

April 3, 1956

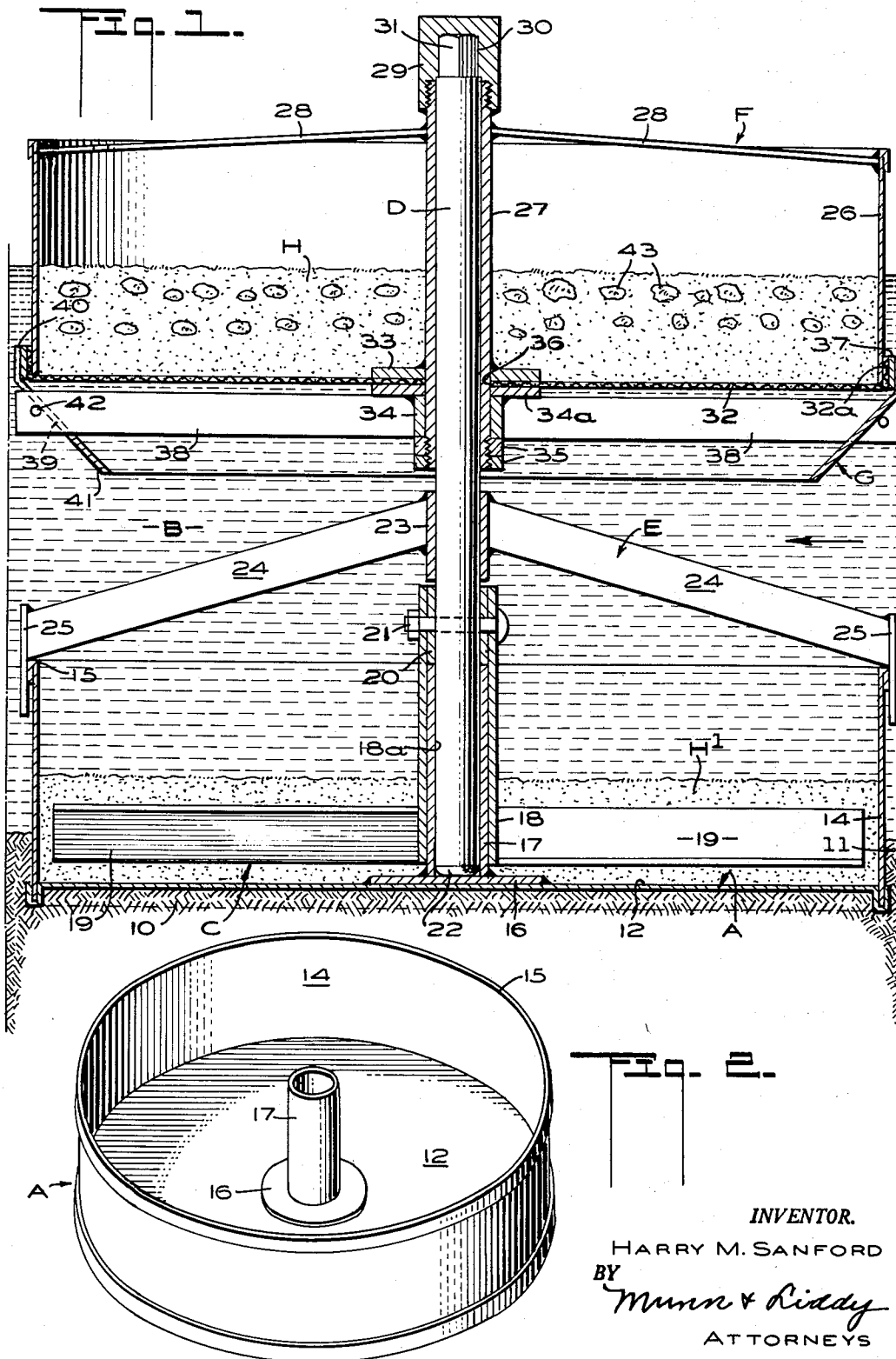
H. M. SANFORD

2,740,520

GOLD-RECOVERING APPARATUS

Filed Nov. 20, 1953

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 3.

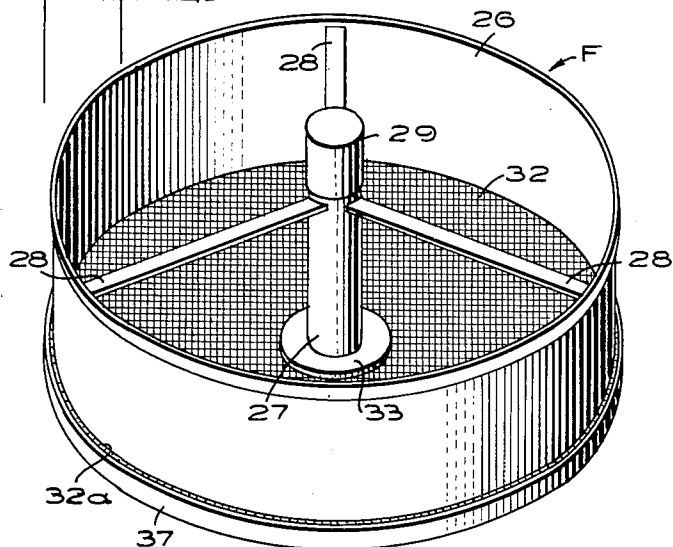
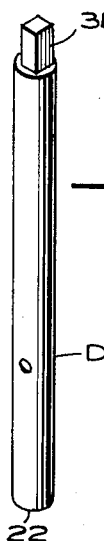


Fig. 6.

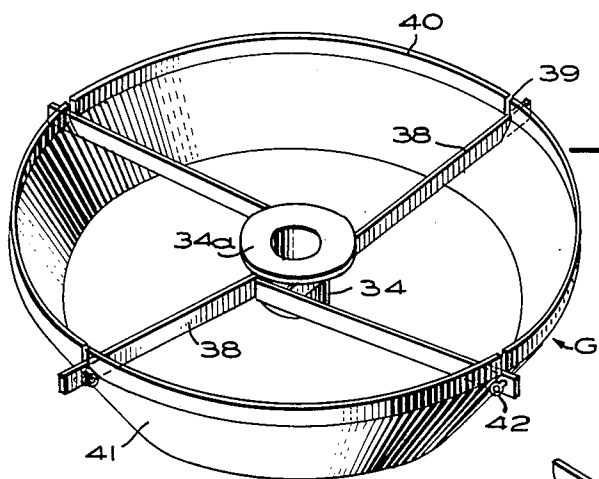


Fig. 4.

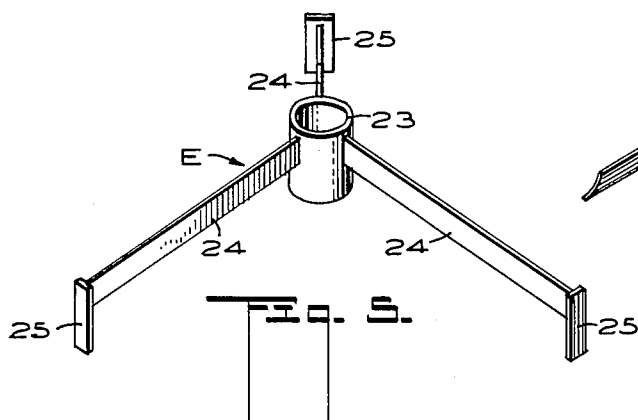


Fig. 5.

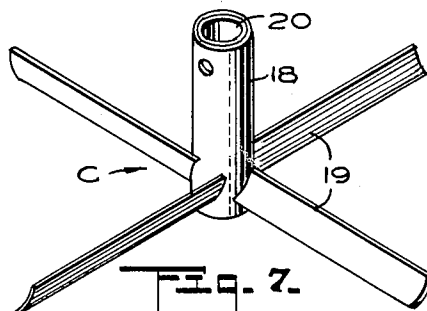


Fig. 7.

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GOLD-RECOVERING APPARATUS

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Application November 20, 1953, Serial No. 393,451

7 Claims. (Cl. 209—44)

The present invention relates to improvements in a gold-recovering apparatus. It consists of the combinations, construction, and arrangement of parts, as herein-after described and claimed.

For many decades it has been a common practice for miners to recover gold by shaking gold-bearing earth in a miner's pan, utilizing water to wash away the undesired dirt. It is well known in the art that such a pan is relatively shallow, and has an inclined annular rim over which the water is poured, thus carrying away the dirt and gravel, while retaining the precious ore in the pan. Of course, this type of recovering gold is rather laborious and time consuming.

Accordingly, the cardinal object of this invention is to produce a portable apparatus of rather simple construction, which may be utilized for recovering gold in a far more efficient manner than that provided by a conventional miner's pan. The apparatus is designed in such a way that it may be carried in a pack and readily assembled for mining operations.

Broadly speaking, I provide a pan that is adapted to be anchored in the bed of a stream or pond, entirely submerged in the water thereof. Moreover, a screening hopper is arranged above the pan in spaced relation therewith, into which the gold-bearing earth is placed. This hopper is at least partially immersed in the water. Gravel and larger particles of earth are separated out by the screen of the hopper, while the finer material gravitates downwardly into the pan.

In operation, a large part of the undesired dirt is washed away by the flowing water of the stream, which flows between the pan and hopper, while the remainder of the ore-bearing material descends into the pan. An agitation is provided in the pan for stirring the material contained therein so that the flowing water will wash out further dirt therefrom. The concentrates retained in the pan may be placed in a miner's pan so that the gold may be recovered.

Other objects and advantages will appear as the specification continues. The novel features will be set forth in the claims hereunto appended.

Drawings

For a better understanding of my invention, reference should be had to the accompanying drawings, in which:

Figure 1 is a vertical sectional view taken through my gold-recovering apparatus, showing it operatively installed in a stream of flowing water;

Figure 2 is a perspective view of the pan that is adapted to be anchored to the bed of the stream;

Figure 3 is a perspective view of the screening hopper into which the ore-bearing earth is shovelled;

Figure 4 is a perspective view of a funnel, which is utilized for directing the finer ore-containing dirt from the hopper towards the underlying pan;

Figure 5 is a perspective view of a brace that is adapted to engage over the marginal rim of the pan to provide a bearing support for an operating shaft disposed centrally of the hopper and pan;

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Figure 6 is a perspective view of the operating shaft by itself; and

Figure 7 is a perspective view of the agitator that is provided for stirring the material in the pan.

While I have shown only the preferred form of my invention, it should be understood that various changes, or modifications, may be made within the scope of the annexed claims without departing from the spirit thereof.

Detailed description

Referring to the drawings in detail, it will be noted that a pan A has been provided, which is adapted to be submerged in a body of water B, such as a stream, pond or river. This pan has been illustrated in Figure 1 as resting on and being anchored on the bed 10 of a stream by banking sand or gravel 11 around the bottom portion of the pan.

In its structural features, the pan A includes a bottom 12 having an upright annular wall 14 rising therefrom, the top of which defines a marginal rim 15. A reinforcing disc 16 is welded or otherwise secured to the bottom centrally thereof. This disc has a tubular standard 17 fixed thereto to extend vertically upwards. It will be apparent that the water B will fill any unoccupied space of the pan.

For the purpose hereinafter described, an agitator C is removably disposed in the pan A. It has a hub 18 adapted to be telescoped over the standard 17. A series of inclined blades 19 extend radially from the hub 18, and are supported slightly above the bottom 12 of the pan. Moreover, a bearing 20 is fixed to the upper interior of the hub 18 so as to rest on the top of the standard 17 to thus limit downward movement of the agitator towards the bottom of the pan. The blades 19 extend to positions adjacent to the annular wall 14, as shown in Figure 1 of the drawings.

The agitator C is adapted to be rocked back and forth, or rotated, by means of an operating shaft D, the latter being made for introduction through the bearing 20 so as to extend downwardly through the hub 18. As disclosed in Figure 1, a bolt 21 is provided for insertion through aligned openings in the hub 18, bearing 20 and shaft D for removably securing the agitator to the shaft. When this hub is telescoped over the tubular standard 17, the lower part of the shaft D is received in the bore 18a of the standard, as illustrated in Figure 1. At this time, the lower end 22 of the shaft may rest on the disc 16 to give further bearing support for the shaft.

After the agitator C and the operating shaft D have been assembled on the tubular standard 17 (see Figure 1), a brace E is applied to steady the shaft. This brace has a bearing sleeve 23, which is adapted to slide over the operating shaft D. It will be observed that a plurality of arms 24 are attached to the sleeve 23, and extend outwardly and downwardly therefrom so as to rest on the marginal rim 15 of the pan A. Vertically-disposed feet 25 are provided at the outer ends of the arms 24 to slide over the rim of the annular wall 14 to thus prevent the brace E from shifting laterally, and thereby provide a firm bearing support for the operating shaft.

As clearly shown in Figure 1, a hopper F is mounted on the upper portion of the shaft D. It includes an upright cylindrical wall 26 extending concentrically around an axially-disposed hub 27, the latter being made for being removably telescoped over the shaft D from above. A series of braces 28 have their outer and inner ends welded or otherwise secured to the cylindrical wall 26 and the hub 27, respectively.

The top of the hub 27 has a cap 29 fixed thereto, which is fashioned with a square bore 30 on its interior. This bore is dimensioned for telescoping over a squared upper end 31 of the shaft D, thereby interconnecting the

latter to the hopper. In actual use, the miner grasps the braces 28 and utilizes them as handles in oscillating or rotating the hopper F and thereby imparting corresponding movement to the agitator C.

In its further details, the hopper has a screen 32 of suitable mesh at its bottom. The central portion of this screen abuts a washer 33 fixed to the hub 27 above the screen. The hub projects below the screen, as shown in Figure 1, and has a flanged sleeve 34 secured thereto by lock nuts 35. The washer-like flange 34^a on this sleeve bears against the screen from below. The screen has a central opening 36 therein for receiving the hub 27. The marginal portion 32^a of the screen is turned up over the lower outer periphery of the cylindrical wall 26, and is clamped to the latter by an annular band 37, which telescopes over the up-turned part of the screen.

As illustrated in Figures 1 and 4, a funnel G is mounted below the screen, and is supported in position by arms 38 fixed to the flanged sleeve 34. These arms extend through notches 39 extending downward in the annular rim 40 and the conical wall 41 of the funnel. This rim of the funnel telescopes over the band 37 from below. Cotter pins 42, or the like, extend through the outer ends of the arms 38 and bear against the outer surface of the conical wall 41 to hold the funnel in place.

Thus the funnel G is caused to oscillate or rotate with the hopper. As material passes through the screen 32, it is directed inwardly relative to the annular wall 14 of the pan A, thus assuring the precious ore being discharged into the pan.

Particular attention is called to the fact that the hopper F and its funnel G are spaced above the pan A to allow flow of the water B therebetween. Thus much of the undesired dirt is washed away by the water flowing through this space, while the heavier particles of ore gravitate into the interior of the pan.

In assembling the hopper F and funnel G into a unitary structure, the lower end of the hub 27 is inserted through the opening 36 in the screen 32 until the latter abuts the washer 33. Then the flanged sleeve 34 is telescoped over the bottom section of this hub, and its flange 34^a brought up against the screen. Now the lock nuts 35 are screwed onto the hub. Thereafter the upturned marginal portion 32^a of the screen is clamped against the upright cylindrical wall 26 of the hopper by applying the annular band 37.

As the next step, the funnel G is moved toward the screen, with its slots 39 receiving the spider-like arms 38. The annular rim 40 of the funnel is telescoped over the band 37 from below, and then the cotter pins 42 are inserted through openings in the outer ends of these arms, with the pins bearing against the conical wall 41 of the funnel. Normally, the hopper and funnel remain together, when the apparatus is taken apart for transporting. However, it is quite apparent that the screen may be removed and replaced by a new one, when required.

Summary of assembling and operation

All of the component parts of the gold-recovering apparatus may be conveniently carried by a miner to the location where it is to be utilized, even over rugged terrain.

In assembling the apparatus for a mining operation, the agitator C is secured to the shaft D by inserting the latter into the hub 18, and thereafter applying the bolt 21 to anchor this hub to the shaft, as shown in Figure 1. Now the hub 18 is telescoped downwardly over the tubular standard 17 until the bearing 20 comes to rest on top of the standard.

As the next step, the bearing sleeve 23 of the brace E is lowered over the shaft D, and its feet 25 are engaged over the outer surface of the marginal rim 15 of the pan A. This will give adequate support for the operating shaft.

Thereafter the assembled hopper-screen unit F—G is lowered over the shaft D, with the latter extending up-

wardly through the bore of the hub 27 until the square (or other noncircular) upper end 31 of the shaft fits into the square bore 30 of the cap 29, which is permanently fixed to the hub 27.

The assembled apparatus is placed in the body of water B, with the pan A resting on the bed 10 of the pond, river or stream. A bank of sand or gravel 11 may be placed around the lower part of the pan to hold the latter in place. The depth of the body of water B should be sufficiently deep so that it will pass through the screen and enter the hopper F.

In carrying out the operation, the miner places a desired amount of gold-bearing earth H in the hopper F. The water will commence dissolving in the dirt, and the mud therefrom will be carried away by the flowing water. The miner grasps the handle-like braces 28, and oscillates the hopper back and forth, occasionally giving the hopper a complete turn.

The coarser particles 43, such as gravel, will be screened out and may be removed from the hopper. The finer material, including the gold, will pass through the screen and be directed by the funnel G toward the pan A. Inasmuch as the water B is flowing through the space between the hopper and the pan, a considerable portion of the dirt will be carried away by the stream.

In Figure 1, the part H¹ of the gold-bearing earth that reaches the interior of the pan will be stirred by the agitator, as the hopper F is oscillated or rotated. This will cause the stream of water to carry away additional mud.

When the process has been carried to a point where a small amount of foreign matter still remains mixed with the gold, this concentrate may be placed in a miner's pan, and the gold separated out in the usual manner.

I claim:

1. In a gold-recovering apparatus: a pan adapted to be positioned on the bed of a stream, or the like; the pan including an upright annular wall around which material of the stream bed may be banked to hold the pan stationary; a hopper arranged in spaced relation above the pan to provide a passageway therebetween through which water of the stream may flow; the hopper including a screen bottom through which gold-bearing earth may gravitate from the hopper towards the pan; an agitator mounted in the pan for rotation relative to the stationary pan to thereby stir the material descending into the pan; and means operable for turning the agitator.

2. In a gold-recovering apparatus: a pan adapted to be positioned on the bed of a stream, or the like; a substantially upright operating shaft rotatably supported by the pan to extend thereabove; a hopper secured to the shaft to turn the latter when the hopper is turned; the hopper being arranged in spaced relation above the pan to provide a passageway therebetween through which water of the stream may flow; the hopper including a screen bottom through which gold-bearing earth may gravitate from the hopper towards the pan; an agitator secured to the shaft to turn therewith; this agitator being mounted in the pan for stirring material descending thereinto; and a brace interposed between the pan and the hopper; this brace defining arms having feet removably engaging over a marginal rim of the pan; the brace including a bearing sleeve removably telescoped over the shaft to support the latter.

3. In a gold-recovering apparatus: a pan adapted to be positioned on the bed of a stream, or the like; a substantially upright tubular standard secured to the pan centrally thereof; an agitator having a hub telescoped relative to the standard; the agitator including blades attached to the hub to stir material in the pan; an operating shaft journaled in the tubular standard; means removably securing the agitator hub to the shaft so that both will turn as a unit; a hopper supported on the shaft in spaced relation above the pan, thereby providing a passageway through which water of the stream may flow; the hopper including a screen bottom through which gold-

bearing earth may gravitate towards the pan; and means removably securing the hopper to the shaft to turn the shaft and agitator when the hopper is turned.

4. In a gold-recovering apparatus: a pan adapted to be positioned on the bed of a stream, or the like; a substantially upright tubular standard secured to the pan centrally thereof; an agitator having a hub telescoped relative to the standard; the agitator including blades attached to the hub to stir material in the pan; an operating shaft journaled in the tubular standard; means removably securing the agitator hub to the shaft so that both will turn as a unit; a hopper supported on the shaft in spaced relation above the pan, thereby providing a passageway through which water of the stream may flow; the hopper including a screen bottom through which gold-bearing earth may gravitate towards the pan; means removably securing the hopper to the shaft to turn the shaft and agitator when the hopper is turned; the hopper including a hub removably telescoped over the shaft, and also including an annular wall; and braces having their inner and outer ends secured to the hopper hub and the annular wall of the hopper, respectively; these braces being exposed for manual grasping by a miner for turning the hopper.

5. In a gold-recovering apparatus: a pan adapted to be positioned on the bed of a stream, or the like; a substantially upright tubular standard secured to the pan centrally thereof; an agitator having a hub telescoped relative to the standard; the agitator including blades attached to the hub to stir material in the pan; an operating shaft journaled in the tubular standard; means removably securing the agitator hub to the shaft so that both will turn as a unit; a hopper supported on the shaft in spaced relation above the pan, thereby providing a passageway through which water of the stream may flow; the hopper including a screen bottom through which gold-bearing earth may gravitate towards the pan; means removably securing the hopper to the shaft to turn the shaft and agitator when the hopper is turned; and a brace interposed between the pan and the hopper; this brace defining arms having feet removably engaging over a marginal rim of the pan; the brace including a bearing sleeve removably telescoped over the shaft to support the latter.

6. In a gold-recovering apparatus: a hopper-funnel assembly comprising: a hopper defining an upright cylindrical wall extending concentrically around an axially-disposed hub; hand-grasping braces having their outer and inner ends secured to the cylindrical wall and the hub, respectively; a screen extending across the cylindrical wall at the bottom of the latter; a washer fixed to the hub above the screen, with the screen abutting this

washer; the hub projecting through an opening in the screen to a position below the screen; a flanged sleeve removably secured to the hub and bearing against the screen from below; the marginal portion of the screen being upturned over the lower outer periphery of the cylindrical wall, and being clamped to the latter by an annular band; a conical-shaped funnel having an annular top portion telescoped over the annular band from below; the funnel defining a conical wall converging downwardly and inwardly towards the extended axis of the cylindrical wall of the hopper; arms secured to the flanged sleeve of the hub and being disposed below the screen; and means removably supporting the funnel on these arms.

7. In a gold-recovering apparatus: a hopper-funnel assembly comprising: a hopper defining an upright cylindrical wall extending concentrically around an axially-disposed hub; hand-grasping braces having their outer and inner ends secured to the cylindrical wall and the hub, respectively; a screen extending across the cylindrical wall at the bottom of the latter; a washer fixed to the hub above the screen, with the screen abutting this washer; the hub projecting through an opening in the screen to a position below the screen; a flanged sleeve removably secured to the hub and bearing against the screen from below; the marginal portion of the screen being turned over the lower outer periphery of the cylindrical wall, and being clamped to the latter by an annular band; a conical-shaped funnel having an annular top portion telescoped over the annular band from below; the funnel defining a conical wall converging downwardly and inwardly towards the extended axis of the cylindrical wall of the hopper; the funnel having notches therein extending downwardly in the annular top portion and into the conical wall thereof; arms secured to the flanged sleeve of the hub, and being disposed below the screen; the arms having outer sections extending through said notches to positions beyond the conical wall of the funnel; and means removably secured to the outer sections of the arms and bearing against the exterior surface of the conical wall to support the funnel on these arms.

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