient boiler is produced at a comparatively small increase in cost over that of the boilers now in general use.

From the foregoing description, taken in connection with the accompanying drawings, it is thought that the construction, operation, and advantages of the invention will be readily understood without a more extended explanation.

Various changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention as defined by the appended claim.

Having thus described my said invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

The herein-described steam-boiler comprising a cylindrical shell or casing having at its rear an enlarged rectangular portion, a transversely-extending stationary partition fixed in the front end of said casing and inclined downwardly and rearwardly to divide it into upper and lower smoke-chambers, a transversely-extending stationary partition fixed in the enlarged rear portion of said cas-

ing above the fire-grate therein and inclined downwardly and forwardly to separate its fire box or chamber from the upper rear smoke-chamber, a smoke-stack leading from the top of the upper smoke-chamber at the front of the casing, a door closing a clean-out opening at the end of the upper rear smoke-chamber, and three horizontal rows of fire-flues affording communication between the said chambers of the casing, substantially as shown and described.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

INGEBRIGT J. ULLENSAKER.

Witnesses:
GEORGE MURRAY,
EDWIN P. STILL.