This invention relates to improvements in portable foundation units, and more particularly to portable foundation units for use in the oil fields for mounting pump jacks and the like, and which units may be used singly or in multiple, as the particular pump jack to be mounted requires.

It has been the practice heretofore to mount heavy pieces of pumping equipment on stationary foundations, which required excavation, the building of forms, and the pouring of concrete, with the ensuing waiting period for the concrete to set and to harden, before a pump jack could be placed thereon for use. Since the element of time is of great value in producing oil wells, the operation of preparing a foundation and setting the pump jack usually required many days, thereby resulting in the loss of production time, which might mean the loss of several thousand dollars.

Since time is of the essence in producing oil from a well, under present circumstances, it is desirable to be able to set up and place in operation, a pump jack, the same day the well is completed so that the production of oil may be started without delay.

The present portable foundation units, which are precast, may be set in place in such multiples and the particular pumping operation requires, to provide the necessary weight and footing and the stability to support the pump jack, which pump jack, when placed on the precast foundation without delay, thereby enabling the setting of the pump jack in a matter of two to three hours, which will pump deep wells as readily as would a pump jack, the setting of which required a week or more, in the preparation of the foundation, the erection, and completion.

The present pump jack foundation units are constructed so that they may be standardized into about three basic sizes, which will provide suitable mounting for pump jacks from the smallest to the largest.

Due to the heavy impact and to the vibration caused by the pump jack during the pumping of an oil well, it is necessary that the concrete foundation be reinforced in such manner as to provide the utmost strength, so as to anchor and reinforce the foundation unit so that the vibration and the impact of the pump jack will not cause disintegration of the concrete or cause the reinforcing members to break away from the concrete or from the support beam.

An object of this invention is to provide a pump jack foundation unit which is sufficiently light to be handled by means of truck and winch equipment, but which is sufficiently heavy to properly harden when used in multiples, will securely hold the pump jack in fixed relation with respect to the well being pumped.

Another object of the invention is to provide a portable foundation unit for a pump jack, which is made of concrete and reinforced with steel, and wherein the steel reinforcing members are integrally connected to a support beam which is cast integral within the concrete foundation unit, on which unit, a pump jack or the like may be secured.

Still another object of the invention is to provide a method of constructing a foundation unit for a pump jack or the like, which may be constructed as a unit, with a structural support member may be subsequently apertured to enable anchor bolts to be fitted therein.

Still another object of the invention is to provide a foundation unit for a pump jack or the like, which is easy to construct, which is comparatively low in cost, extremely durable, and which may be readily removed from the well site when its usefulness at that particular location has been served, and moved to another location for further use.

With these objects in mind and others which will become apparent as the description proceeds, reference is to be had to the accompanying drawings, in which like reference characters designate like parts in the several views thereof, in which:

FIG. 1 is a perspective view of the pump jack foundation unit, with parts broken away and shown in section to illustrate the details of construction;

FIG. 2 is a longitudinal, sectional view taken on the line 2—2 of FIG. 1, looking in the direction indicated by the arrows;

FIG. 3 is a transverse sectional view taken on the line 3—3 of FIG. 1, looking in the direction indicated by the arrows;

FIG. 4 is a top plan view of a pump jack foundation showing the pump jack sills therein, with the pump jack superstructure being broken away, and with parts shown in section, to show the details of construction, and to show how the pump jack is positioned on and secured to the foundation units; and

FIG. 5 is a fragmentary, perspective view showing a portion of a pump jack sill, a hold-down clamp and a fragmentary portion of an elongated hollow structural member which is normally imbedded within the foundation unit.

With more detailed reference to the drawings, the numeral 1 designates generally a pump jack foundation unit, which is a precast, concrete, and structural unit, which unit is constructed in the following manner.

A mold cavity (not shown) is formed on a plane surface with upright forms in a manner well understood in the art of molding concrete blocks and the like, which mold cavity is of a width and length, as well as depth, to form a concrete member of the desired size.

With the above prepared mold cavity being available for casting the foundation unit, a reinforcing unit comprising lower and upper wire mesh members 2 and 4, of a size that approaches the area of the footing of the foundation unit, are placed within the mold cavity and supported above the bottom thereof, as will be brought out more fully hereinafter. A longitudinal, box structural member 6, which is preferably constructed of structural channels with the flanges thereof welded together throughout the length thereof, and with plates 8 closing the ends thereof and being welded thereto to form a water tight member, which box member 6 has transverse reinforcing rods 10 secured along the lower side thereof, as by welding, is also placed in the mold cavity and supported above the bottom thereof by pairs of upright support rods 12, which are welded or otherwise secured to the outer-most of the transverse reinforcing members 10. It is preferable that the upright support rods 12 be of a length substantially that of the thickness of the foundation unit to be cast. The mesh wire members 2 and 4 are preferably of the character known as 6" x 6" x ⅜" mesh, the upper member 4 being cut away along the center portion thereof to receive box structural member 6 therein in close fitting relation with respect thereto. The rods that form the respective reinforcing mesh members are secured together at the junctions thereof, and the rods of the member 4 adjacent the structural boxed member 6 are welded thereto, so as to support the member 4 along the length of the structural member 6 with the upper face of the structural box member 6 lying within the same plane as the upper face of the foundation unit 1. The wire mesh
member 2 is secured to the respective upright support rods 12 the same spaced distance upward from the respective lower ends thereof, as will best be seen in FIGS. 1 and 2.

The reinforcing wire mesh 2 is supported above the bottom of the mold cavity by support wires 16 and by welding upright members 12 to the reinforcing mesh wire 2, as will best be seen in FIGS. 1 and 3. Further reinforcing support wires 18 extend between the wire mesh 2 and the wire mesh 4, so as to maintain the wire mesh members 2 and 4 a spaced distance apart, and a spaced distance above and below the lower and upper surfaces, respectively, of the mold cavity.

The upper wire mesh member 4 is cut out centrally thereof to receive box structural member 6 therein with the adjacent ends of wire mesh members 4 being in abutting relation therewith so that the ends thereof can be welded to structural support member 6, as will best be seen in FIGS. 1, 2, and 3.

When the form or mold cavity has been prepared, and after the structural member 6 and the reinforcing members as set out above have been prepared so that the upper face of the structural support member 6 will be in the same plane as the finished concrete foundation unit 1 and the upper ends of the upright support rods 12, concrete of the proper mixture is poured into the form and allowed to set.

After the concrete has become hardened to the desired degree, a hole 20, with a connecting slot 22 is cut in the upper face of the boxed member 6, near each end thereof, substantially as shown in FIG. 1, which holes and slots are of a size which will admit the passing of a bolt head through each hole 20 and the passing of the shank of the bolt into the respective slots 22, so that the head will be retained within the hole 20, while the shank of the bolt extends out of the upper face of said structural member 6. Each slot 22 is of such length that the pump jack sills 24, which are made of structural material such as channel or I-beam, will rest upon the structural support member 6 and the foundation member 1, so that the holes 26 in the lower face of the sills 24 will be in register with the slots 22. In this manner, anchor bolts may readily anchor the sills 24, of the pump jack, to the individual, transversely arranged foundation blocks 1, and if the pump jack is comparatively light, and the well shallow, a fewer number of transverse blocks 1 need be used. However, if the pump jack is deep, the foundation blocks may be placed in side-by-side relation for form a foundation of sufficient weight and footing to form a stable foundation for the pump jack.

The foundation units may be readily handled by passing into the respective slots 22 and by attaching a swing chain hoist to the eye-bolts 22 the blocks may be handled by a winch and gin pole. When moved to the site of the well, the blocks may be lowered into place and leveled so as to provide the foundation for the pump jack, be it large or small.

The present pump jack foundation 1 is so constructed of reinforcing rods, wire mesh and concrete and structural iron, so positioned, and put together as to withstand the impact and vibration of a pump jack, and are so constructed that they may be used under the most adverse conditions, such as in mud, salt water, or the like, and which foundation units may be moved from one site and taken to another site for reuse, thereby effecting a material saving in time, material and labor. Being of extremely sturdy construction, the foundation blocks, which are the subject matter of this application, may be used over a long period of time and under any conditions in which they might be subjected without ill effects thereto.

The reinforcing members imbedded within the concrete and welded at points of stress to adjoining reinforcing members and structural members such as 6 and the other portions of reinforcing members, such as transverse members 10 and wire mesh members 2 and 4 are secured together by support members such as 16 and 18, so as to maintain the various reinforcing elements in spaced apart, supported relation. While the support members 16 and 18 are shown to be loosely entwined around the transverse reinforcing members 10 and wire mesh members 2 and 4, it is shown in this manner, however, for the sake of clarity of illustration, as the support members 16 and 18 are actually tightly entwined around the members 10, 2, and 4, to form a reinforcing unit which, when imbedded in the concrete, will resist movement in the concrete, thereby forming a strong composite structural unit which is sufficiently rugged to withstand the effects of large and vibrations due to the pump jack.

The pump jack sills 24 are usually of channel or I-beam material, such as shown in FIGS. 4 and 5, which sills have outstanding flanges 23, one end of which has a clamp 25 resting thereon, the end of which clamp bar 25 has a support 25a welded, or otherwise secured thereto, so upon tightening a nut on bolt 27, which bolt extends into hollow structural member 6 through the slot 22, the clamp bar 25 will be brought into binding relation with out-turned flange 23 of structural jack sill 24 so as to hold the structural jack sill 24 in fixed relation with respect to foundation blocks 1, as shown in FIG. 4.

Bolts 27a may be used to pass through slots 22 and a hole 26 in out-turned flange 23, when such holes are correctly positioned within the flange 23 of jack sill 24, however it is frequently desirable to install additional foundation members 1, at points along the jack sill 24 where such holes are not located. In which instance the clamp may be used to bindingly secure the sills in fixed relation with respect to foundation blocks 1, at any point in the length of the sills.

While the invention has been illustrated and described in some detail, it is to be understood that changes may be made in minor details of construction and adaptations made to different installations, without departing from the spirit of the invention or the scope of the appended claims.

Having thus clearly shown and described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. In an article of manufacture, a re-usable, rectangular solid, precast concrete foundation unit for pump jack, machinery and the like, which concrete foundation heat and the well is substantially a plane of a pair of upright support rods, with a pair of said respective pairs of rods lying on each side of transverse medias planes passing through said concrete foundation unit and being parallel to said other pair of upright support rods, a transverse reinforcing member intersecting between certain pairs of said upright support rods and being secured thereto, a longitudinal, box structural member extending across, supported on, and secured to said transverse reinforcing members, which box structural member has the upper face thereof lying substantially in a plane with the upper ends of said upright support rods, said longitudinal, box structural member having holes formed in the upper face thereof to receive the heads of bolts thereinto, said longitudinal, box structural member having elongated slots formed in the upper face thereof which slots are in communication with said respective holes, said slots being of such width as to receive the stem of said bolts therethrough and of less width than the greatest dimension of said head of the bolt to be used therein, a wire mesh reinforcing member secured to each rod of said pairs of upright support rods the same spaced distance from the respective lower ends thereof, and of an area substantially as large as the largest dimension of said concrete foundation unit, and a mass of concrete surrounding said pairs of upright support rods, said transverse reinforcing members and said wire mesh reinforcing member, with the upper face of said concrete mass lying substantially in the same plane as the upper ends of said upright support rods and the upper
face of said longitudinal, box structural member, and with the lower face thereof lying substantially in the same plane as the lower ends of said pairs of upright support rods.

2. An article of manufacture comprising a re-usable, rectangular solid, precast, concrete foundation unit for pump jacks, machinery and the like as defined in claim 1, wherein said longitudinal, box structural member is positioned mediate the sides of said concrete foundation unit and has the ends thereof spaced inward from each end of said foundation unit, and further transverse reinforcing members secured to the lower face of said longitudinal, box structural member and extending outward therefrom, support wires extending between said further transverse reinforcing members and said wire mesh member at spaced intervals, and wherein a second wire mesh member is positioned above said first mentioned wire mesh member and is secured to said longitudinal, box structural member and extends outward therefrom below the lower face thereof, and support wires extending between said transverse reinforcing members and said second wire mesh reinforcing member.

References Cited in the file of this patent

UNITED STATES PATENTS
1,035,525
Bright

1,691,037
Allen

1,998,803
Collins

2,086,650
Trout

2,802,632
Byers

FOREIGN PATENTS
279,559
Germany

Aug. 13, 1912
Nov. 13, 1928
Apr. 23, 1935
July 13, 1937
Aug. 13, 1957
Oct. 24, 1914