

May 18, 1926.

G. L. BANKS

1,585,072

AUTOMATIC CRUDE OIL SAMPLER

Filed Nov. 16, 1923

Fig. 5

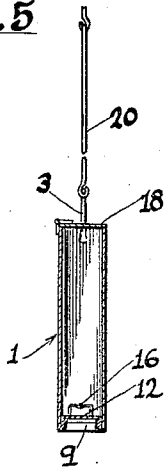


Fig. 6

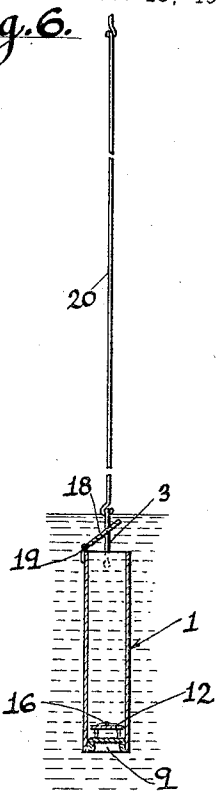


Fig. 7

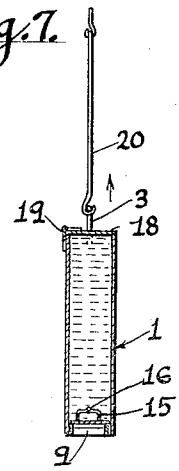


Fig. 1

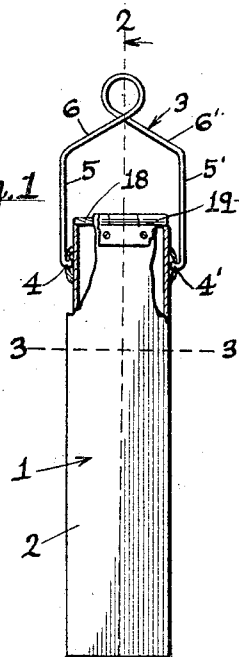


Fig. 2

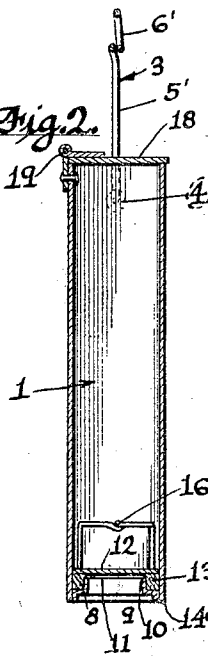


Fig. 4

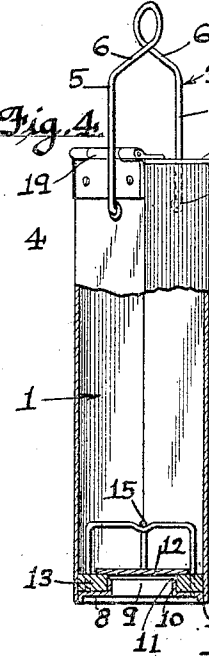
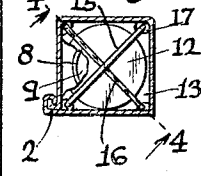


Fig. 3



Witness

Inventor:
G. L. BANKS.
Attorneys:

UNITED STATES PATENT OFFICE.

GEORGE L. BANKS, OF LOS ANGELES, CALIFORNIA.

AUTOMATIC CRUDE-OIL SAMPLER.

Application filed November 16, 1923. Serial No. 675,133.

My present invention being referred to as a crude oil sampler, it should be understood that this invention relates to what is commonly termed an "oil thief", this being a receptacular device intended to be dropped to any desired level within an oil tank, or any container to sample the oil at the level referred to, the bottom of the "thief" being then closed in advance of its withdrawal. As soon as a sample is brought to the surface, its specific gravity and temperature may be simultaneously taken; and it is an object of this invention to provide simple means for facilitating not only the taking of a sample but the ascertainment of its specific gravity and temperature.

It being a defect of certain samplers now in use that they require the manipulation of a second rope, additional to that by which the "thief" is raised and lowered, these or other samplers being sometimes provided with an unduly constricted opening at the top thereof or with an unduly complicated bottom closure, it is an object of this invention to provide a "thief" adapted to descend to any desired level within a column of oil, remaining automatically open during the period of its descent, in such manner as to permit oil to pass continuously there-through; and in a preferred construction of my novel "thief", I may provide the same with a bottom closure and optionally also with a top closure, adapted automatically to close as soon as the descent of the "thief" may be discontinued, thereby taking a sample of the oil in which it may then be suspended, the elevation of the "thief" being then effective to retain the sample taken, and the top opening of my "thief" being of such diameter as to permit the prompt insertion of a gravity bulb and a thermometer, before the sample shall have undergone any appreciable change, due to cooling or to the evaporation of volatile constituents, or to other causes.

As implied above, it is an object of this invention to provide a "thief", preferably having a substantially cylindrical or prismatic body, such as a rectangular body, with comparatively large bottom and top openings, the bottom opening being provided with means reliably to effect a closing under the action of gravity, whenever a "thief" is brought to a stop within a body of oil, and the top being preferably provided with an

upwardly opening flap or cover pivoted in such manner as to be engageable by a bail by which my "thief" may be raised or lowered, the contacting of the top cover with the bail being advantageous as limiting the upward movement of the former element and thereby assuring a prompt closing, under the action of gravity or the downward pressure of oil through which my "thief" may be elevated.

It is a further object of my invention to provide suitable means, preferably comprising a pair of crossed wires or rods secured to a bottom plate, for retaining a bottom closure plate; and, in a preferred embodiment of my invention, the mentioned plate may be provided with a cooperating gasket, through which the mentioned wires or rods may extend, in a manner contributing to the retention of said gasket, it being, however, understood that the use of a gasket and the use of a top closure, and the specific character of the retaining means for the mentioned closure plate, as well as the dimensions and configuration of the body of my "thief" are optional and comparatively immaterial to my present invention, the most essential feature of which is the provision of an elongated body adapted to be automatically opened and closed in the manner referred to, and under the control of a single rope or other flexible supporting element by which it may be lowered and withdrawn.

Other objects of my invention will appear from the following description of a preferred embodiment thereof, and from the appended claims, taken in connection with the accompanying drawings, in which:

Figure 1 may be regarded as a rear elevation of my novel "thief", with parts broken away.

Fig. 2 may be regarded as a sectional view on a plane such as is indicated by the line 2—2 of Figure 1.

Fig. 3 may be regarded as a horizontal section on the line 3—3 of Figure 1, with parts broken away.

Fig. 4 is an additional elevational view, with parts broken away to the plane indicated by the line 4—4 of Figure 3.

Fig. 5 is a diagrammatic general view indicating the relative positions of the parts of my novel "thief" during the descent thereof but before it has come in contact with the oil within an oil tank or container.

Fig. 6 is a similar view, showing the automatic opening of the top and bottom, to permit a relative flow of oil through my novel "thief", during its descent to the level at which a sample is to be taken.

Fig. 7 is a similar view, showing my novel "thief", with its top and bottom closed, during the elevation thereof to the surface of the ground.

Referring to the details of that specific embodiment of my invention which I have chosen for purposes of illustration, I may be a substantially rectangular body of an oil "thief", which may be formed of sheet metal, shown as closed upon itself by folding in a known manner along a longitudinal edge 2, and as provided with a bail 3, pivoted thereto in a known manner at 4, 4', the parallel elements 5, 5' of the mentioned bail being shown as connected by diagonal portions 6, 6' with a loop or eye, adapted to receive a hook or other fastening means on the end of a rope or other flexible supporting element by which my "thief" may be lowered into an oil well, or container, or drawn therefrom.

It being intended that my "thief" shall automatically permit a free movement of oil through its interior during descent to a desired level within a column of oil, the bottom plate 8 of my novel "thief" is shown as provided with an extensive opening 9, shown as bonded by a substantially circular collar or rim 10, which is preferably perfectly flat at its upper edge 11, which may optionally contact directly with a cooperating plate 12, whose lower surface need not be convex, and which may optionally contact with a suitable packing 13, rather than with the upper edge of the collar 10, it being understood that the bottom element 8 may be secured in any suitable way, as by riveting or soldering at 14, to the vertical walls of the main body 1 of my novel "thief".

In order to prevent accidental displacement of the bottom closure plate 11, I may employ any suitable internal restraining means such as a cage formed of the crossed wires 15, 16, shown as bent downward and secured to the bottom element 8, the packing 13 being preferably cut to conform to the configuration of the lateral walls with which this element may contact and being shown as provided at its corners with slits 17, through which the crossed restraining elements 15, 16, may extend, in a manner contributing to the retention of the packing in its seat, and preventing accidental displacement thereof.

Although it is not absolutely necessary to provide my novel "thief" with a cover, I consider it advantageous to provide the same with a flat closure element such as is shown at 18, this cover being shown as pivotally secured by means of a hinge 19, and the

comparative dimensions of the cover 18 and the bail 3 being preferably such that, when the said bail is held upright by the suspension of my "thief" upon a rope 20, or the equivalent, the upward movement of the cover 18 may be limited by a contact of the corners thereof with the diagonal elements 6, 6' of the said bail, the relationships here referred to being advantageous as preventing the said cover from opening to an undue extent, or to such an extent as to prevent its closing promptly whenever my "thief" is brought to a stop within a column of oil.

From the foregoing description it is believed that a preferred construction and mode of operation of my novel "thief" will be readily understood, and that it will be apparent that although my "thief" may quickly descend to any desired level within an oil body, oil being permitted to pass freely through it during its descent through the oil, as soon as my "thief" is brought to a stop, both the bottom and the top closures will automatically seat themselves and will remain seated during the elevation of my "thief" to the surface of the ground, then permitting the top closure to be thrown wide open and a hydrometer and a thermometer, or other desired instruments, to be promptly inserted for the taking of any desired observations—it being an important advantage of my "thief" that, notwithstanding the simplicity of its construction, it is entirely reliable and automatic in its operation, comprising no complex valve mechanism, and requiring no manipulation of separate ropes for the control of the closure elements, such as has heretofore been a source of error and inconvenience and expense in the taking of samples of crude oil.

Although I have herein described but one complete embodiment of my invention, it will be understood that various features thereof might be independently employed, and also that various modifications might be made therein without departure from the spirit and scope of my invention, as the same is indicated above and in the following claims.

What I claim is:

1. In an oil "thief", a tubular receptacle, a bail secured to the top of the receptacle, and a top closure hinged to the receptacle, said bail and top closure being so arranged that the opening movement of the top closure will be limited by the bail.
2. In an oil "thief", a tubular receptacle, a bail hinged to the top of the receptacle, and a top closure hinged to the receptacle, said bail and top closure being so arranged that the opening movement of the top closure will be limited by the bail.
3. In an oil "thief", a tubular receptacle having a bottom in which is formed an aperture, an upstanding flange about the aper-

ture, packing disposed between said flange and the walls of the receptacle, a closure adapted to seat on top of said packing, and a cage mounted within the receptacle and surrounding the closure for maintaining the closure adjacent said packing.

4. In an oil "thief", a tubular receptacle having a bottom in which is formed an aperture, an upstanding flange about the aperture, packing disposed between said flange and the walls of the receptacle, a closure adapted to seat on top of said packing, and a cage mounted within the receptacle for maintaining the closure adjacent said packing, said cage consisting of ele-

ments secured to the bottom of the receptacle.

5. In an oil "thief", a tubular receptacle having a bottom in which is formed an aperture, an upstanding flange about the aperture, packing disposed between said flange and the walls of the receptacle, a flat closure plate adapted to seat on top of said packing to close said aperture, and a cage consisting of crossed elements secured to the bottom for maintaining the plate adjacent said packing.

In testimony whereof I have signed my name to this specification.

GEO. L. BANKS.