

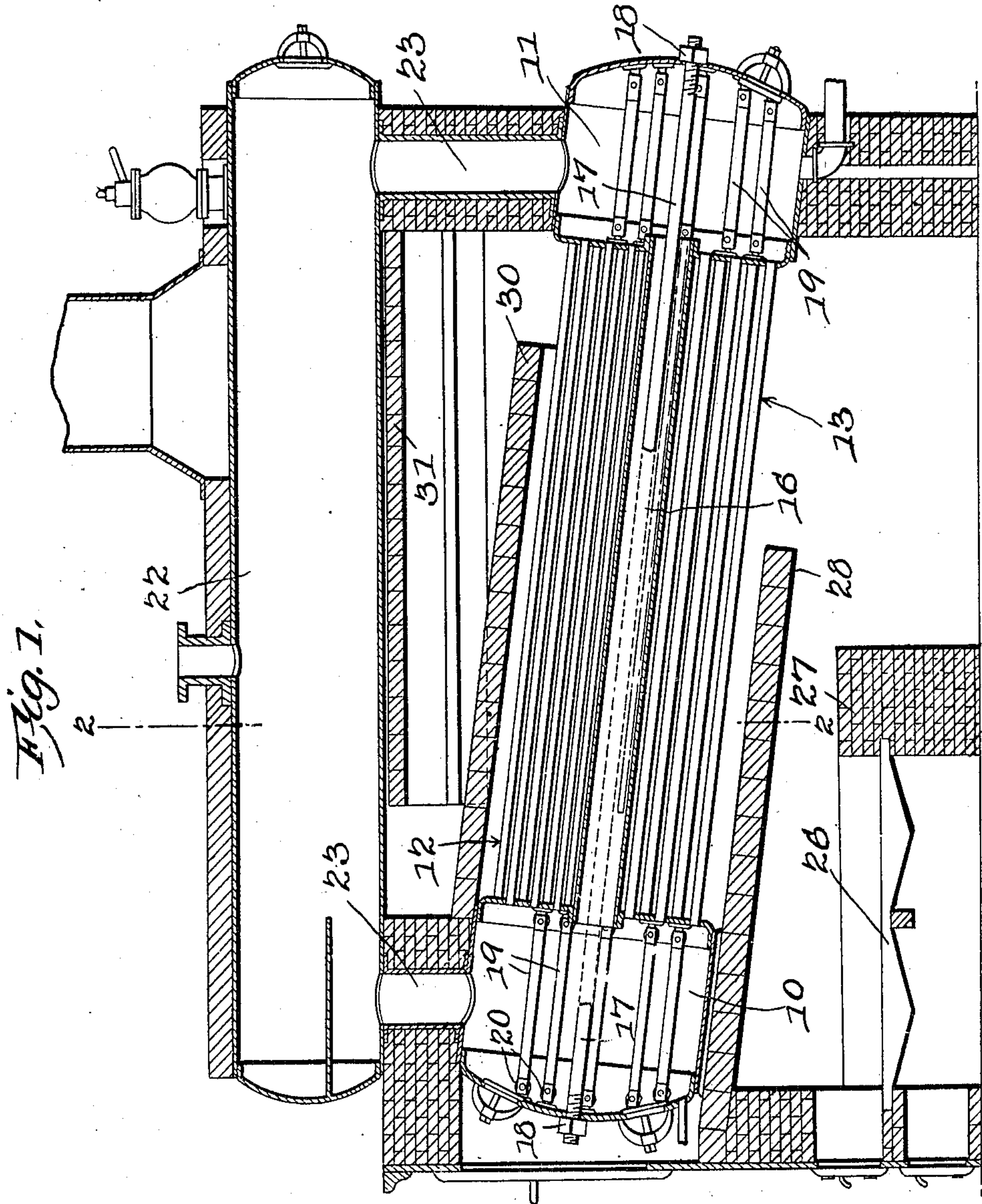
No. 871,691.

PATENTED NOV. 19, 1907.

M. T. GOSS.
BOILER.

APPLICATION FILED JULY 18, 1906.

3 SHEETS—SHEET 1.



WITNESSES:

E. J. Stewart
J. H. Parker

Milford T. Goss,
INVENTOR

By *C. A. Snow & Co.*
ATTORNEYS

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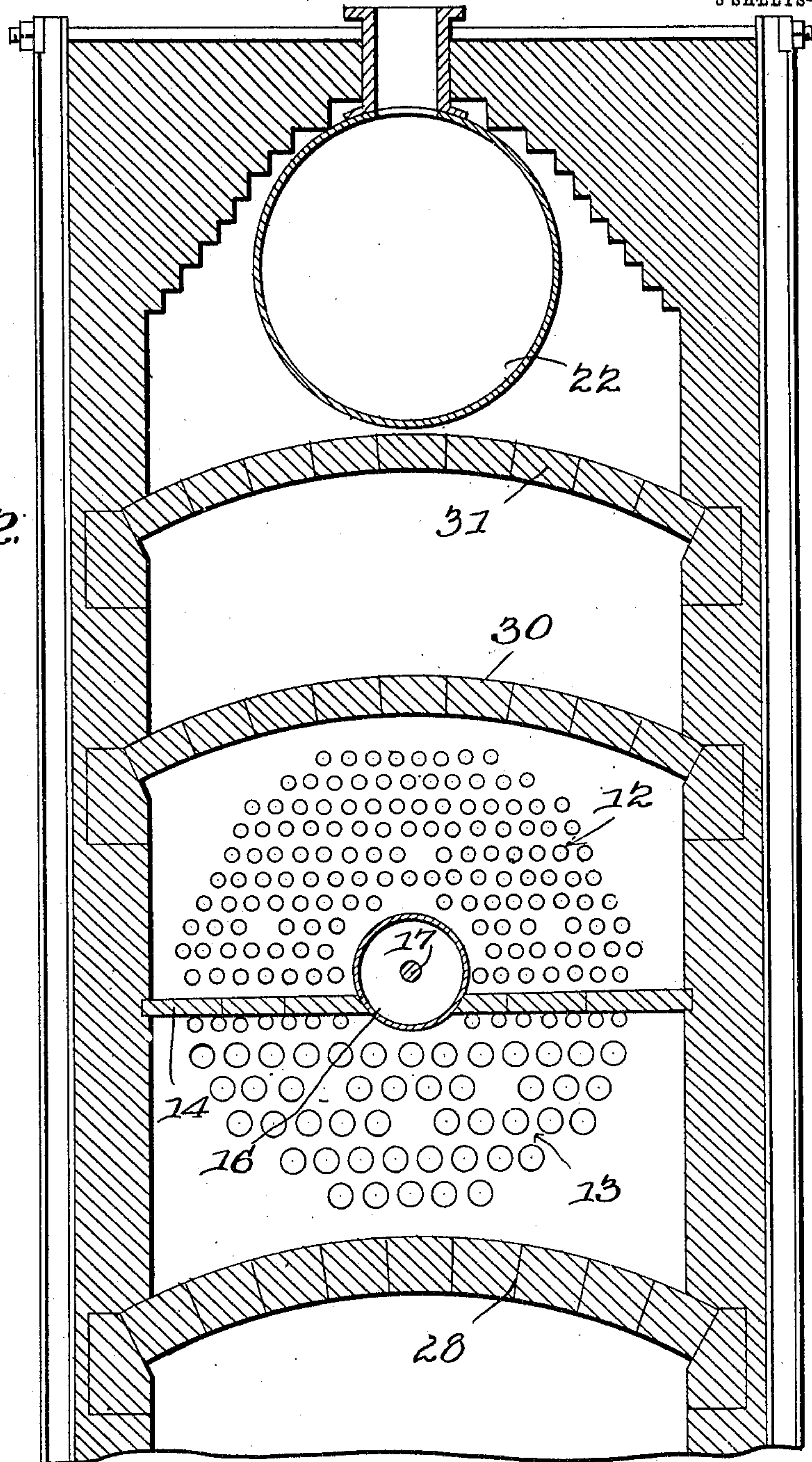
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3 SHEETS—SHEET 2.

Fig. 2.



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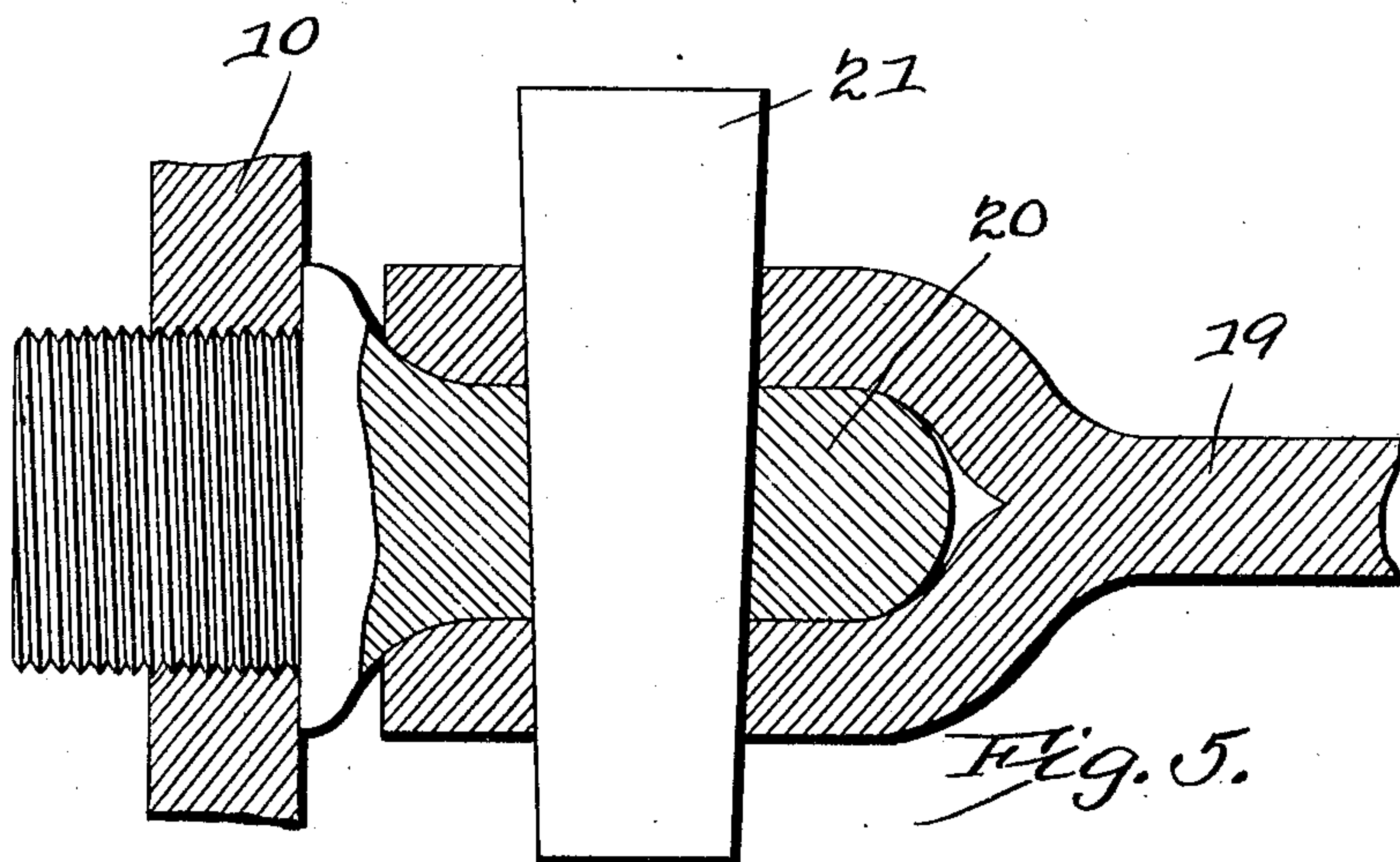
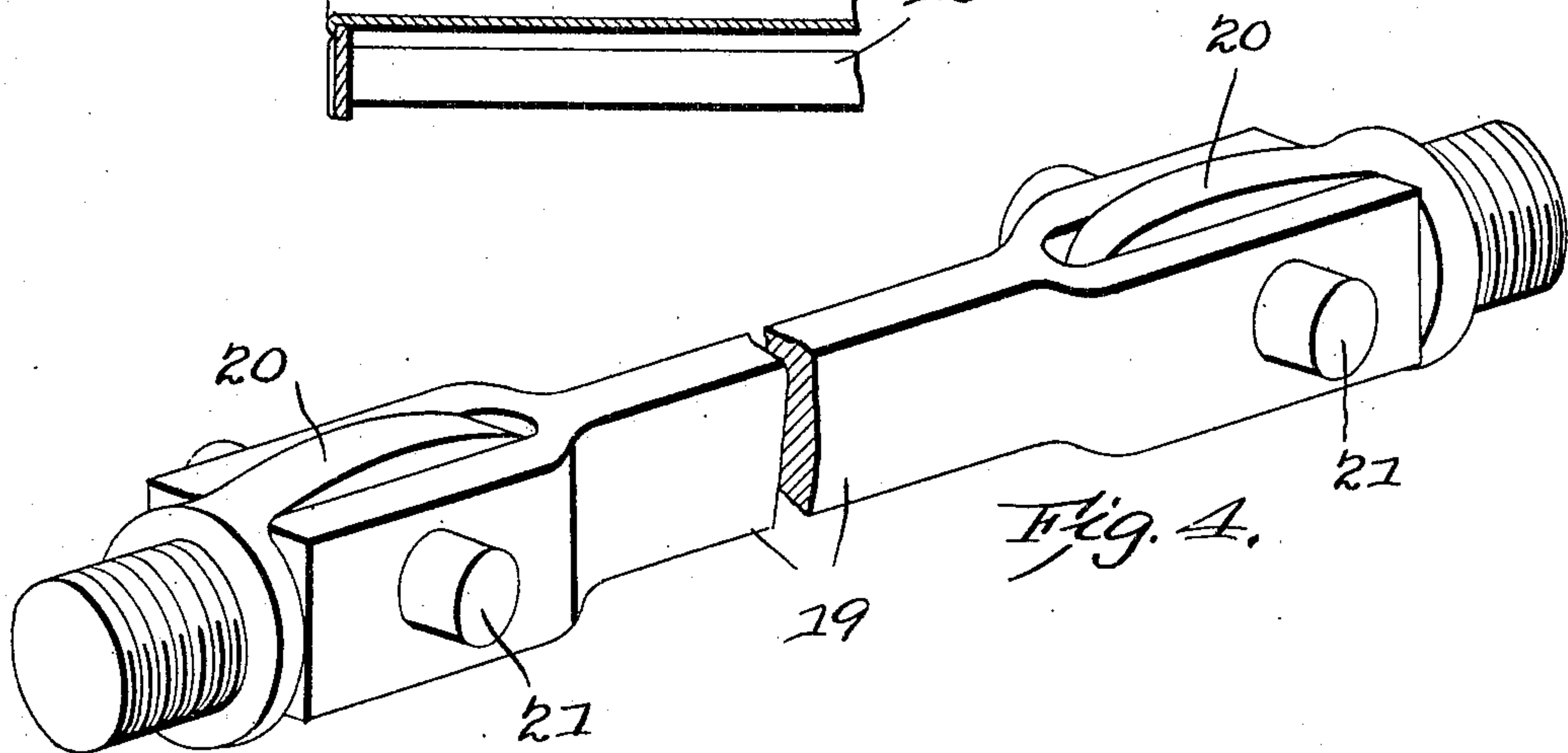
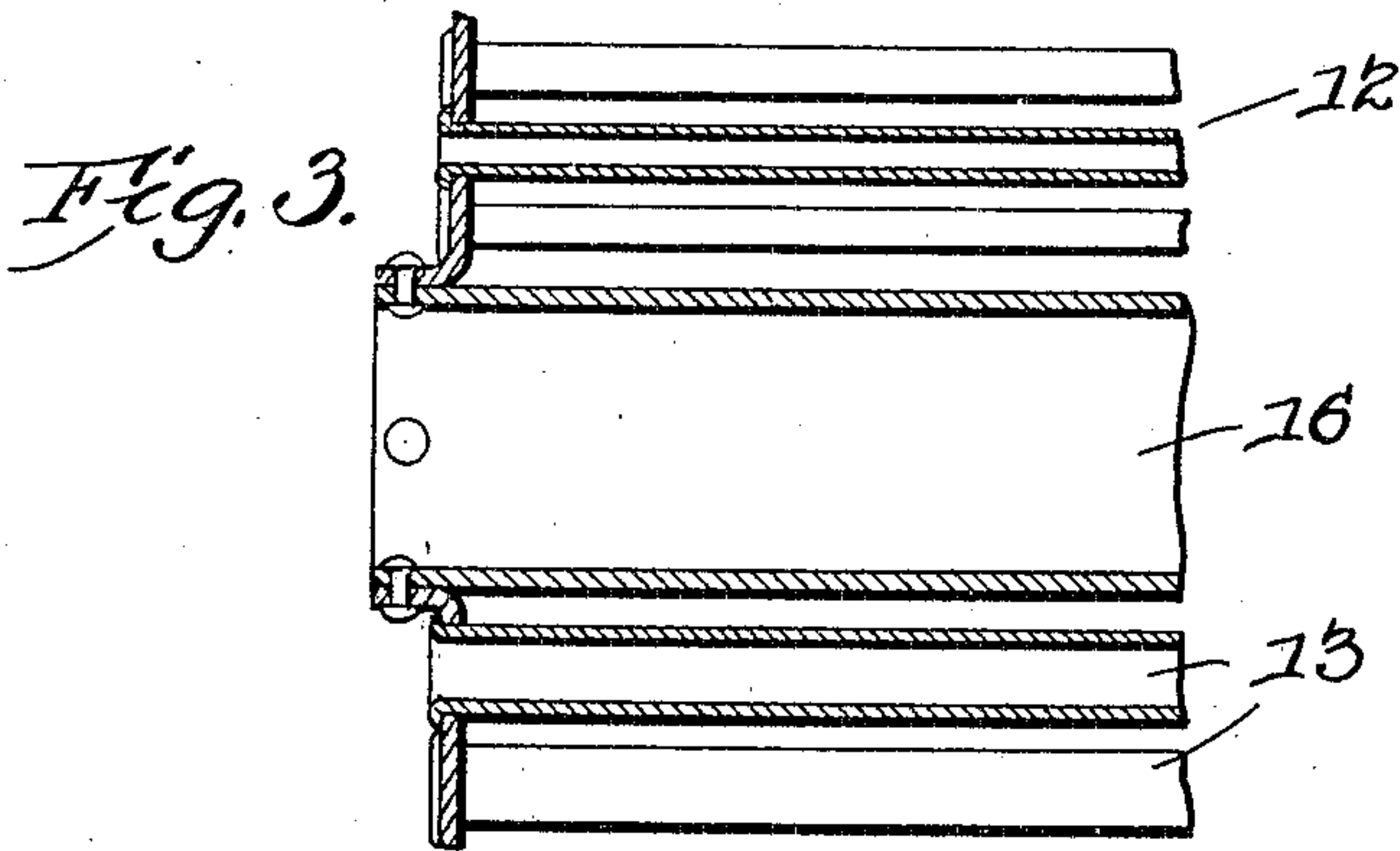
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3 SHEETS—SHEET 3.



WITNESSES:

E. H. Stewart
Jas. E. Ramey

Milford T. Goss, INVENTOR

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UNITED STATES PATENT OFFICE.

MILFORD T. GOSS, OF CHICAGO, ILLINOIS.

BOILER.

No. 871,691.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed July 18, 1906. Serial No. 326,785.

To all whom it may concern:

Be it known that I, MILFORD T. GOSS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Boiler, of which the following is a specification.

This invention relates to steam boilers, and has for one of its objects to provide a quick steaming boiler in which the heat of the products of combustion may be utilized to the fullest extent.

A further object of the invention is to provide a water tube boiler in which the water tubes are of smaller diameter than usual and placed so closely together as to prevent the free passage of the products of combustion, so that the water within the tubes may absorb the heat.

A still further object of the invention is to provide a water tube boiler in which a centrally arranged tube of relatively large diameter is employed as a column to brace the tube sheets and prevent the bulging of the sheets due to the pressure within the end drums.

A still further object of the invention is to provide a novel form of water tube boiler that is thoroughly braced throughout, and in which the baffle plates are so arranged as to maintain the heated gases of combustion in contact with the tubes and drums for a comparatively long period of time.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings:—Figure 1 is a sectional elevation of a steam boiler constructed in accordance with the invention. Fig. 2 is a transverse sectional elevation of the same on the line 2—2 of Fig. 1. Fig. 3 is a detail sectional view of a portion of the boiler, drawn to an enlarged scale. Fig. 4 is a perspective view of one of the braces. Fig. 5 is a sectional view, on an enlarged scale, of one of the brace connections.

Similar numerals of reference are employed to indicate corresponding parts

throughout the several figures of the drawings.

The boiler forming the subject of the present invention is of the water tube type, and is provided with front and rear drums 10 and 11 that are connected by inclined water tubes 12 and 13, these being arranged in two sets, disposed one above the other, and separated by an inclined baffle plate 14 which extends from the rear drum 11 to a point adjacent to the front drum, in order that the products of combustion may be first directed into engagement with the lower tubes 13, and then forced to travel to the rear in contact with the upper tubes 12.

The majority of the tubes are two inches in diameter, and are placed closely together in order to prevent the free passage of the products of combustion, while a number of the tubes, especially those in the lower portion of the lower bank 13, are three inches in diameter, and are also placed closely together for a similar purpose, the larger tubes being employed in the lower bank in order to prevent the possibility of displacement of water by steam and burning tubes, when the temperature of the furnace is very high, which might be experienced if all two inch tubes were used.

In order to reinforce the tube sheets, a large tube 16 is connected to the central portions of the sheets, the latter being provided with flanged openings, and said tube serves as a column which prevents bulging of the sheets due to the heavy pressure within the end drums. The structure is, also, reinforced and strengthened by a tension rod 17 which extends through the large tube 16 and connects the convex heads of the drums, the rod extending through suitable openings formed at the centers of the heads and being provided with nuts 18 that bear against the outer surfaces of said heads. As a further precaution, a number of stays or braces 19 are arranged between the tube sheets and the convex heads, these braces being coupled to blocks 20 by lynch pins 21, and the blocks being provided with reduced threaded portions that are adapted to threaded openings formed in the flue sheets and heads, it being unnecessary to employ nuts on the threaded portions of the blocks in order to retain the same in position. Should there be any leakage around the threaded portions of the blocks, the latter may be backed out, and packing of any suitable nature introduced

between the ends of the blocks and the adjacent faces of the tube sheets or heads.

The upper steam drum 22 is connected to the end drums by cylindrical tubes 23, and these are preferably bricked in to form the front and rear walls of the furnace proper.

Arranged below the forward portion of the boiler is the usual grate 26 and bridge wall 27, and above these and extending rearward of the bridge wall is an arch 28 by which the products of combustion may be first directed into engagement with the rear ends of the tubes of the lower bank, after which the burning gases move forward under the baffle 14, and thence are directed rearward by a baffle 30 above the upper bank of tubes. Immediately below the steam drum 22 is a forwardly extending baffle 31 that terminates short of the front wall, so that the products of combustion will be compelled to pass around the steam drum before finally escaping, so that the drum may be utilized as a superheater.

In practice, the upper bank and a part of the lower bank of tubes are made two inches in diameter and are spaced three inches from center to center, while the larger lower tubes are three inches in diameter and spaced four inches from center to center. In some cases, however, both banks may be formed wholly of two inch or of three inch tubes.

I claim:—

In a steam boiler, a furnace, end drums supported by the furnace walls, upper and lower baffles extending rearward from below the bottom and above the top of the forward drum, the inner heads of the drums forming tube sheets, said tube sheets being provided with centrally disposed openings having flanged walls, a water tube of large diameter disposed centrally of the boiler and riveted to the flanges, said tube serving to reinforce the tube sheets and to connect the drums, baffle plates built inward from the opposite sides of the furnace walls into contact with the sides of said water tube, braces connecting the tube sheets to the outer heads of the drums, a pair of banks of water tubes connecting the end drums and spaced from each other by the central baffle plate, the tubes of the upper bank being of smaller diameter than those of the lower bank, and a bolt extending through the large water tube and connected to the outer heads of the drums, substantially as specified.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

MILFORD T. GOSS

Witnesses:

ANNA M. ITEN,
ANNA RIDGEWAY.