AIR-INFLATED DRILLING RIG COVER

INVENTOR

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My invention relates broadly to oil drilling rigs and more particularly to a protective housing for oil drilling rigs.

One of the objects of my invention is to provide a construction of protective housing for oil drilling rigs enabling operation to be carried on independently of prevailing temperature and weather conditions and to protect the oil well equipment and those at work on the rig. The cover of my invention is particularly applicable to offshore drilling rigs where an attack from salt spray results in corrosion and deterioration of the parts of the equipment. The protective cover of my invention provides means for maintaining the continuity of operations around the oil well drilling rig regardless of changes in weather and temperature and serves as a protective means against detrimental sprays from adjacent oil well operations which often produce such corrosion and congealing of foreign matter around the oil well drilling equipment as to make frequent cleaning and maintenance essential.

The cover of my invention is constructed according to the principles set forth in my co-pending application Serial No. 570,996 filed July 10, 1957, for air-inflated building structures. I utilize an airtight fabric which is impermeable to moisture as the enclosing material. I employ various kinds of airtight materials such as vinyl-coated nylon fabric of great strength that withstands both extreme warm and cold temperatures, or a laminated fabric in lieu of the coated fabric may be used. The material is weatherproof and airtight and has a life expectancy sufficient to perform all of the functions intended by the instant invention. The flexible fabric of my invention in the instant case, however, is formed by seamed strips contoured in the form of a dome or an igloo which is provided at the top with a stabilizer cap adapted to be centered upon and fitted over the top of the oil well drilling rig hoisting pole. This stabilizer cap is cemented to the fabric of the cover forming a substantially airtight connection supportable at the top of the oil well drilling rig. At approximately the base of the dome or the igloo shaped portion of the cover I provide an expander band forming a peripheral belt disposed vertically in the wall of the cover and forming means for shaping the cover substantially midway of the height of the drilling rig. The lower portion of the cover extending below the expander band is substantially cylindrical, disposed on a vertical axis. This lower portion of the cover terminates in a ballast tube which forms a seal with the surface of the drilling rig. Where this surface is irregular such as the ground around the drilling rig, the ballast tube makes an ideal seal with respect to the surface of the earth by virtue of the conformance of the ballast tube with the irregular surface of the earth and this conformance is maintained in my aforesaid co-pending application. Where the drilling rig is associated with the deck of a barge, the ballast tube insures a tight seal therewith. For purposes of conditioning the atmosphere around the drilling rig equipment and also inflating the drilling rig cover I provide a multiplicity of blowers arranged to continuously deliver streams of air to the interior of the cover around the oil drilling rig. Where the base of the cover, that is the portion which surrounds the base of the oil drilling rig, has a diameter of the order of 90 feet and where the height of the cover is of the order of 75 feet I find it de-
sirable to employ four continuously driven blowers located in opposite diametrical positions and capable of supplying quantities of air at the rate of 5000 cubic feet per minute. The blowers operate simultaneously and continuously.

Referring to the drawings in more detail reference character 3 designates an oil well drilling rig erected on the surface 2 and terminating at its top in the hoisting pole 3. Such oil well drilling rig may have a height of approximately 75 feet and the area reserved for operations about the oil well equipment may have a diameter of approximately 90 feet. It is in this area that I erect the protective cover of my invention which consists of the stabilizer cap 4 which is centered over the hoisting pole 3 as represented in Fig. 1. The material constituting the cover is shown at 5 and may be as heretofore explained vinyl-coated nylon fabric of great strength that withstands both extreme warm and cold temperatures or a laminated fabric in lieu of the coated fabric may be used. The material is waterproof and airtight and will withstand the pressure of sprays directed against the surface of the material when the building structure is supported by the material in inflated condition. The upper portion of the cover is formed by strips of the flexible material seamed and stitched to provide airtight seams and to form a substantially semi-spherical dome or igloo-shaped portion 6 as indicated in Fig. 1. The lower portion of the cover 5 is shaped to constitute a vertically extending extremity of the flexible wall 7 and terminating in the ballast tube 8 and explained more fully in my aforesaid co-pending application. The ballast tube 8 forms a seal against the surface 2. Intermediate the cylindrical portion 7 and the dome-shaped portion 6 of the cover 5 I provide an expander band 9 which is suitably attached to the interior of the surface of the material of cover 5. The band 9 is formed from aluminum and is extremely light in weight but is quite rigid in its vertical section and provides adequate reinforcement for the material. It intermediate the cylindrical section 7 and the dome-shaped section 6. I preferably cement the expander band interiorly of the material 5 forming a division between the dome-shaped portion 7 and the cylindrical portion 7 of the cover at which position the strips forming the taping section 8, 6a, 6b, etc. are seamed to the upper-ends of the vertically extending strips 7a, 7b, 7c, etc. of the cylindrical section 7 of the cover.

In order to maintain the cover in inflated condition about the oil well drilling rig, I position air delivery tubes in the side wall of the cylindrical portion 7 of the cover as represented at 11, 12, 13 and 14 connected to motor driven fan blowers units represented at 15, 16, 17 and 18. These fan blowers units supply air to the interior area of the cover at the rate of approximately 5000 cubic feet per minute which is adequate to maintain the cover 5 in inflated condition about the oil well drilling rig taking into account leakage which is bound to occur at certain of the seams, such as 20 or 21. between the seam 8 and the surface 2; and around the hoisting pole 3 at the top of the oil drilling rig. The seam 21 is stitched at 22 and is cemented or glued to the expander band 9 as represented by the layer of adhesive at 34. This joint serves to stiffen the connection between the dome-shaped section 6 and the cylindrical section 7 that installation of the cover over an oil rig or removal of the cover for installation on another oil rig is considerably simplified. In Fig. 7 I have illustrated one method of installing or removing the cover with respect to the oil rig. As shown, the oil well drilling rig is lowered by crane 24 and boom 25 over which the cable system 26 runs for suspending the stabilizer cap 4 with the cover 5 connected thereto. The stabilizer cap 4 is provided with certain eyelet connectors 27 through which equalizer cables in the form of a sling extend and are symmetrically connected to the end of the cable system 26 through eye 28. Operation of crane 24 provides a simple means for effecting and removing the drilling rig cover, but other methods may be employed. The drilling rig cover is sufficiently light in weight to enable the stabilizing cap 4 to be maneuvered into position over the hoisting pole 3 by working from within the cover on the rig 1. When the cover is initially placed in position the ballast tube 8 is completely open as represented in Figs. 1 and 7 so that the cover is not subjected to the mass provided by the weight of a ballast tube. When the cover is maneuvered into position the ballast tube 8 is filled with sand or sand bags represented at 29 in Fig. 2 and the ballast tube closed for sealing the cover against the surface 2.

In Fig. 6 I have represented the blower unit 16 in association with the air delivery tube 12. The air delivery tube 12 is detachably connected to the dome-shaped section 6 through an arrangement of annular sealing rings 39 and 31 which clamp the material of the cylindrical portion 7 of the cover and maintain such cylindrical portion in tight engagement with the annularly extending flanges 32 of the sale delivery tube 12. Detachable clamping bolts 33 secure the cylindrical wall 7 of the cover with respect to the blower tube 12 by the clamped joint between the material of the cylindrical portion 7 of the cover, the rings 39 and 31 and flange 32 of the blower tube 12.

Under certain conditions of weather and outside atmospheric temperature it may be necessary to condition the air before it is pumped into the interior of the cover by utilizing the principles set forth in my co-pending application Serial Number 670,934, filed July 10, 1957, for Air-Inflated Roof Structure for facilitating the continuous wetting of personnel on the oil drilling rig regardless of weather conditions.

Upon conclusion of operations on one drilling rig the cover and blower equipment of my invention is readily removable and is portable in character so that it may be readily installed on another drilling rig for continued operation.

While I have described my invention in certain of its preferred embodiments I realize that modifications may be made and I desire that it be understood that no limitations upon my invention are intended other than may be imposed by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is as follows:

1. An air-inflated drilling rig cover comprising a cover material substantially impervious to air and moisture and having a substantially circular contour terminating in a seal adapted to establish substantially air-tight sealing connections with the surface of said material means for dividing said cover material into a dome-shaped section and a cylindrical section and means for continuously supplying air under pressure through said cylindrical section for inflating both of said sections in a position around the oil well drilling rig, wherein the dome-shaped section of said cover material has a stabilizer cap cemented to the center of said material, said stabilizer cap including means for effecting connection with the top of the oil well drilling rig for distributing the cover material uniformly around the rig.

2. An air-inflated drilling rig cover comprising a cover material substantially impervious to air and moisture and having a substantially circular contour terminating in a seal adapted to establish substantially air-tight sealing connections with the surface surrounding an oil well drilling rig, wherein the oil well drilling rig may be lifted by crane 24 by the use of a boom 25 over which the cable system 26 runs for suspending the stabilizer cap 4 with the cover 5 connected thereto. The stabilizer cap 4 is provided with certain eyelet connectors 27 through which equalizer cables in the form of a sling extend and are symmetrically connected to the end of the cable system 26 through eye 28. Operation of crane 24 provides a simple means for effecting and removing the drilling rig cover, but other methods may be employed. The drilling rig cover is sufficiently light in weight to enable the stabilizing cap 4 to be maneuvered into position over the hoisting pole 3 by working from within the cover on the rig 1. When the cover is initially placed in position the ballast tube 8 is completely open as represented in Figs. 1 and 7 so that the cover is not subjected to the mass provided by the weight of a ballast tube. When the cover is maneuvered into position the ballast tube 8 is filled with sand or sand bags represented at 29 in Fig. 2 and the ballast tube closed for sealing the cover against the surface 2.
belt of metallic material fastened to the interior of both of said sections.

3. An air-inflated drilling rig cover comprising a cover material substantially impervious to air and moisture and having a substantially circular contour terminating in a seal adapted to establish substantially air-tight sealing connections with the surface surrounding an oil well drilling rig adapted to be protected by said material, means for dividing said cover material into a dome-shaped section and a cylindrical section and means for continuously supplying air under pressure through said cylindrical section for inflating both of said sections in a position around the oil well drilling rig, wherein said means for dividing said cover material into a dome-shaped section and a cylindrical section includes a vertically extending belt of material which is substantially rigid and conforms with the surface of said cover material, and means for fastening said belt to the interior of both of said sections.

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