

No. 784,293.

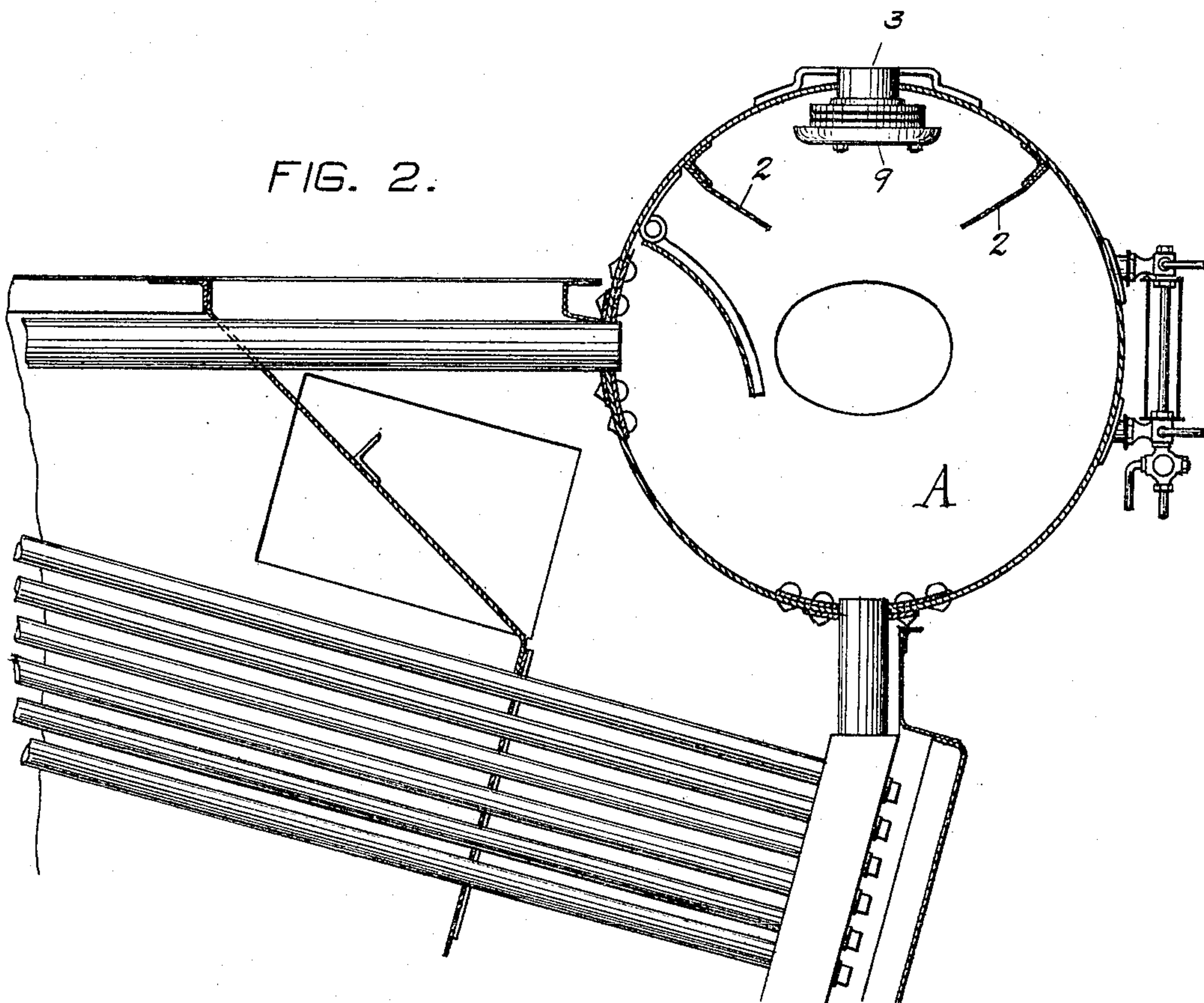
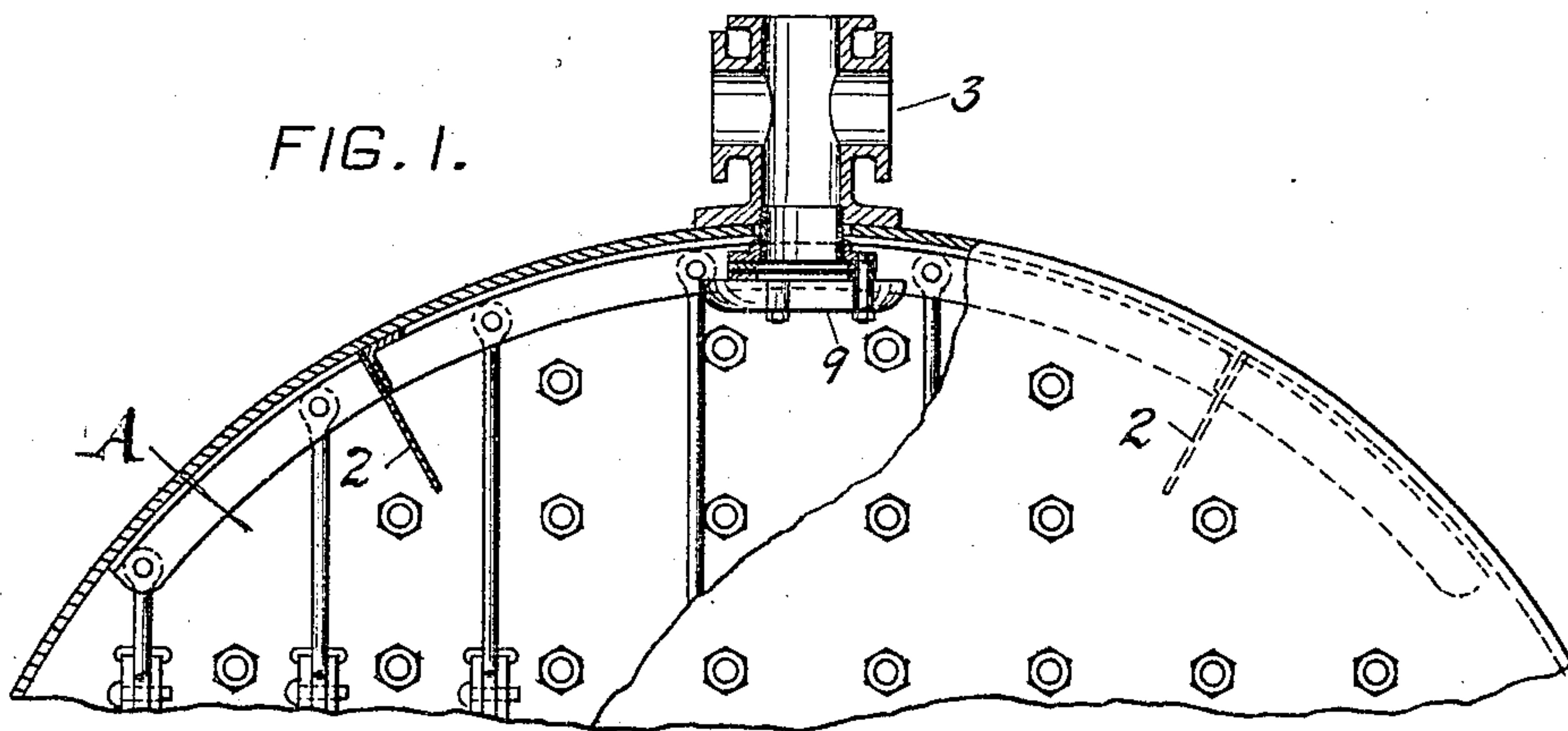
PATENTED MAR. 7, 1905.

H. V. ARNOLD & A. H. KRESS.

STEAM DRYING DEVICE.

APPLICATION FILED MAY 2, 1904.

2 SHEETS—SHEET 1.



WITNESSES,

Chas. E. Chapin.

[Signature]

INVENTORS

Harry V. Arnold

Augustus H. Kress

By *Geo. H. Strong* atty.

No. 784,293.

PATENTED MAR. 7, 1905.

H. V. ARNOLD & A. H. KRESS.

STEAM DRYING DEVICE.

APPLICATION FILED MAY 2, 1904.

2 SHEETS—SHEET 2.

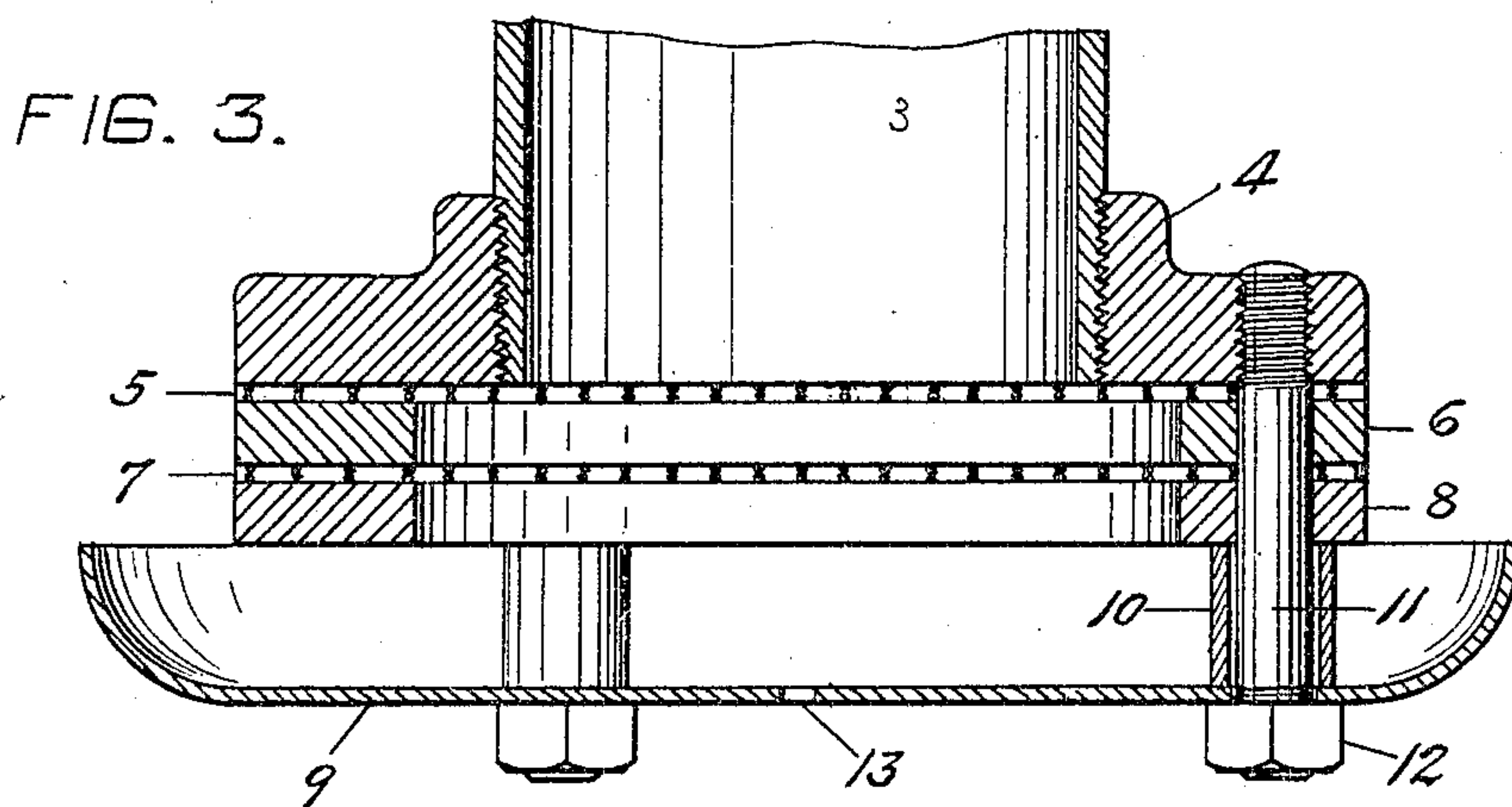
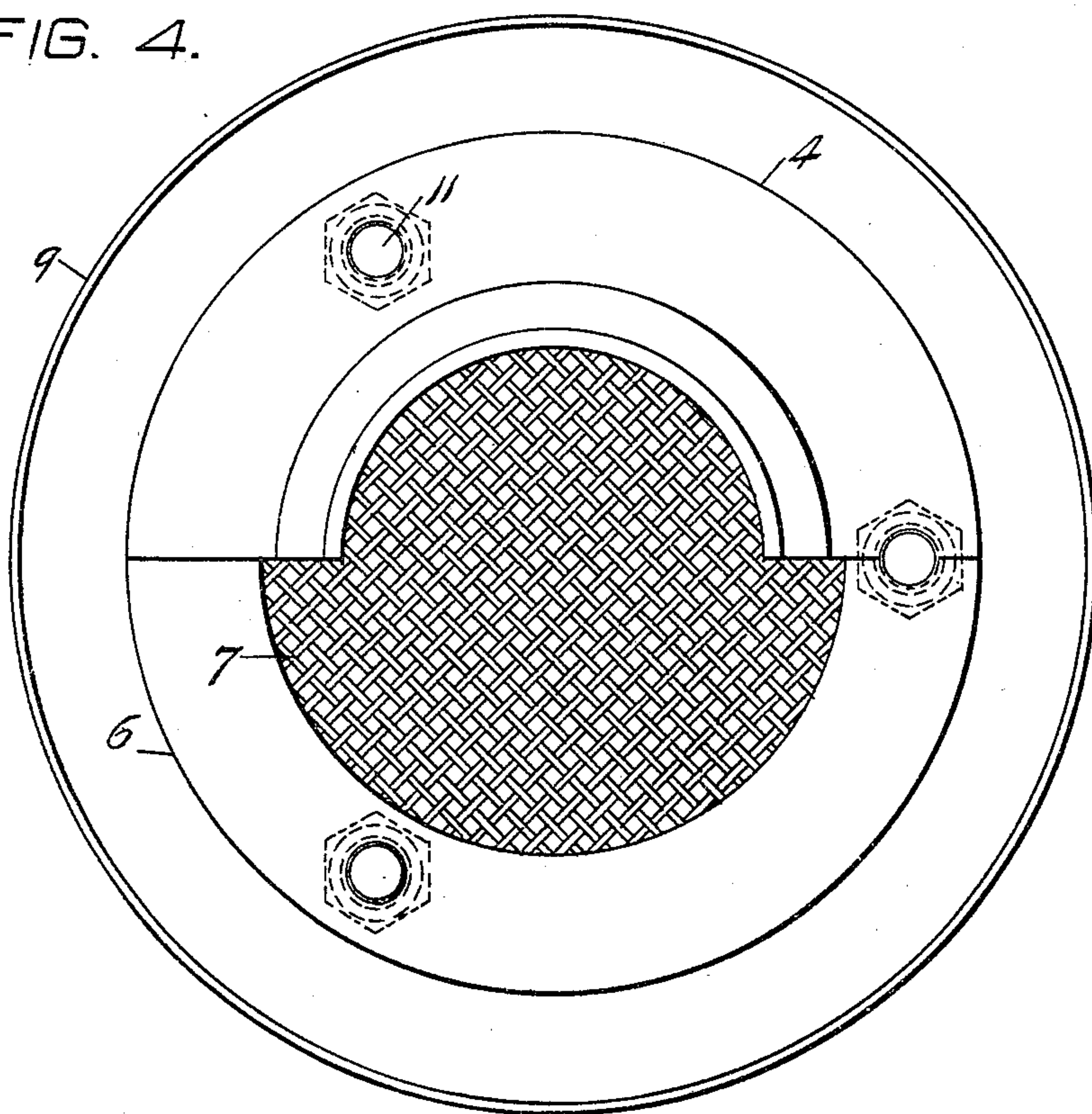


FIG. 4.



WITNESSES,

Chas. F. Chapin.

George A. House

INVENTORS,

Harry V. Arnold
Augustus H. Kress
By Geo. H. Strong atty

UNITED STATES PATENT OFFICE.

HARRY V. ARNOLD AND AUGUSTUS H. KRESS, OF SAN FRANCISCO,
CALIFORNIA.

STEAM-DRYING DEVICE.

SPECIFICATION forming part of Letters Patent No. 784,293, dated March 7, 1905.

Application filed May 2, 1904. Serial No. 205,982.

To all whom it may concern:

Be it known that we, HARRY V. ARNOLD and AUGUSTUS H. KRESS, citizens of the United States, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Steam-Drying Devices, of which the following is a specification.

Our invention relates to a device which is especially designed to separate steam from water with which it is associated in steam-boilers and the like and to produce a substantially dry steam for use.

It consists in the combination and arrangement of parts and in details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a view, partly in section, of a "Scotch" boiler, showing the application of our apparatus. Fig. 2 is a part section of a water-tube boiler, showing the same. Fig. 3 is an enlarged section of our device. Fig. 4 is a plan view of same with top flange partly broken away.

It is the object of our invention to provide a device which is especially applicable to steam-boilers and like generators for the purpose of obtaining dry steam for such use as may be required.

In the ordinary construction of boilers and generators the steam generated by the ebullition of the water carries up with it a considerable proportion of moisture, and this especially creeps up the side of the boiler and is carried by the rush of steam into the steam-drum or other receptacle, so that the steam is there loaded with moisture. Our invention is designed to separate and precipitate this moisture, so that steam may pass into the steam drum or pipe in a comparatively dry condition.

We have shown the application of our apparatus to two forms of boilers—namely, the Scotch boiler and the "water-tube" boiler; but it will be understood that it is equally applicable to locomotive and other similar boilers.

As shown in the drawings, A is the upper

part of the boiler or, in the case of water-tube boilers, the receptacle into which the steam from the lower portion is delivered.

2 represents plates fixed in the boiler or receptacle and extending toward the center thereof, so that as the moisture-laden steam passes up the sides of the steam-receptacle it strikes these plates, and a large portion of the moisture is separated therefrom and drops back into the water below. The steam passing around the edges of these plates on its way to the delivery-pipe is again obstructed as follows: 3 represents the delivery-pipe leading to the steam drum or pipe, and to the inner end of this, within the upper part of the boiler, is secured a ring or flange 4, having an opening through it coincident with that of the pipe. Beneath this flange is fixed a screen 5, which may have any suitable mesh. We have found that one-quarter-inch mesh is very efficient for the purpose. Beneath this screen is a ring 6, and beneath this ring a second screen 7. Another ring 8 is located beneath the screen 7. Beneath the ring 8 is a pan or receiver 9, and this has a larger diameter than the rings and screen, so that there is an annular opening in the upper part of this pan surrounding the rings and through which steam may enter from the upper part of the boiler. This pan is held at a sufficient distance from the rings by tubular sleeves 10, extending between the lowermost ring 8 and the bottom of the pan, and holes being made through the bottom of the pan the ring-bolts 11 are screwed into the ring or flange 4, which is secured to the discharge-pipe, and by means of nuts upon the lower ends of the bolts or equivalent means these pipes are all firmly secured together. The steam, after striking the plates 2, will then pass in a more or less tortuous direction into the pan, thence striking the screens 7 5. The moisture carried by the steam at this point will be deposited upon these screens and will then drip back into the pan 9. By this disposition of the parts the moisture-laden steam is prevented from being carried into the steam drum or pipe by the rush of the steam, and the water which falls into the pan may be discharged through a central open-

ing, as at 13, which allows it to drip back into the boiler.

By this device we have greatly increased the efficiency of the steam and reduced the expense for fuel.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. A steam-drying attachment for boilers consisting of precipitating-plates located in the boiler above the water-line and extending inwardly in converging plates substantially across the path of the ascending steam and a separating device at the inner end of the steam-discharge pipe and made pan-shaped, and over the edge of which the steam passes to said pipe, said device of greater diameter than the discharge-pipe, and spaced from the latter, and a plurality of screens between the device and the inlet end of the pipe.

2. A steam-drying attachment for boilers consisting of a ring fixed to the steam-discharge pipe, a plurality of rings and intermediate screens at the inlet to said pipe, a pan underlying the lowermost ring, means spacing the pan from the last-named ring, and bolts passing through the pan, and the rings and

screwed into engagement with the first-named ring.

3. An improved steam-drying attachment for boilers and the like said attachment comprising plates fixed to the sides of the boiler above the water-line and extending inwardly toward each other and substantially transversely across the path of the ascending steam, a pan-shaped vessel disposed axially in line with the steam-discharge pipe and the space between the inner ends of said plates, and of larger diameter than said pipe, a plurality of screens and rings fixed across the end of said pipe, a ring on the pipe against which the uppermost screen seats, spacing-sleeves between the lowermost ring and the bottom of the pan, and bolts passing through the pan and rings and engaging the ring on the said pipe.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

HARRY V. ARNOLD.
AUGUSTUS H. KRESS.

Witnesses:

R. S. BROWNE,
P. C. O'ROURKE.