July 6, 1937. A. A. HUNT ET AL 2,086,417

SUCKER ROD RACK

Filed Sept. 8, 1936

Fig. 1.

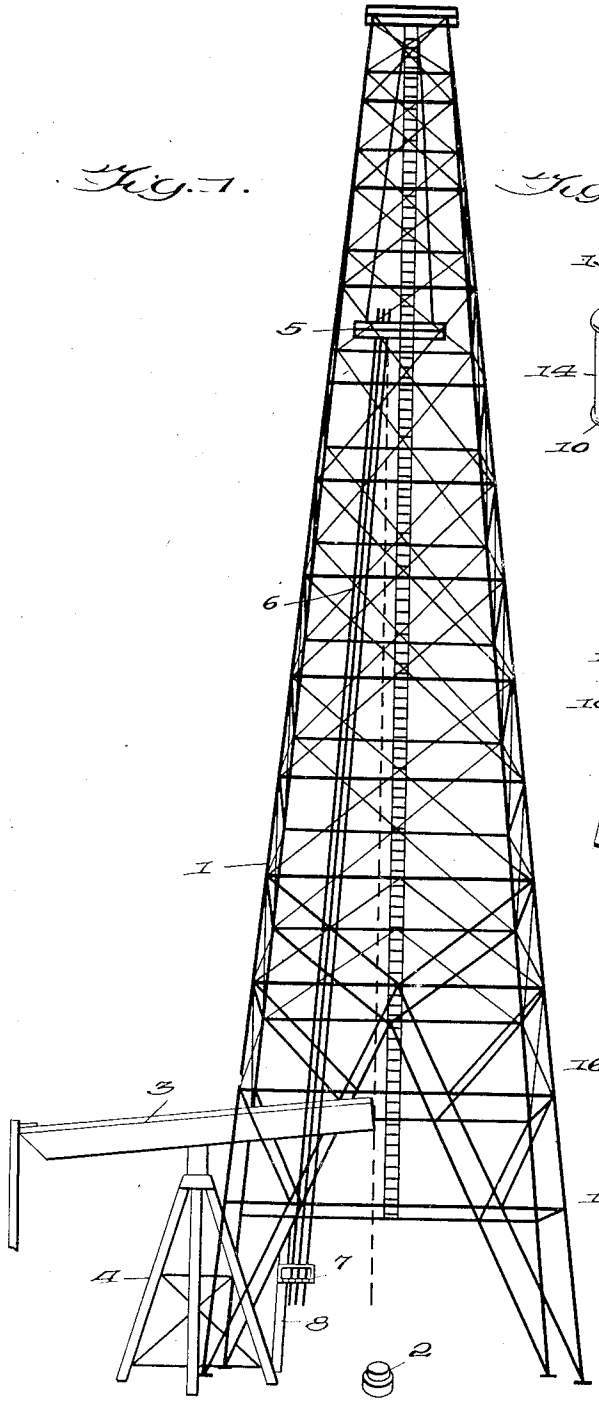
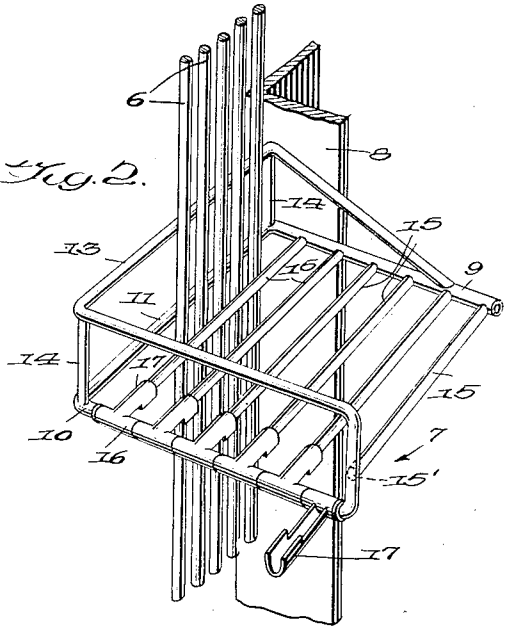


Fig. 2.



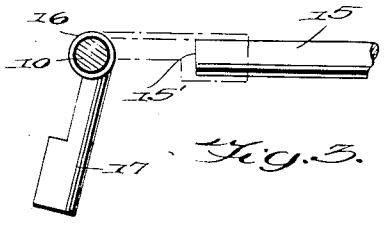


Fig. 3.

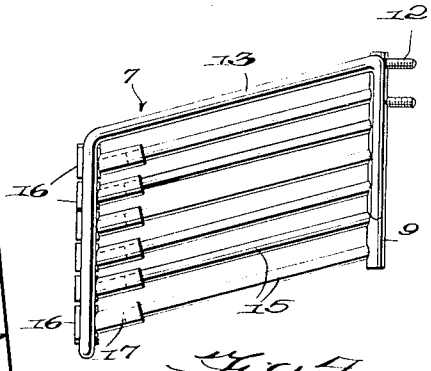


Fig. 4.

Inventors

H. H. Hunt,

L. H. Adair,

By Pruett & Pruett

Attorneys

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SUCKER ROD RACK

Arthur A. Hunt and Leo H. Adair, Oklahoma City, Okla., assignors to Skelly Oil Company, Tulsa, Okla.

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8 Claims. (Cl. 211—60)

Our invention consists in new and useful improvements in a sucker rod rack particularly adapted for use in connection with oil well derricks wherein the sucker rods are suspended in the derrick on a conventional rod hanger.

In operating oil wells wherein pumping from the surface of the well has been resorted to due to the dissipation of the natural well pressure by continued production, it often becomes necessary to raise the sucker rods used in the pumping operation for repairing the same or to clean the well itself. These rods are approximately twenty-five feet in length and are connected together by couplings to form a string. When pumping from a producing formation often 4000 or 5000 feet below the surface, it inevitably follows that the rods are subjected to great stress with the result that they become damaged in the pumping operation which necessitates pulling the entire string from the well for repairs. It is also necessary to pull this string of rods out when it is desired to clean the well itself.

In pulling these rods, conventional apparatus such as elevators, steel cables, blocks and pulleys, reels, an engine, and a hand-winch are used in and about the derrick located above each well. The string is raised and the rods are unscrewed from one another individually or in stands of two, three or four rods each, which are held at their upper extremities by the conventional rod hanger and allowed to be suspended with their lower ends about four feet from the derrick floor. Ordinarily the lower ends of the rods are not secured but are permitted to dangle in the air and are consequently subjected to the force of the wind and the possibility of being knocked out of position by the inadvertence of a workman. It has frequently happened that the lower ends of the rods or stands have swayed to such an extent that the stands have become dislodged from the hanger and dropped to the derrick floor, resulting in injury to the workmen and damage to the rods.

It is therefore the object of our invention to provide a rod rack which will minimize the hazzards heretofore occasioned by suspended rods and one which will safely hold the lower ends of such rods from swaying or being knocked from side to side.

In re-running the stands or rods in the well after the necessary repairs, a workman stands in the derrick on a suitable platform known as a "double", "treble" or "fourble" board, depending upon the length of each stand of rods, and selects the stand to be removed from the hanger and lowered by means of a hand-winch to the floor of the derrick to be screwed onto the preceding stand by a second workman on the derrick floor. Heretofore in this operation, it has been very difficult for the workman on the derrick floor to properly identify the stand to be lowered, which resulted in confusion and loss of time.

Hence, it is another object of our invention to provide a rod rack wherein the lower ends of the hanging rods or stands are held firmly in place in sequence corresponding to the order in which their upper ends are held in the rod hanger.

With the above and other objects in view which will appear as the description proceeds, our invention resides in the novel features herein set forth, illustrated in the accompanying drawing and more particularly pointed out in the appended claims.

Referring to the drawing in which numerals of like character designate similar parts throughout the several views,

Fig. 1 is a diagrammatic view showing a conventional oil well derrick with our improved rod rack in place.

Fig. 2 is an enlarged perspective view of the rod rack.

Fig. 3 is an enlarged detail of our improved latch device, and

Fig. 4 is a plan view of the rack.

In the drawing, 1 represents a conventional oil well derrick made up of four vertical legs and the usual series of trusses and braces, said derrick being located immediately above the upper end of the well casing 2. Suitable pumping apparatus, which may comprise a walking beam 3 and supporting member 4, is situated adjacent one side of the derrick 1 with the inner extremity of the walking beam in vertical alignment with the well casing 2.

Near the upper end of the derrick, the conventional rod hanger 5 is secured, said hanger usually comprising a steel plate provided with a series of narrow parallel slots adapted to receive the upper ends of the usual sucker rods 6 as they are removed from the casing. As is well known, the upper ends of the sucker rods are squared and slightly enlarged to provide shoulders for the elevators employed in withdrawing the rods from the casing, and in placing the rods in the rod hanger, these shoulders serve as abutments for the rod hanger slots.

As before stated, when the rods 6 are suspended in the hanger 5 as shown in Fig. 1, their lower ends are approximately four feet above the derrick floor, and in order to secure these rods and

prevent them from swaying in the wind, we locate our improved rod rack 7 at a point approximately five feet above the derrick floor. The rod rack is preferably secured to the conventional "headache post" 8 on one side of the derrick in the manner hereinafter described.

Referring to Fig. 2, our improved rod rack preferably comprises a three-sided frame made up of end bars 9 and 10, with a connecting side bar 11, said frame being horizontally disposed and secured to the vertical angle comprising the "headache post" 8 by means of threaded pins or studs 12 (see Fig. 4). These studs are preferably rigidly secured to the end bar 9 and extend through the angle 8, suitable nuts being provided for retaining the same in place. A reinforcing rail 13 may be secured to the frame and spaced vertically therefrom by upright members 14 as clearly shown in Fig. 2 to afford a rigid durable structure.

A series of transversely spaced parallel cross bars 15 are secured at one end to the end bar 9, for example by welding, their opposite ends extending toward the end bar 10 but being unsecured and spaced from the latter as shown at 15' in Fig. 2 to provide a series of aligned throats or openings through which the sucker rods 6 are inserted and removed as will hereinafter appear.

Immediately adjacent each cross bar 15, we provide a latch member which consists of a bearing sleeve 16 rotatably mounted on the end bar 10 and having an integral gate or latch body 17 which is preferably U-shaped in cross section and adapted to embrace the free ends 15' of the cross bars 15 and bridge the respective openings. These latches are arranged with their bearing sleeves in end to end engagement, said sleeves being of a suitable length to properly space the latch bodies with respect to the ends of the cross bars 15.

The frame, cross bars and reinforcing rail are preferably composed of steel or iron bars welded or otherwise suitably secured together in the form shown in the drawing.

In operation, all of the latches 17 are first swung outwardly on the end bar 10 in the position shown in Fig. 3 so as to open the aligned throats at the free ends 15' of the cross bars 15. As the rods 6 are pulled from the well in the conventional manner and suspended in the rod hanger 5, their lower ends are inserted through the open throats and placed in order in the corresponding slots formed by the cross bars 15 in the rod rack 7, and when any slot in the rod hanger 5 and the corresponding slot in the rod rack 7 are filled with rods or stands, the latch 17 adjacent that particular slot is swung in clockwise direction to close the throat. The operator then proceeds to fill another slot, and so on until the entire string of rods is removed from the well and placed in the hanger and rack in this manner.

In re-running the rods into the well, the foregoing operation is reversed, that is, the stands or rods are removed stand by stand from the rod hanger and rod rack and then screwed on to the string in the well in the proper order.

It will thus be seen that by the use of our improved rod rack, the lower ends of the stands or rods suspended from the rod hanger will be kept to one side out of the way as the rod pulling operation or re-running operation proceeds, and the rods will be prevented from blowing or dangling in the wind and working out of the rod hanger and dropping to the floor. The vertical dotted line in Fig. 1 indicates the normal position which the suspended rods would assume were they not retained in our improved rack.

Furthermore, in the re-running operation, the workman on the derrick floor will be enabled to quickly and easily select the stand which the workman at the rod hanger is about to remove in each succeeding stand-running step. Obviously, a device of this kind serves to protect both property and human life, and at the same time affords a substantial time saver. Due to the simplicity and durability of structure of these racks, they may be used indefinitely and are readily adaptable for use on different wells from time to time.

From the foregoing it is believed that the construction and advantages of our invention may be readily understood by those skilled in the art without further description, it being borne in mind that numerous changes may be made in the details disclosed without departing from the spirit of our invention as set out in the following claims.

What we claim and desire to secure by Letters Patent is:—

1. A rack for securing the lower ends of sucker rods suspended in a rod hanger, comprising a horizontal frame, a vertically spaced reinforcing rail secured to said frame, a series of transversely spaced cross bars carried by said frame and forming rod receiving slots, and swinging latch members for closing the mouths of said slots.

2. A rack for securing the lower ends of sucker rods suspended in a rod hanger, comprising a horizontal frame, means for securing said frame to a derrick structure, a vertically spaced reinforcing rail secured to said frame, a series of transversely spaced cross bars carried by said frame and forming rod receiving slots, and swinging latch members for closing the mouths of said slots.

3. A sucker rod rack comprising a frame, a series of transversely spaced parallel cross bars carried by one side of said frame and forming rod receiving slots, the opposite ends of said cross bars terminating in spaced relation to the opposite side of said frame to form a series of aligned openings to facilitate the insertion and removal of rods from said slots and means for closing said openings.

4. A sucker rod rack comprising a frame, a series of transversely spaced parallel cross bars carried by one side of said frame and forming rod receiving slots, the opposite ends of said cross bars terminating in spaced relation to the opposite side of said frame to form a series of aligned openings to facilitate the insertion and removal of rods from said slots, and swinging latch members carried by said frame adjacent the spaced ends of said cross bars for closing the respective openings.

5. A sucker rod rack as claimed in claim 4 wherein said latch members comprise a bearing sleeve rotatably mounted on the frame, and gate members rigidly secured to said sleeves adapted to bridge said openings and embrace the free ends of said cross bars.

6. A rack for securing the lower ends of sucker rods suspended in a rod hanger comprising a series of connected bars forming a substantially U-shaped horizontal skeleton frame, and a se-

ries of transversely spaced cross bars carried by one of the opposed side bars of said frame and terminating in spaced relation to the opposite side bar of said frame to form a series of aligned entrances to the spaces between said cross bars.

7. A rack for securing the lower ends of sucker rods suspended in a rod hanger comprising a series of connected bars forming a substantially U-shaped horizontal skeleton frame, a series of transversely spaced cross bars carried by one of the opposed side bars of said frame and terminating in spaced relation to the opposite side bar of said frame to form a series of aligned entrances to the spaces between said cross bars, and a vertically spaced reinforcing rail secured to said frame.

8. A rack for securing the lower ends of sucker rods suspended in a rod hanger comprising a series of connected bars forming a substantially U-shaped horizontal skeleton frame, a series of transversely spaced cross bars carried by one of the opposed side bars of said frame and terminating in spaced relation to the opposite side bar of said frame to form a series of aligned entrances to the spaces between said cross bars, and a series of latch members for closing the respective entrances.

ARTHUR A. HUNT.
LEO H. ADAIR.