No. 868,156 PATENTED OCT. 15, 1907.

J. B. BERRYMAN.

STEAM SEPARATOR.

APPLICATION FILED FEB. 7, 1905.

Fig. 1.

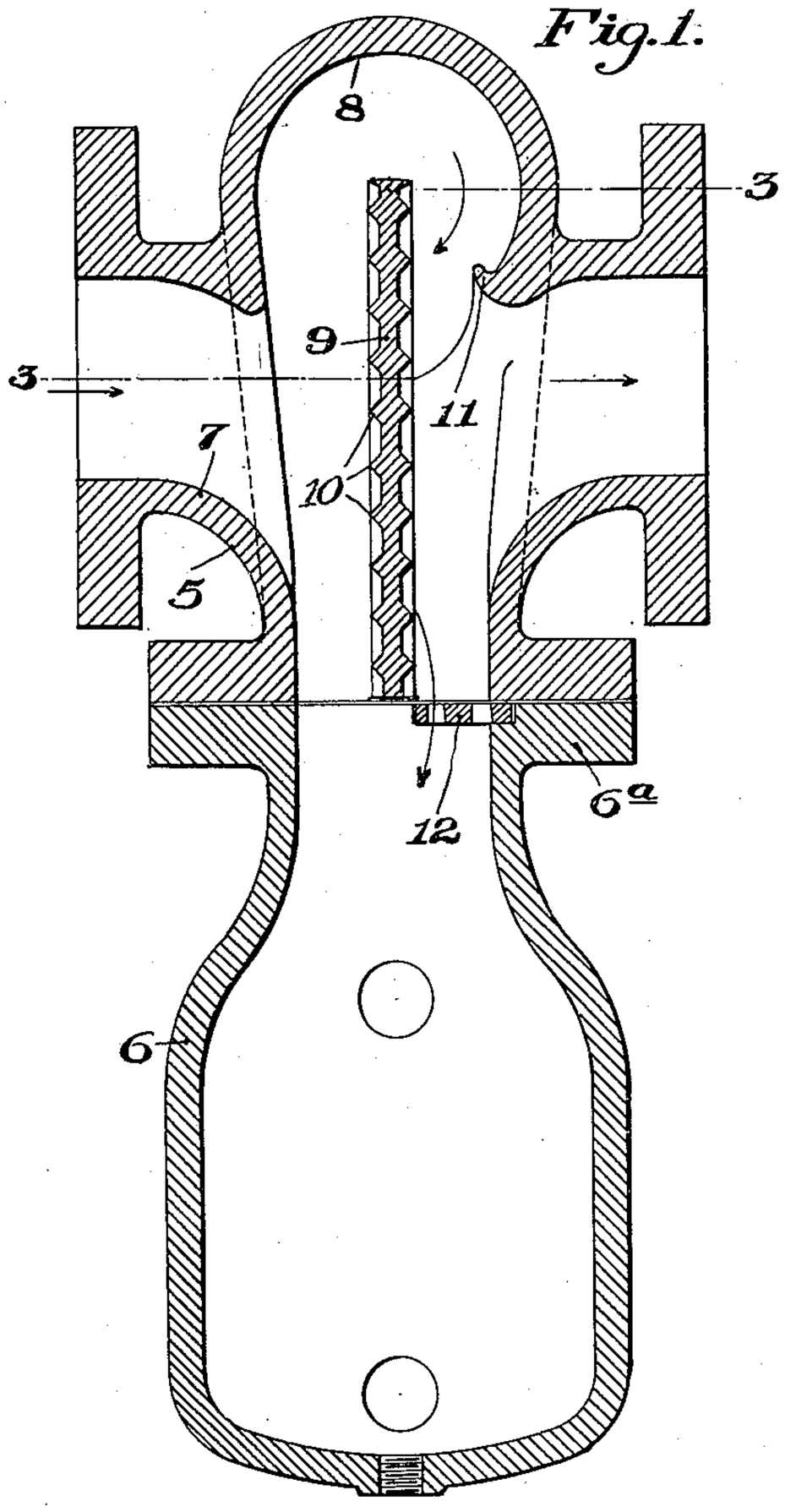


Fig. 2.

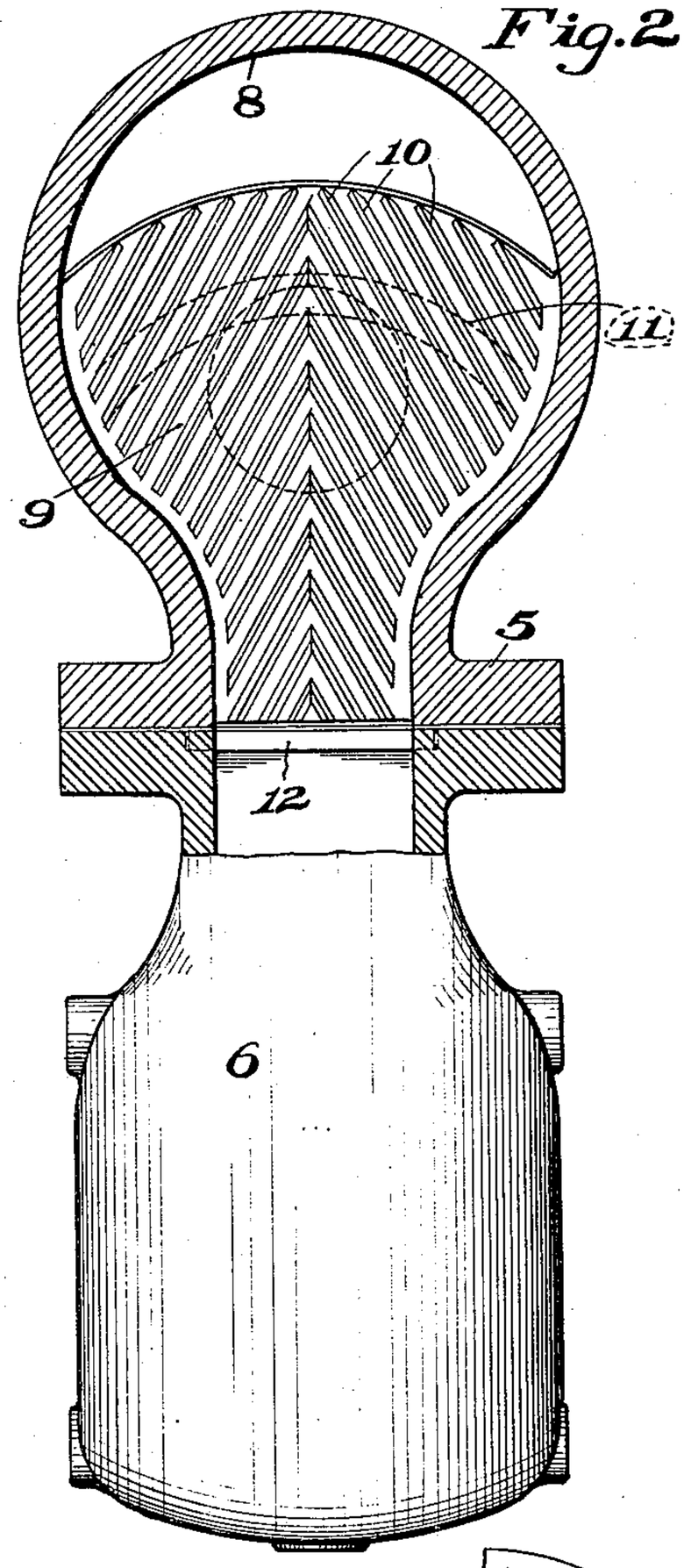


Fig. 3.

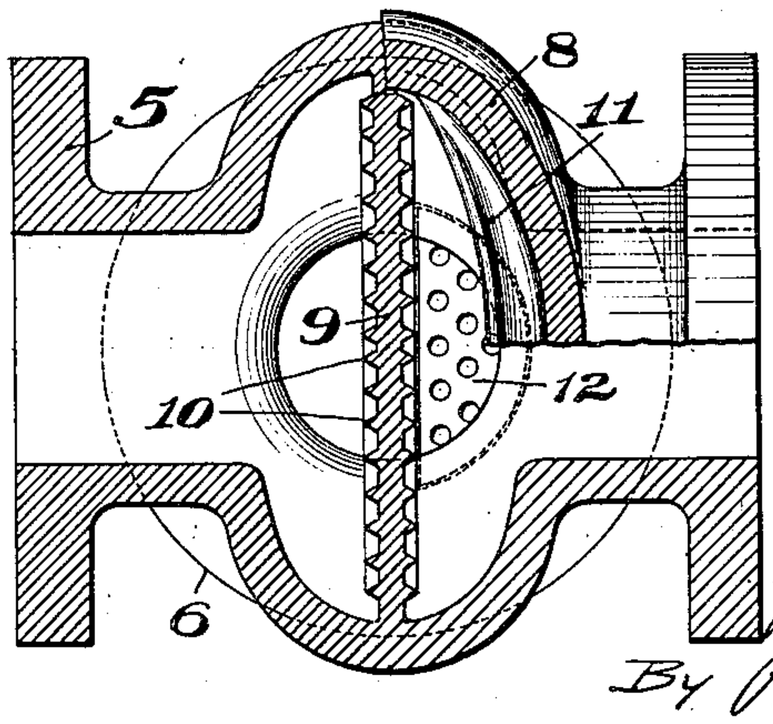
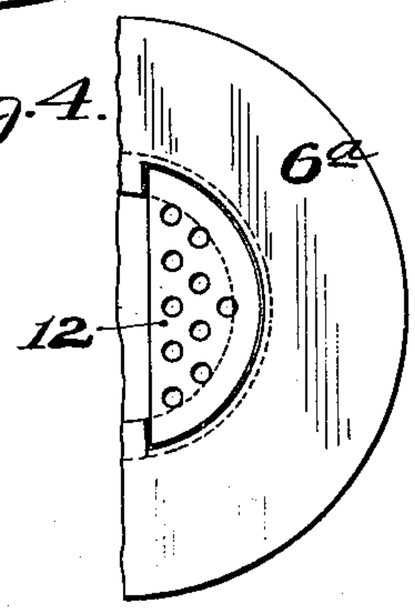


Fig. 4.



WITNESSES;

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UNITED STATES PATENT OFFICE.

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STEAM-SEPARATOR.

No. 868,156. Specification of Letters Patent. Patented Oct. 15, 1907.

Application filed February 7, 1905. Serial No. 244,616.

To all whom it may concern:

Be it known that I, JOHN B. BERRYMAN, a citizen of the United States, residing at Chicago, in the State of Illinois, have invented a certain new and useful Steam-Separator, of which the following is a specification.

My invention relates to means for separating suspended fluid from gaseous substances, such as the oil found in exhaust steam, and moisture in live steam, etc., and particularly to such mechanical separators as employ a baffle plate for deposit of globules of fluid thereon. The objects of the invention are, to provide a more efficient form of baffle plate mounted to remove the moisture without substantially restricting the steam passage; to provide a superior design of casing which exposes both sides of the baffle plate to the steam; to provide against the possibility of the escaping steam picking up the moisture after deposit; to provide for proper drainage of the casing itself, and to generally improve the structure and operation of baffle plate separators. These objects, together with other advantages hereinafter to appear, I attain by means of the construction illustrated in preferred form in the accompanying drawing, wherein—

Figure 1 is a vertical section through a separator designed for horizontal currents of steam according to my invention;

Figure 2 is a partial side elevation and partial vertical section taken through the separator at right angles to the plane of Figure 1;

Figure 3 is a horizontal section taken along the line (3, 3) in Figure 1, and

Figure 4 is a detail showing a plan view of the drainage plate at the top of the receiver.

The invention is of use with any apparatus where it is required to separate suspended fluid from flowing gases, but it is herein shown as particularly applied to use in separating the water in live steam before introducing it to the engine. It has been customary to use various zig-zag passages for the steam for these purposes, which greatly retard the flow, and also to use baffle plates which are exposed only on one side to the current of steam. The present construction makes use of both sides of the baffle plate, and avoids restriction of the passage of steam. From the drawings it will be seen that I have provided a receiver for the fluid, 6, on top of which is casing 5 communicating therewith and having a downwardly directed entrance opening 7, which communicates directly with the receiver by an easy slope as shown, and is provided with an upwardly extending dome 8 within which is placed the double faced baffle plate 9 having corrugations 10 thereon, which are set at an angle to the direction of the flow of steam, as appears in Figure 2. The casing is so formed that the incoming current of steam strikes the baffle plate in a downward direction, then rises and follows around the dome 8, and is again deflected against the other side of the baffle plate, when it escapes through the outlet. The dome 8 has a shelf or trough 11 formed therein at the point of the deflection of the steam, which serves to collect any moisture that is deposited on the upper face of the dome and drains naturally into the receiver 6. At the bottom of baffle plate 9 on the outlet side, the opening into the well 6 is somewhat restricted by the use of the perforated plate 12, which allows sufficient drainage but prevents the steam coming in contact with the water in the receiver. It is preferably set into the top of the casting 6, on the flange 6^a as shown in Figure 4.

The baffle plate may be cast integrally with the casing 5 when desired; it is preferably provided with diagonally running corrugations 10 which are placed in opposite directions on the two sides of the medial line. These corrugations are of sufficient slant to allow of easy drainage, but will serve to prevent the steam from picking up any of the globules of water deposited thereon.

It will be seen that in this construction the opening to the well on the inlet side is perfectly free and natural so that the condensed water following the lower walls of the inlet pipe may be discharged without obstruction into the well, and on the outlet side the opening to the well is restricted by the perforated plate, so that the water in the well is completely out of the current and cannot be picked up and carried forward by any action of the live steam. The design is such that the current of steam comes in full contact with both sides of the baffle plate, and yet the flow is not restricted, as the sectional area of the space around the dome 8 is greater than that of the pipe. By causing the incoming current of steam to be projected upon the baffle plate in a downward direction the steam will more readily free itself from water, and the whole area of the baffle plate will be available for separating purposes. This also prevents the possibility of water being driven forcibly from the incoming pipe and striking the baffle plate with danger of breaking it, or spraying the water so that it will be again taken up by the steam. It will be understood that the detraining effect upon the steam is much greater when driven over a surface corrugated at an angle to the current, than if the ribs were set in line with the flow. The various advantages of this construction will be readily apparent to those familiar with the art.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent, is the following:

1. A steam separator comprising a baffle plate, a dome shaped casing forming an open space above the baffle plate

and provided with downwardly directed inlet and outlet passages together with a ledge, 11, thereon, to drain the dome.

2. The combination with a double faced corrugated baffle plate, of a casing formed to direct steam above and on both sides of the same and having downwardly directed inlet and outlet passages.

3. The combination of a baffle plate having two sets of diagonal ribs thereon and a casing having downwardly directed inlet and outlet passages and adapted to direct steam on both sides of said baffle plate together with a drainage ledge on the casing adapted to carry off the water out of contact with the current of steam.

4. The combination with a two faced corrugated baffle plate, of a casing having a down-turned inlet and a passage above the baffle plate and adapted to direct steam on both sides of the plate, and means to drain water off to the sides on both the plate and the casing.

5. In a steam separator a baffle plate and a casing having a dome over the baffle plate and downwardly directed inlet and outlet passages, substantially as described.

6. A steam separator comprising in combination a casing provided with a downwardly directed inlet and an outlet passage, a baffle plate therein provided with corrugations upon the side adjacent the inlet passage, means for draining said casing, together with a receiver therefor and means located between said casing and receiver to prevent the escape of fluid from the receiver into the outlet opening of the casing.

7. A steam separator comprising in combination, an upright baffle plate, and a casing having a dome over the baffle plate and a downwardly directed inlet passage, substantially as described.

8. A steam separator comprising in combination, an upright baffle plate, and a casing formed to direct steam above and on both sides of the baffle plate, and having a downwardly directed inlet passage, said baffle plate being corrugated upon the side adjacent the inlet passage.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

JOHN B. BERRYMAN.

Witnesses:
PAUL CARPENTER,
ALBERT GRANT MILLER.