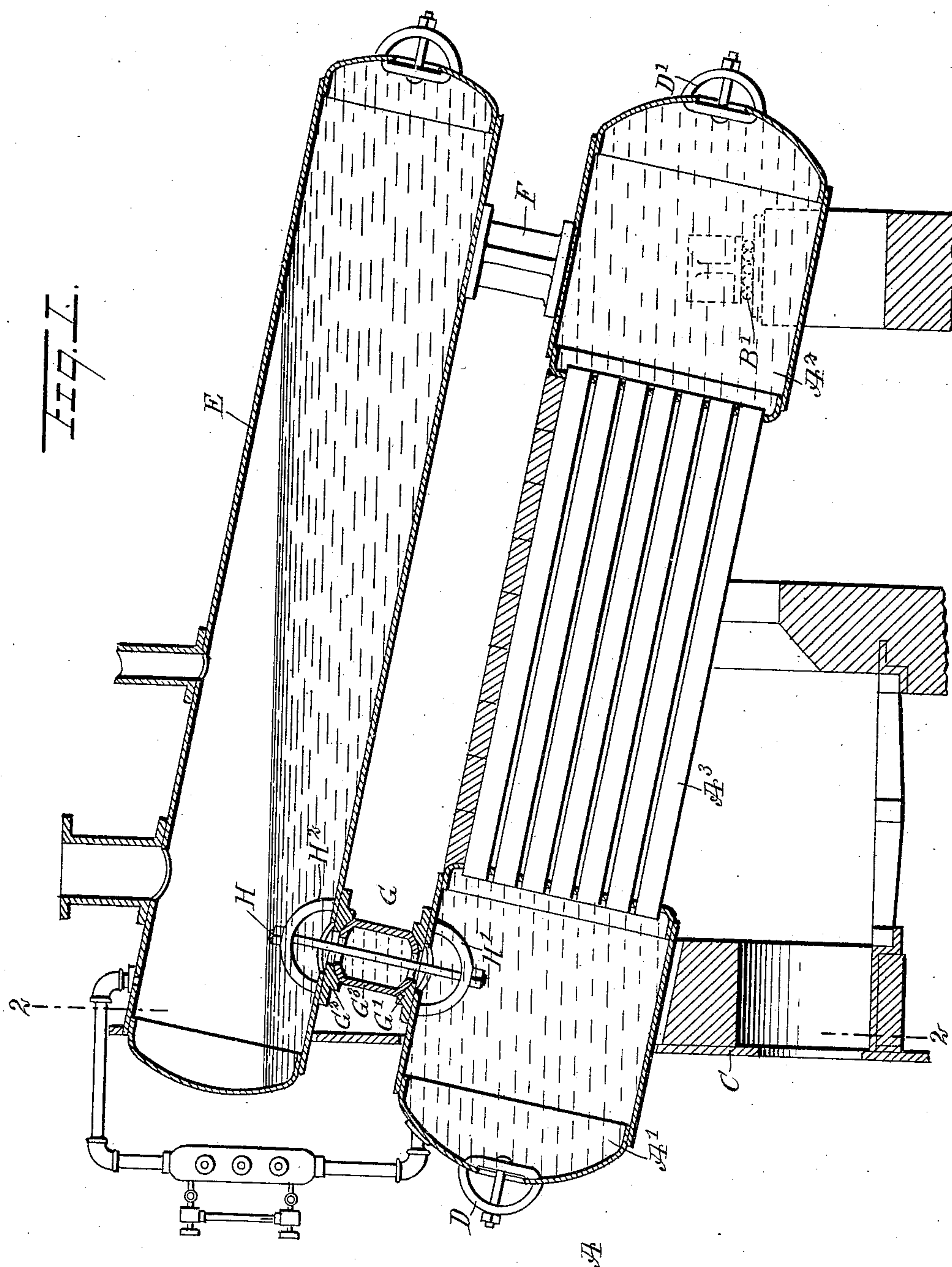


No. 869,829.

PATENTED OCT. 29, 1907.

H. COX.
STEAM GENERATOR.
APPLICATION FILED JUNE 8, 1907.

2 SHEETS—SHEET 1.



WITNESSES

H. Walker
R. G. Hooper

INVENTOR

Howard Cox
BY Munn & Co.

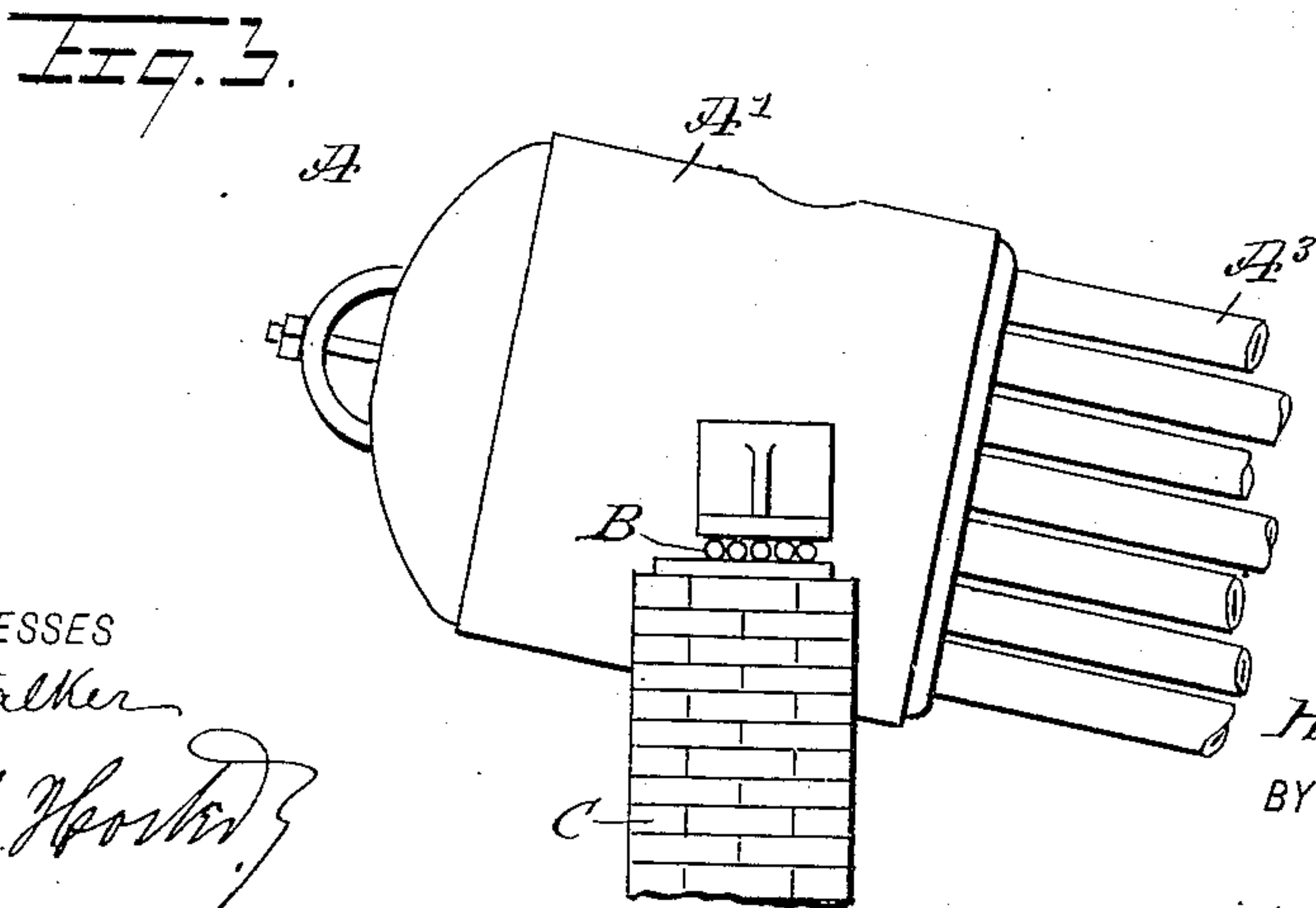
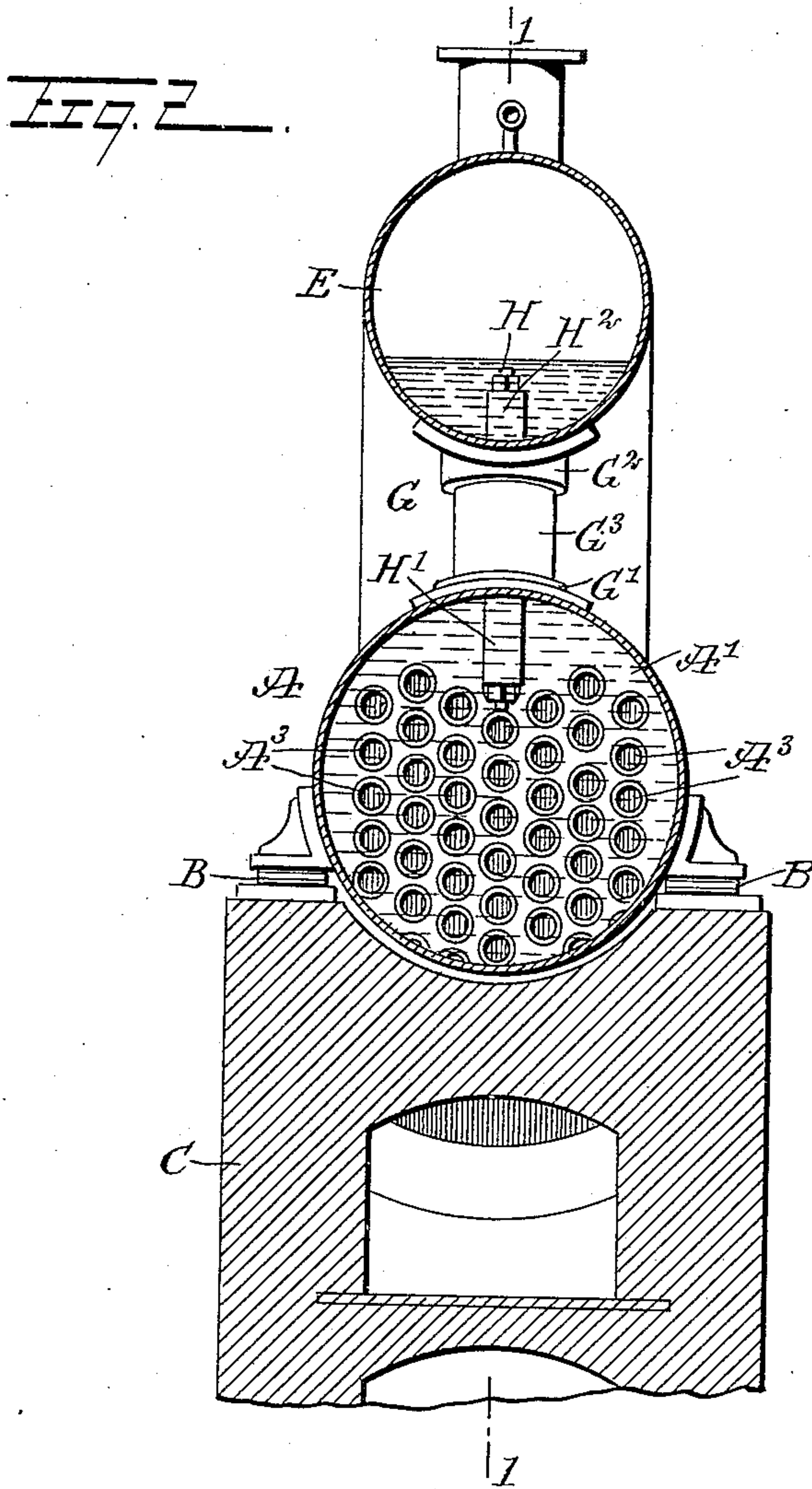
ATTORNEYS

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WITNESSES
H. Walker
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UNITED STATES PATENT OFFICE.

HOWARD COX, OF ABRAHAM, UTAH.

STEAM-GENERATOR.

No. 869,829.

Specification of Letters Patent.

Patented Oct. 29, 1907.

Application filed June 8, 1907. Serial No. 377,865.

To all whom it may concern:

Be it known that I, HOWARD COX, a citizen of the United States, and a resident of Abraham, in the county of Millard and State of Utah, have invented a new and Improved Steam-Generator, of which the following is a full, clear, and exact description.

The invention relates to water tube steam boilers, and its object is to provide a new and improved steam generator, which is simple and durable in construction, devoid of undesirable flat surfaces, internal stays, stay bolts, braces and the like, and arranged to compensate for the unequal expansion and contraction of the boiler relative to the steam drum, and to permit convenient access to the various parts for removing scale, sediment, etc.

The invention consists of novel features and parts and combinations of the same, which will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a longitudinal sectional elevation of the improvement on the line 1—1 of Fig. 2; Fig. 2 is a transverse section of the same on the line 2—2 of Fig. 1, and Fig. 3 is a side elevation of the improvement showing more particularly one of the roller bearings for the boiler.

The water tube boiler A is provided with the front head A', the rear head A² and the water tubes A³ connecting the said heads with each other. The heads A', A² are mounted on roller bearings B, B' held on the boiler support C of any approved construction, and in such a manner as to incline the water tube boiler A downwardly and rearwardly, as illustrated in Fig. 1. The aggregate length of the heads A', A² somewhat exceeds the distance between the heads A', A², and the outer ends of the heads A', A² are provided with man-holes D, D', to permit convenient access to the interior of the heads A', A² for cleaning or repairing purposes. Now by the arrangement described the water tubes A³ are sufficiently short to render the use of stays, stay bolts, braces and the like unnecessary, and at the same time convenient access is had to the heads A', A² and the water tubes A³ by way of the man-holes D, D', to allow convenient cleaning of the water tubes A³ from both ends. The above arrangement also permits the use of a tube cleaner of a length equal to the length of the head, and since the aggregate length of the heads is greater than the length of the tube it may be cleaned by working from opposite ends, thus avoiding the necessity for providing more than one hole in each head.

The steam drum E is arranged parallel to the water tube boiler A, and is connected with the same by con-

nections F and G, of which the connection F rigidly connects the rear head A³ with the rear end of the steam drum E, while the connection G connects the front head A' with the front end of the steam drum E yieldingly, to compensate for unequal expansion and contraction of the boiler A relative to the steam drum E. This yielding connection G consists of apertured sockets G', G² secured to the head A' and the steam drum E, respectively, and in the said sockets are seated the spherical ends of a tube G³, so as to allow the steam drum E to yield relative to the boiler A or vice versa. A bolt H extends centrally through the connection G and engages stirrups H', H² held in the head A' and the drum E, thus holding the tube G³ firmly in its sockets and thereby preventing leakage.

The generator is provided with the usual accessories, but as their arrangement and construction are similar to those used in other steam generators, it is not deemed necessary to further describe the same.

Now when a fire is started in the fire box of the steam generator, then the boiler A is heated before the steam drum E is subjected to the heat, and consequently an unequal expansion takes place relative to the boiler A and the steam drum E, and by having the yielding connection G it is evident that this unequal expansion is duly compensated for.

The steam generator shown and described is simple and durable in construction and composed of comparatively few parts, not liable to easily get out of order.

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

1. A steam generator, comprising a water tube boiler provided with heads, and tubes connecting the heads with each other, a steam drum above the boiler, connections between the boiler and the steam drum at each end, one of said connections comprising a tube having spherical ends, the boiler and the steam drum being provided with sockets shaped to fit the ends of the tubes, stirrups within the steam drum and the boiler, and a bolt connecting the stirrups and traversing the tube whereby to connect the parts together.

2. A steam generator having a water tube boiler, and a steam drum rigidly connected at one end with one end of the water tube boiler, and a yielding connection between the other ends of the said water tube boiler and the said steam drum.

3. A steam generator having a water tube boiler provided with front and rear heads and tubes connecting the heads with each other, a steam drum, a rigid connection between the rear head of the said water tube boiler and the rear end of the said steam drum, and a yielding tubular connection between the front head of the said water tube boiler and the front end of the said steam drum.

4. A steam generator having a water tube boiler provided with front and rear heads and tubes connecting the heads with each other, a steam drum, a rigid connection between the rear head of the said water tube boiler and the rear end of the said steam drum, apertured ball sockets secured opposite each other on the front head of the said water tube boiler and the front end of the said steam

drum, and a connecting tube having spherical ends seated in the said sockets.

5. A steam generator having a water tube boiler provided with front and rear heads and tubes connecting the
5 heads with each other, a steam drum, a rigid connection between the rear head of the said water tube boiler and the rear end of the said steam drum, apertured ball sockets secured opposite each other on the front head of the said
10 water tube boiler and the front end of the said steam drum, a connecting tube having spherical ends seated in

the said sockets, and a bolt and stirrup connection connecting the water tube boiler and steam drum at the said connecting tube and sockets.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses. 15

HOWARD COX.

Witnesses:

GEORGE BROOKS,
MARION BLACK.