May 24, 1932. F. SIEVERN ET AL 1,859,606

OIL SAVING DOME

Filed April 9, 1931

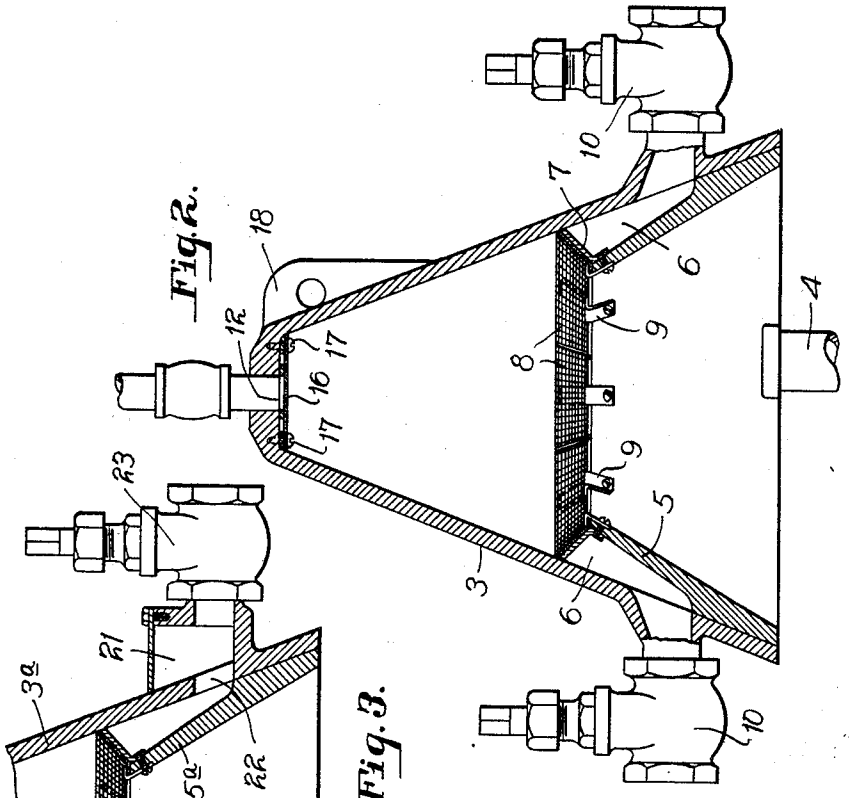


Fig. 2.

Fig. 3.

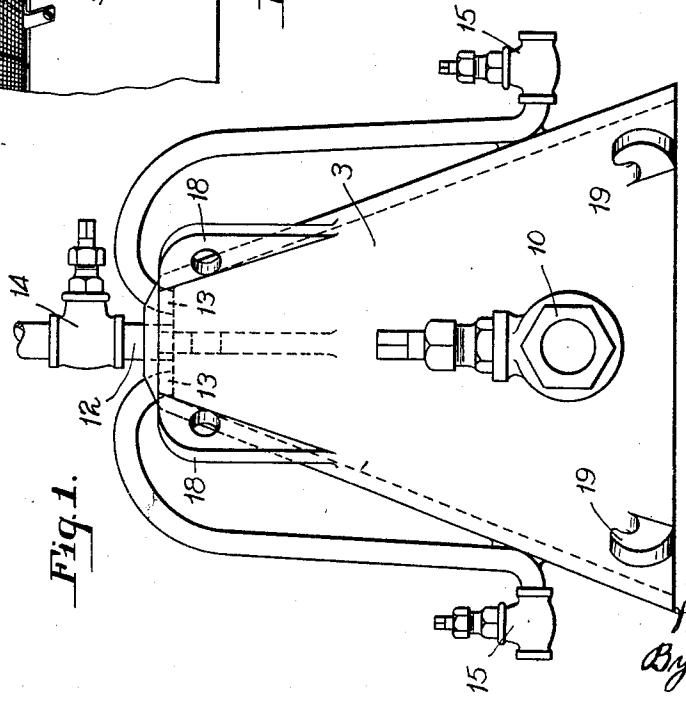


Fig. 1.

INVENTORS
Fredrick Sievern
Edward M. Lynch,
By Archworth & Martin,
Attorneys.

Patented May 24, 1932

1,859,606

UNITED STATES PATENT OFFICE

FREDRICK SIEVERN AND EDWARD M. LYNCH, OF McKEESPORT, PENNSYLVANIA

OIL SAVING DOME

Application filed April 9, 1931. Serial No. 528,740.

Our invention relates to domes for use in connection with oil and gas wells to effect a saving of oil and gas preliminary to the capping of the well or the connection thereof to a pipe line, and for the purpose of extinguishing burning wells.

One object of our invention is to provide a dome that can be readily placed in position above a gushing well and which will deflect oil into the pipe lines instead of permitting it to flow along the ground.

Another object of our invention is to porvide an oil-saving dome having an improved means for screening or straining the oil to prevent gravel from being directed into the lines with which the dome is connected.

Still another object of our invention is to provide a dome of generally simplified and improved form, and possessing various advantages not found in domes of the prior art.

In the accompanying drawings, Figure 1 is an elevational view of our dome; Fig. 2 is a sectional view thereof, taken at right angles to the view of Fig. 1, and Fig. 3 is a fragmentary view showing a modification.

The dome comprises a body portion 3 of hood-like form that is adapted to be placed upon or adjacent to the surface of the ground, over the end of a well casing 4. The dome is particularly designed for use where the pressures are very great and difficulty is experienced in confining the oil or gas issuing from the casing 4, and may weight as much as five thousand pounds or more, depending upon the pressure conditions and the size of the well with which the dome is to be employed.

In its lower portion, the dome has secured thereto a circular flange or partition plate 5 that is of truncated conical form and provides an annular space 6 between the body portion of the dome and the partition 5. Ribs 7 extend from the upper edge of the partition 5 to the dome wall and serve to support screen plates or grid plates 8 that are of segmental form and are removable. Clips 9 overlie the lower edges of the screen plates 8 and hold them securely in position. The screen plates are inclined away from the center of the dome and lie out of the direct path of liquid issuing from the pipe 4, so that such screens will not be damaged by gravel that is carried by the oil or gas issuing from the pipe 4. However, oil which enters the dome 3 may flow through the screen to outlets that are controlled by valves 10, which may be in turn connected to oil lines. The gravel contained in the oil will slide from the screen 8 to the ground, out of the path of the flowing oil.

The dome in its upper end has a central opening 12 and openings 13 disposed at either side thereof, all controlled by suitable valves 14 and 15. The openings 12 and 13 are covered by a screen 16 that is detachably held in place by means of screws 17, so that it can be readily replaced, since it will frequently be subjected to the impact of gravel and sand.

In bringing the dome into service, it is supported by suitable suspending means which engage openings in ears 18 thereof so that it can be lowered over the end of a well casing 4. If the pressure of flow from the well is extremely high, it may not be feasible to lower the dome immediately into contact with the ground, but nevertheless a large portion of the oil will be saved because it can be caused to flow through the outlets 6, 12, and 13, the outlets 6 serving to catch substantially all of the oil which is not discharged through the openings 12 and 13. The saving is much greater than if outlets were provided only in the upper part of the casing and the outlet space 6 elminiated. The dome may be anchored to the ground by attaching guy lines or the like to hooks 19 distributed around the lower edge of the dome. In this manner, the dome could be either held in a stationary position above the well casing or gradually drawn downward into contact with the ground, to more effectively confine the oil or gas, and thereby reduce waste. Furthermore, the dome could be used to extinguish burning wells.

In those cases where the well is discharging a mixture of gas and oil or gas containing considerable quantities of gasoline, the major portion of the gas will be discharged through the outlets in the top of the dome, while the liquid content will tend to collect and flow

into the outlet space 6, thereby effecting a separation of the gas and liquid.

In placing the dome in position, the valves 10, 14 and 15 will ordinarily be opened to reduce pressure within the dome and when the dome has been secured at a desired location with respect to the well, oil and gas may discharge through the valves to pipe lines, or certain of the valves may be closed to cause discharge from the dome through only the valves which still remain open.

It will, of course, be understood that some of the openings may be eliminated, such for example, as the openings 13 or the opening 12, particularly if the remaining opening or openings be made larger than shown on the drawings.

If the well pressure is not excessively great, the dome can be set directly on the ground or on a platform surrounding the top of the casing, and all of the oil issuing from the casing will be saved, while in many cases nearly all of the oil will be saved even though the dome is not brought into engagement with the surface surrounding the well casing.

In Fig. 3, we show a fragmentary view of a dome 3^a having a partition 5^a that corresponds to the partition 5 of Fig. 2. A reservoir 21 is formed exteriorly of the dome and has communication through openings 22 with the reservoir space between the partition 5^a and the dome wall. One or more valves 23 is provided to control flow from the reservoir space 21 to a pipe line. The reservoir 21 provides additional capacity for collecting and saving oil, particularly since a large number of openings 22 are provided so that there will be freer flow from the interior reservoir space than if only a few valve openings were provided instead of the passages 22. The domes will ordinarily be made of very great size, and each of the reservoir spaces will be of sufficient area to hold a number of barrels of oil.

We claim as our invention:—

1. A dome of generally conical form having an annular partition disposed interiorly thereof and an outlet communicating with the space surrounding said partition, and an upwardly inclined screen bridging the space between the upper edge of the partition and the wall of the dome.

2. A dome of generally conical form having an annular partition of truncated conical form disposed interiorly thereof and an outlet communicating with the space surrounding said partition, and a screen bridging the space between the upper edge of the partition and the wall of the dome, the said screen being inclined upwardly in a direction away from the center of the dome.

3. A dome for use in connection with oil wells and the like, having an annular internal partition inclined inwardly and upwardly relative to the adjacent wall of the dome, the smallest diameter of said partition being of large dimension relative to the diameter of the well, and the upper portion of the dome being of reduced diameter relative to the first-named diameter, and the dome being provided with an outlet through its side, at a point opposite to said partition.

4. A dome for use in connection with oil wells and the like, having an annular internal partition inclined inwardly and upwardly relative to the adjacent wall of the dome, the smallest diameter of said partition being of large dimension relative to the diameter of the well, and the upper portion of the dome being of reduced diameter relative to the first-named diameter, and the dome being provided with an outlet through its side at a point opposite to said partition and with an outlet in the top thereof.

5. A dome having an annular partition of truncated conical form disposed interiorly thereof, that portion of the dome above the partition being of generally conical form and having an outlet in its upper portion, the partition being of low height relative to the height of the dome and having its uppermost diameter greater than the diameter at the uppermost part of the dome, and the dome being provided with an outlet through its side at a point opposite to said position.

6. A dome having an annular partition of truncated conical form disposed interiorly thereof, that portion of the dome above the partition being of generally conical form and having an outlet in its upper portion, the partition being of low height relative to the height of the dome, and its wall being of greater angularity with respect to the axis of the dome than is the wall of the dome, and the dome being provided with an outlet through its side at a point opposite to said partition.

In testimony whereof we, the said FREDRICK SIEVERN and EDWARD M. LYNCH, have hereunto set our hands.

FREDRICK SIEVERN.
EDWARD M. LYNCH.