Feb. 4, 1964 H. R. THOMPSON 3,120,260

WASTE GAS DISPOSAL FLARE

Filed Feb. 26, 1960

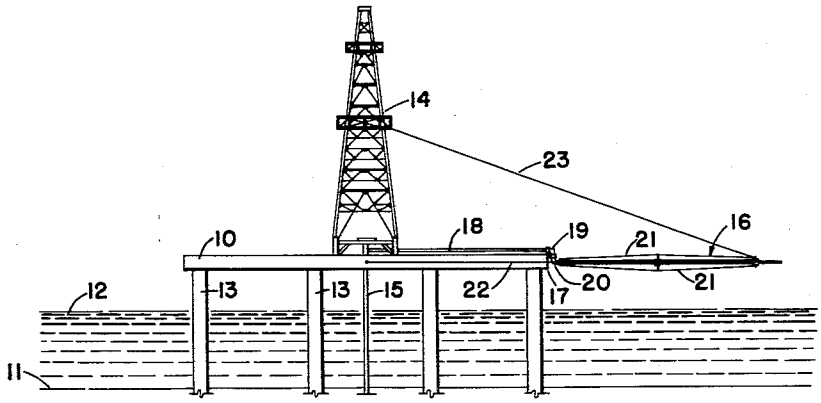


FIG. 1

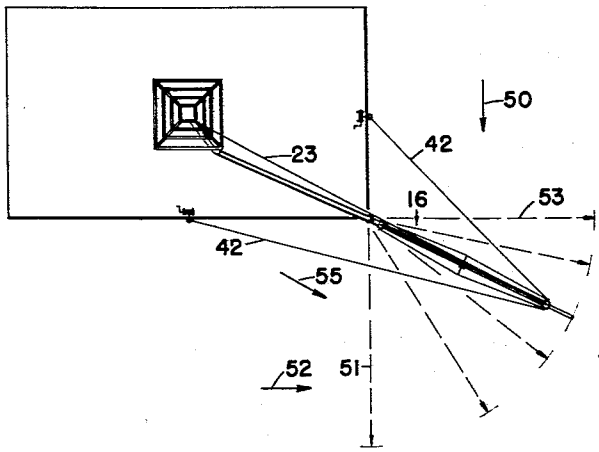


FIG. 3

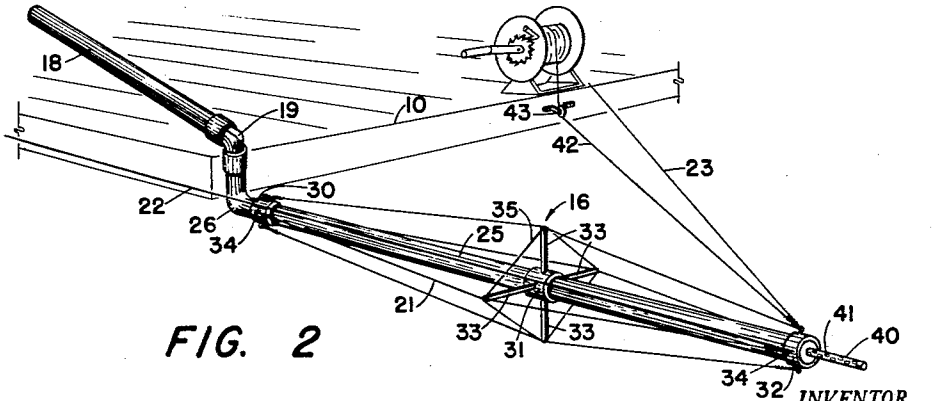


FIG. 2

INVENTOR.
HUGH R. THOMPSON
BY William J. Miller
ATTORNEY

United States Patent Office 3,120,260 Patented Feb. 4, 1964

3,120,260
WASTE GAS DISPOSAL FLARE

Hugh R. Thompson, New Orleans, La., assignor to Continental Oil Company, Ponca City, Okla., a corporation of Delaware

Filed Feb. 26, 1960, Ser. No. 11,196
2 Claims. (Cl. 158—99)

This invention relates to an improved waste gas burner for use in installations surrounded by water such as an off-shore drilling platform.

The drilling and production efforts involved in the removal of hydrocarbons necessarily results in the production of certain gaseous matter which is caused to be undesirable. The disposition of undesirable gaseous matter may be more readily affected by installations at or near the site of the drilling platform. The conventional method of disposal is to expend the gas into a flare or waste gas burner which is located a sufficient distance from the drilling rig so that it will not constitute a hazard during the hydrocarbon production. However, when the drilling platform is situated in a water saturated or water surrounded area, installation and maintenance of the waste gas burner becomes a complex and expensive problem. In prior devices, removal of the waste gas burner from the near proximity of the drilling platform required that the burner be mounted in the water. This method of mounting the burner, however, required that the foundation be placed on the bed of the body of water. The burner was then mounted upon the foundation and piping was placed under water along the bed of the water from the platform to the burner. The installation was necessarily extremely expensive. The installation was difficult and expensive to place and maintain, and in addition, was subject to physical damage because of corrosion and wave action.

Therefore, it is an object of this invention to provide an improved flare line or waste gas burner which remains above water level.

It is a further object of this invention to mount the waste gas burner in such a manner that it will be adjustable substantially for variation in wind direction.

It is a further object of this invention to provide a waste gas burner which is cheap to install and easy to maintain.

Other objects, features, and advantages of the invention will become apparent from the following description and claims when read in view of the accompanying drawings, in which:

FIG. 1 is a side view of the waste gas burner as installed on a drilling platform;

FIG. 2 is a detailed drawing of the waste gas burner which shows the details of mounting and construction; and

FIG. 3 is a top view of the waste gas burner as installed on a drilling platform.

Similar numbers will be used throughout all figures where common structural elements are shown.

Referring to FIG. 1, a drilling platform **10** is supported above a bed **11** of an ocean **12** or other body of water by a means such as a plurality of posts **13**. A drilling derrick **14** is supported on platform **10** which provides a means for drilling and maintenance of a well **15**. A flare line or waste gas burner assembly generally designated as **16** is mounted on a corner **17** of platform **10** and is connected to the end of well **15** by a pipe **18**. A swivel joint **19**, commonly referred to as a chicksan swivel, is used to connect the end **20** of burner asesmbly **16** to pipe **18**. Guy wires **21** are used to add rigidity to the waste gas burner. A second set of guy wires **22** is used to rotate burner **16** about a fulcrum located at swivel joint **19** in a plane substantially parallel to platform **10**. A guy wire **23** is used to give horizontal stability to burner assembly **16**.

Referring to FIG. 2, a more detailed drawing of burner assembly **16** is shown. A pipe or burner stack **25** is connected through an elbow **26** to swivel joint **19** which connects by a pipe **18** or other suitable means to well **15**. Stack **25** may be of any suitable strong material such as steel, aluminum, or iron. For the purpose of reduction of weight the preferred embodiment was formed from tubular aluminum. In order to form a rigid pipe **25**, collars **30**, **31**, and **32** were rigidly secured to the beginning, middle, and end, respectively, of pipe **25**. Mounted at right angles to collar **31** and rigidly secured thereto are a plurality of posts **33** which extend outwardly from the pipe substantially in the form of an X. Each of the collars **30** and **32** have a like number of rigidly secured rings **34** in a similar angular position as posts **33**. Attached between each of the rings **34** and a corresponding post **33** is guy wire **21**. The guy wire may be tightened by any well known manner such as turn-buckles or the like. A guy wire **35** likewise joins the extremes of the posts **33**. The plurality of collars, posts, and guy wires all tend to make a rigid burner stack **25**, thus, greatly reducing the weight and cost of the pipe. It is to be understood that other methods for strengthening the pipe may be used such as angle iron, I beams, or the like. Further, the pipe itself could be made of tubular material having sufficient strength that guy wiring will not be needed. For example, a tubular construction having telescopic sections of reduced diameter would have sufficient strength to eliminate the need for guying. However, the latter mentioned methods for increasing the structural strength of pipe **25** tend to also increase its cost. Thus, a preferred embodiment is a single tubular pipe with sufficient guying to give it structural rigidity. A burner **40** is mounted at the end of pipe **25** which is farthest from the platform **10**. The burner may be of any well known form, for example, a pipe having a plurality of holes **41** is illustrated. Any well known means such as electrical ignition may be used to ignite the escaping gas from holes **41**, thereby, eliminating the hazard caused by the accumulation of non-burned gas. Pipe **25** has a length sufficient to insure that burner **40** is a safe distance from platform **10**. A guy wire **42** is attached from one of the rings **34** or collar **32** to platform **10** through a pulley or other slippage device to a guy wire storage device such as a take-up or ratchet reel **44**. Guy wire **22**, likewise, connects from one of the rings **34** on collar **32**, and to the side of the platform (not shown) at right angles to the tie point on the platform where guy wire **42** attaches. Like guy wire **42**, guy wires **22** has a suitable pulley and guy wire storage device which are not shown.

In operation, waste gas from well **15** enters pipe **18** through swivel joint **19** and elbow **26** to the waste gas burner **16**. The gas is conducted down burner stack **25** to burner **40** and is expelled through holes **41**. The expelled gas is ignited by any suitable means and burned as rapidly as it escapes. If the wind is blowing against the platform towards the flare line, the position of guy wires **42** and **22** may be in any desired location. However, (referring to FIG. 3) if the wind should be coming in the direction of arrow **50**, the flare line would better operate in position **51** since this would cause the flaming gases to move away from the drilling platform **10**. If the wind should be coming from the direction of arrow **52**, the waste gas burner would be located in a position such as **53**. This would likewise cause the burning gas to be expelled in a direction which is away from the drilling platform **10**. However, if the wind is coming from an intermediate direction such as indicated by arrow **55**, the waste gas burner would have a position approx-

imately as shown in FIG. 3. If the wind is blowing in a direction opposite to arrow 50, the flare line would be located at position 53 since this would constitute the least hazard to the drilling platform. The main purpose for positioning the flare line is to minimize the probability that flaming gases will enter the vicinity of the drilling platform. The positioning of the flare line is accomplished by lengthening or shortening guy wires 42 and 22 such that the flare line 16, when the position has been established, will be securely anchored. Guy 23 may be lengthened or shortened in order to maintain the flare line 16 in a substantially horizontal plane. Thus, a waste gas burner as has been disclosed which adapts itself quite readily to a drilling platform such as is used for off-shore drilling purposes, the complicated problem of mounting and maintaining the flare line has been eliminated, and in addition, the high cost of such a flare line has been greatly reduced. Further, a flare line has been disclosed which attaches itself quite readily to variations in wind direction, thus reducing to a minimum the hazardous disposal of waste gas.

Although this invention has been described with respect to particular embodiments thereof, it is not to be so limited, as changes and modifications may be made therein which are within the spirit and scope of the invention as defined by the appended claims.

I claim:

1. In combination with a drilling platform a waste gas disposal flare comprising:

a burner stack having an outer and inner end, said burner stack comprising:

a thin-walled tubular member having first and second collars at its ends;

a third collar substantially centrally located between said first and second collars;

posts mounted transversely said centrally located collar and having one end rigidly attached thereto; and

a plurality of guy wires attached between said outer collars and secured to the midportion of said burner stack by said transversed posts;

a gas burner attached to said outer end;

pivotal supporting means attached to said platform, said means having one end receiving the inner end of said burner stack, said pivotal supporting means and said burner stack designed to receive waste gas and convey said gas to said burner; and

means secured to said platform for rigidly supporting said burner stack in a substantially horizontal position, said last-named means comprising:

a plurality of ratchet reels secured to said platform;

a plurality of guy wires, each of said guy wires disposed between said burner stack and one of said ratchet reels whereby the horizontal, angular relationship of said burner stack with said drilling platform may be varied by adjusting the length of said guy wires with said ratchet reels.

2. A device as described in claim 1 and further characterized in that said central posts have a plurality of guy wires strung therebetween.

References Cited in the file of this patent

UNITED STATES PATENTS

525,795	Palmer	Sept. 11, 1894
1,031,104	Bellew	July 2, 1912
1,515,476	Greenfield	Nov. 11, 1924
1,925,164	Woolery	Sept. 5, 1933
2,548,482	Kouril	Apr. 10, 1951
2,709,998	Broad	June 7, 1955
2,894,269	Dodge	July 14, 1959

FOREIGN PATENTS

402,707	France	Sept. 4, 1909