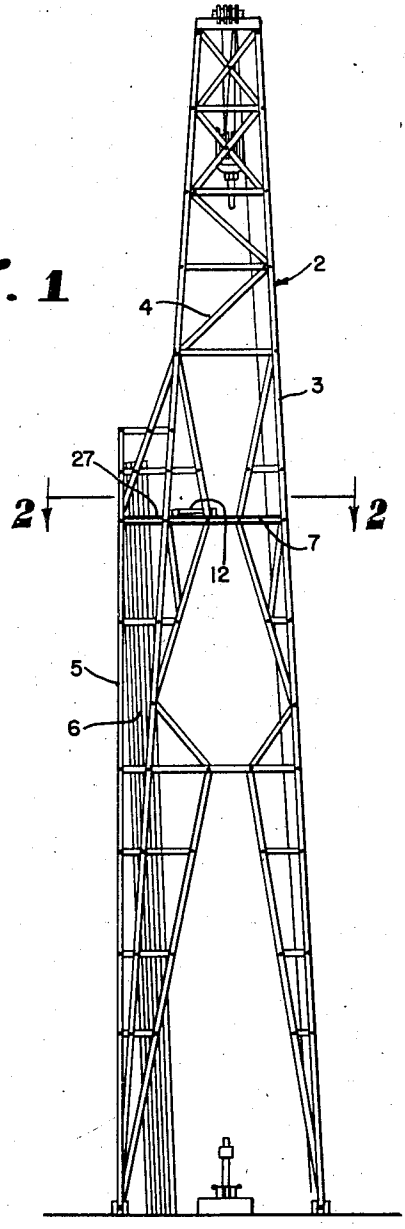
Dec. 3, 1946. W. D. WALTERS 2,412,020

WORKING PLATFORM ARRANGEMENT FOR PORTABLE DERRICKS

Filed June 15, 1945 2 Sheets-Sheet 1

Fig. 1



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Fig. 2

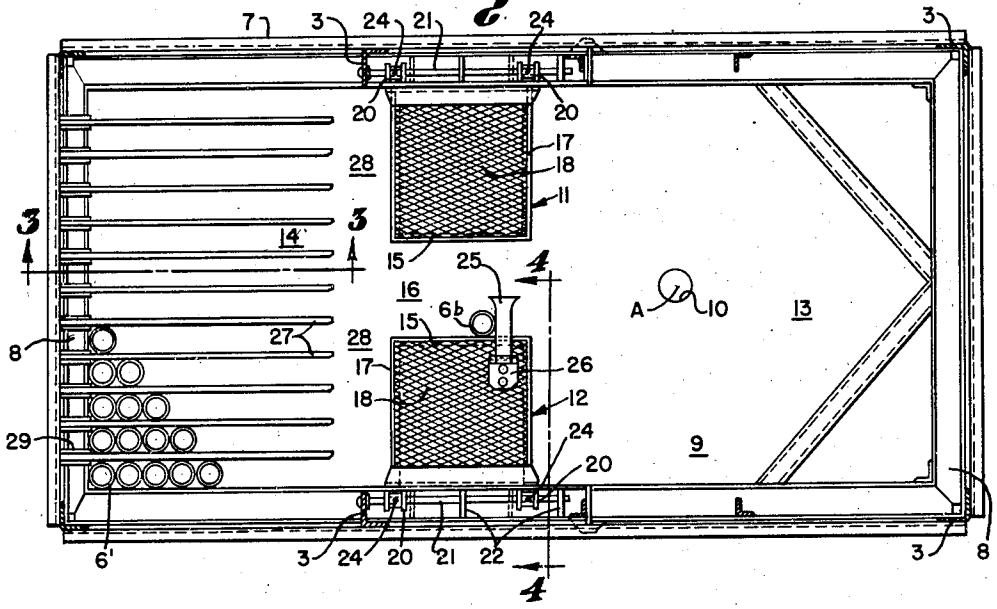


Fig. 3

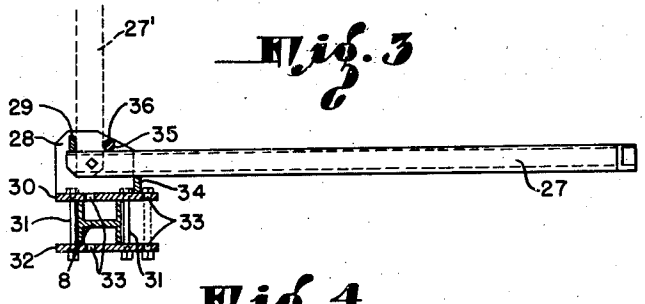
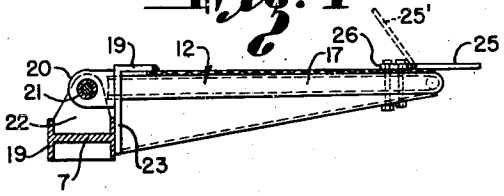


Fig. 4



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UNITED STATES PATENT OFFICE

2,412,020

WORKING PLATFORM ARRANGEMENT FOR PORTABLE DERRICKS

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Application June 15, 1945, Serial No. 599,714

19 Claims. (Cl. 304—14)

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My invention relates to derricks or masts employed in conjunction with the drilling and maintenance of wells, and the invention relates in particular to a derrick having in the upper part thereof means for facilitating the handling and racking of pipe.

A string of pipe used in a well for rotary drilling consists of a plurality of stands of pipe, each stand of pipe comprising a number of separate lengths of pipe connected together by couplings. It is an object of the invention to provide in the upper part of a derrick an improved working platform and racking arrangement for facilitating the handling of these pipe stands during the operation of lowering the pipe into or withdrawing the pipe from the well.

An object of the invention is to provide a working platform arrangement on which a workman may work with safety, specific parts of the arrangement being so placed as to facilitate the handling of the pipe during the racking of the pipe or during the removal of the pipe from the rack and the assembling of the pipe stands in a continuous string, as such string is lowered into the well.

An object of the invention is to provide in the upper part of a derrick a platform assembly which comprises a pair of platforms projecting into the derrick area from opposite sides of the derrick structure so that a passage or mouth is defined between the adjacent portions of these platforms, this mouth connecting a working zone and a pipe racking zone defined in the derrick area by the platforms.

An object of the invention is to provide a pair of working platforms as described in the preceding paragraph, these platforms being placed so that their inner edges will be sufficiently close together to enable a workman to stand in a position straddling the space or mouth between the adjacent edges of the platforms. When in this position, the workman faces the projected axis of the well, in centralized relation so that he may apply to best advantage such force as is necessary to produce movement of the upper end of a stand of pipe.

A further object of the invention is to provide a dual platform arrangement for the upper part of a derrick wherein a path of movement for the upper end of the stand of pipe is defined by the adjacent edges of the platforms, and a stop or rest which extends into or along this path of movement in a position between the projected axis of the well and the racking space, against which the upper portion of the pipe stand may

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be rested during a part of the operation of racking or unracking the pipe.

A further object of the invention is to provide in the upper part of a derrick a pair of oppositely disposed inwardly projecting platforms, with means for adjusting these platforms toward and away from the center of the working zone, and a further object of the invention is to provide a simplified means for guiding or positioning the upper ends of the racked pipe, which means will also serve as a footrest or platform on which the workman may stand.

Further objects and advantages of the invention will be brought out in the following part of the specification.

Referring to the drawings which are for illustrative purposes only,

Fig. 1 is a side elevation of a derrick having my present invention therein.

Fig. 2 is an enlarged cross section taken as indicated by the line 2—2 of Fig. 1.

Fig. 3 is an enlarged sectional view taken as indicated by the line 3—3 of Fig. 2.

Fig. 4 is an enlarged sectional view taken as indicated by the line 4—4 of Fig. 2.

The derrick 2 shown in Fig. 1 comprises legs 3 connected by suitable girts and cross bracing 4. The derrick 2 is laterally enlarged as indicated at 5 to provide a racking space for pipe stands 6. The upper portion of the derrick structure includes girts 7 and 8 disposed in opposed pairs as shown in Fig. 2 so as to form an upper framework defining in the upper part of the derrick a rectangular derrick area 9. For the purpose of this description, the derrick area 9 is the area which lies within the girts 7 and 8. A portion of this area 9 traverses the upper part of the pipe racking space and also intersects the projected axis A of the well 10.

Platforms 11 and 12 of substantially the same shape and area are extended into the area 9 from the girts 7 so as to divide the area 9 and define therein a working zone 13 surrounding the projected axis A of the well, and a racking zone 14 which is situated in the upper portion of the pipe racking space of the derrick. The working and racking zones lie within the frame work formed by the pairs of girts 7 and 8, and, lying in side by side relation have a common side along which the platforms 11 and 12 are extended. The inner edges 15 of the platforms 11 and 12 are spaced apart so as to define a contracted passage or mouth 16 connecting the zones 13 and 14 and forming a part of a path of movement for the upper portions of the pipe from the projected well

axis A to the racking zone 14. Each platform 11 and 12 has a rectangular frame 17 and a reticulated floor 18 through which the workman standing on either of the platforms, or both of them, may view the proceedings in the lower part of the derrick as a guide to his own activities in handling the upper portions of the pipe. At the outer edge of each platform 11 and 12 there is a member, shown as a structural angle, 19 having hinged members 20 projecting therefrom to engage a horizontal bar 21, supported upon the contiguous girt 7 by means of brackets 22. When the platforms are in horizontal positions, the lower legs of the angles 19 will engage the girts 7, as shown at 23 in Fig. 4, to support the platforms in horizontal positions without need for additional bracing. The platforms may be swung into upright, retracted positions on the bars 21, when desired, and the hinge members 20 may be slid along the bars 21 for the purpose of adjusting the platforms 11 and 12, which are common to the zones 13 and 14, toward and away from the center of the working zone 13, or, in other words, this adjustment makes possible the changing of the space between the platforms and the projected axis A of the well as may be required for greatest facility in the handling of the upper portions of the pipe during the making up of the string of pipe or the racking of the pipe as the string is removed from the well. The hinge members 20 are provided with stud screws 24 whereby the platforms may be locked in place after they are adjusted.

A finger or stop 25 is provided in a position projecting into the path of movement of the upper portions of the pipe from the working zone 13 to the racking zone 14. This stop 25 comprises a plate or bar having the outer end thereof enlarged, as shown in Fig. 2, so as to provide a hook effect which will prevent a pipe from sliding off the stop, when the upper portion of the pipe is rested against the stop, as indicated at 6b in Fig. 2.

The inner end of the stop 25 is hinged to a plate 26 which is bolted onto the platform 12 near the edge of the platform nearest the working zone 13, and in such position that the stop may project into the mouth 16 which is formed between the inner edges of the platforms 11 and 12. The stop 25 may be swung into retracted position, indicated by dotted lines 25', Fig. 4, and when use of the stop is required, the workman may kick the same over into extended position with one foot, while his hands are employed for holding or guiding the upper portion of the pipe.

The means provided for guiding or holding the upper ends of the pipe when it is racked as indicated at 6' in Fig. 2 comprises a plurality of fingers 27 which are extended from the left hand girt 8, in parallel relation to and on opposite sides of the extended axis of the passage 16, into the racking zone 14 toward and in similar relation or in the same direction with reference to the platforms 11 and 12, the length of these fingers 27 being such that a lateral space or passage 28 is left between the ends of the fingers 27 and the platforms 11 and 12 through which the upper portions of the pipe may be moved from the mouth 16 to the spaces between the fingers 27 or between the fingers 27 and the adjacent portions of the girts 7.

In Fig. 3 I have shown means for adjustably supporting the fingers 27 so that the spacing therebetween may be varied and so that the fingers may be swung from horizontal positions in which they are shown in to vertical positions retracted from the racking zone 14. The left hand girt 8 is shown as a H structural section capable of supporting a plurality of brackets 28 which pivotally support the fingers 27. Each bracket 28 includes a pair of vertical plates 29 which project upward from a base plate 30 which is clamped against the upper portion of the girt 8, as shown in Fig. 3. This clamping of the brackets in desired positions is accomplished by use of bolts 31 which extend through the base plates 30 and cooperating clamping plates 32 which extend across the lower face of the girt 8. The plates 30 and 32 have therein several sets of bolt openings 33, through which the bolts 31 may be extended, these several sets of bolt openings 33 making it possible to shift the brackets 28 toward or away from the racking zone 14. Also, it is possible to slide the brackets 28 along the girt 8 so as to change the spacing of the fingers in keeping with the diametral dimension of the pipe which is racked. Each of the brackets 28 has a block 34 for supporting the cooperating finger 27 in horizontal position, and the plates 29 are provided with openings 35 through which pins may be extended as indicated at 36 in Fig. 3, to hold the fingers 27 in vertical position as indicated by dotted lines 27'. The pins 36 are positioned so that they will also serve as stops to prevent the fingers 27 from being raised from the horizontal positions in which they are shown in full lines. A workman may progressively lower the fingers 27 from vertical position to horizontal position as the pipe racking proceeds, or he may retain all or most of the fingers in horizontal position. The upper faces of the fingers 27 are substantially level with the platforms 11 and 12 so that the workman may readily step from the platforms onto the fingers or, in guiding the upper portion of a pipe to or from the space between adjacent fingers, the workman may stand with one foot on a platform and the other foot on a finger or upon a board which is placed across a number of fingers 27.

When going out of the well—that is to say, when the string of pipe is being pulled from the well—and the pipe stands are consecutively unscrewed and stacked in the racking space of the derrick, the workman may stand with one foot on each of the platforms 11 and 12, so as to straddle the opening 16 facing the block, as the hoisting equipment pulls the pipe into the upper part of the derrick. The workman is thus positioned on the center line of the derrick and so close to the projected axis A of the well that he may readily handle the upper end of the pipe. For example, when the lower end of the raised pipe stand is uncoupled from the remainder of the string which extends into the well, he may without difficulty exert a force against the upper end of the pipe or against the elevator to swing the pipe away from him. The return swing of the pipe will bring it close to him so that he can bring it to rest against the stop 25, as indicated at 6b, Fig. 2, and then unlatch the elevators after the workmen on the derrick floor have properly positioned the lower end of the pipe in the pipe racking space of the derrick. The upper portion of the pipe may be then moved through the mouth 16 and the space 28 into the selected space between or adjacent fingers 27. In going into the hole, the upper portion of the pipe is moved from its position in the rack and placed behind or against the stop 25 so as to be then in position for attachment of the elevators.

I claim as my invention:

1. In a derrick having in the upper part thereof a structure defining a derrick area, the combination of: a pair of platforms, each extending in from an intermediate portion of an opposite side of the derrick structure with the inner edges thereof spaced apart so as to define in said derrick area a working zone and a racking zone and a mouth connecting said zones through which the upper portion of a pipe may be passed from one of said zones to the other, said platforms having their inner edges spaced so that a workman can stand straddling said mouth and said working and racking zones expanding adjacent the ends of said platforms to the full width of the derrick area.

2. In a derrick having in the upper part thereof a structure defining a derrick area, the combination of: a pair of platforms, each extending in from an opposite side of the derrick structure with the inner edges thereof spaced apart so as to define in said derrick area a working zone and a racking zone and a mouth connecting said zones through which the upper portion of a pipe may be passed from one of said zones to the other; and a stop hingedly connected to one of said platforms so as to swing upwardly from a position projecting into said mouth to a retracted position above the platform to which it is connected.

3. In a derrick having in the upper part thereof a structure defining a derrick area, the combination of: a pair of platforms, each extending in from an intermediate portion of an opposite side of the derrick structure with the inner edges thereof spaced apart so as to define in said derrick area a working zone and a racking zone and a mouth connecting said zones through which the upper portion of a pipe may be passed from one of said zones to the other, said mouth forming part of a path of movement through which the upper portion of the pipe is normally moved from the working zone to the racking zone and said working and racking zones expanding adjacent the ends of said platforms to the full width of the derrick area; and a stop extending into said path of movement against which the upper portion of the pipe may be rested, said stop being hingedly connected to one of said platforms so as to swing upwardly from a position extending from the platform to a retracted position above the platform to which it is connected.

4. In a derrick having in the upper part thereof a structure defining a derrick area, the combination of: a pair of platforms, each extending in from an intermediate portion of an opposite side of the derrick structure with the inner edges thereof spaced apart so as to define in said derrick area a working zone and a racking zone and a mouth connecting said zones through which the upper portion of a pipe may be passed from one of said zones to the other, said mouth forming part of a path of movement through which the upper portion of the pipe is normally moved from the working zone to the racking zone; a stop extending into said path of movement against which the upper portion of the pipe may be rested; and racking guides supported in said racking zone in positions projecting toward said working zone.

5. In a derrick having in the upper part thereof a structure defining a derrick area, the combination of: a pair of platforms, each extending in from an intermediate portion of an opposite side of the derrick structure with the front and rear ends thereof spaced from the ends of the derrick area and the inner edges thereof spaced apart so as to define in said derrick area a working zone and a racking zone and a mouth connecting said zones through which the upper portion of a pipe may be passed from one of said zones to the other, said platforms having their inner edges spaced so that a workman can stand straddling said mouth; and a plurality of substantially horizontal fingers projecting toward said working zone and disposed in spaced relation in said racking zone so as to define spaces to receive the upper portions of said pipe and sufficiently close to the level of said platforms as to provide footrests on which the workman may stand.

6. In a derrick having in the upper part thereof a structure defining a derrick area, the combination of: a pair of platforms, each extending in from an intermediate portion of an opposite side of the derrick structure with the front and rear ends thereof spaced from the ends of the derrick area and the inner edges thereof spaced apart so as to define in said derrick area a working zone and a racking zone and a mouth connecting said zones through which the upper portion of a pipe may be passed from one of said zones to the other, said platforms having their inner edges spaced so that a workman can stand straddling said mouth; and a plurality of substantially horizontal fingers extending in said racking zone so as to have the free ends thereof faced toward said working zone and spaced from the adjacent ends of the platforms so as to provide a lateral passage communicating intermediate its ends with said mouth, said fingers defining spaces to receive the upper portions of said pipe and sufficiently close to the level of said platforms as to provide footrests on which the workman may stand.

7. In a derrick having in the upper part thereof a structure defining a derrick area, the combination of: a pair of platforms, each extending in from an intermediate portion of an opposite side of the derrick structure with the inner edges thereof spaced apart so as to define in said derrick area a working zone and a racking zone and a mouth connecting said zones through which the upper portion of a pipe may be passed from one of said zones to the other; and means adjustably connecting said platforms to said structure so that they may be translated horizontally toward and away from the center of said working zone.

8. In a derrick having in the upper part thereof a structure defining a derrick area, the combination of: a pair of platforms, each extending in from an opposite side of the derrick structure with the inner edges thereof spaced apart so as to define in said derrick area a working zone and a racking zone and a mouth connecting said zones through which the upper portion of a pipe may be passed from one of said zones to the other, said platforms having their inner edges spaced so that a workman can stand straddling said mouth; a plurality of substantially horizontal fingers extending in said racking zone so as to have the free ends thereof faced toward said platforms, said fingers defining spaces to receive the upper portions of said pipe and sufficiently close to the level of said platforms as to provide footrests on which the workman may stand; and means adjustably connecting said platforms to said structure so that they may be moved toward and away from the center of said working zone.

9. In a derrick having in the upper part thereof

a structure defining a derrick area, the combination of: a pair of platforms, each extending in from an opposite side of the derrick structure with the inner edges thereof spaced apart so as to define in said derrick area a working zone and a racking zone and a mouth connecting said zones through which the upper portion of a pipe may be passed from one of said zones to the other, said platforms having their inner edges spaced so that a workman can stand straddling said mouth; a plurality of substantially horizontal fingers extending in said racking zone so as to have the free ends thereof faced toward said platforms, said fingers defining spaces to receive the upper portions of said pipe and sufficiently close to the level of said platforms as to provide footrests on which the workman may stand; means adjustably connecting said platforms to said structure so that they may be moved toward and away from the center of said working zone; and a stop extensible into the path of movement of the upper portion of the pipe from said working zone to said racking zone, against which the upper portion of the pipe may be rested.

10. In a derrick having in the upper part thereof, a structure defining a derrick area, the combination of: a pair of horizontal, substantially parallel, bars carried by the opposite sides of said structure on the opposite sides of said derrick area; a pair of platforms each extending inward from one of said bars so as to define in said derrick area a working zone connected to a racking zone by a mouth through which the upper portion of the pipe may be moved; means adjustable along said bars connecting said platforms respectively to said bars to support said platforms and enable adjustment of said platforms toward and away from the center of the working zone; and a stop extensible into the path of movement of the upper portion of said pipe from said working zone to said racking zone against which said pipe may be rested.

11. In a derrick having in the upper part thereof a structure defining a derrick area, the combination of: a pair of horizontal, substantially parallel, bars carried by the opposite sides of said structure on the opposite sides of said derrick area; a pair of platforms each extending inward from one of said bars so as to define in said derrick area a working zone connected to a racking zone by a mouth through which the upper portion of the pipe may be moved; means adjustable along said bars connecting said platforms respectively to said bars to support said platforms and enable adjustment of said platforms toward and away from the center of the working zone; pipe racking guides in said racking zone; and a stop extensible into the path of movement of the upper portion of said pipe from said working zone to said racking zone against which said pipe may be rested.

12. In a derrick having in the upper part thereof a structure defining a derrick area, the combination of: a pair of horizontal, substantially parallel, bars carried by the opposite sides of said structure on the opposite sides of said derrick area; a pair of platforms each extending inward from one of said bars so as to define in said derrick area a working zone connected to a racking zone by a mouth through which the upper portion of the pipe may be moved; means adjustable along said bars connecting said platforms respectively to said bars to support said platforms and enable horizontal translation of said platforms toward and away from the center of the working zone; and pipe racking guides in said racking zone.

13. In a derrick having in the upper part thereof, a structure defining a derrick area, the combination of: a pair of horizontal, substantially parallel, bars carried by the opposite sides of said structure on the opposite sides of said derrick area; a pair of platforms each extending inward from one of said bars so as to define in said derrick area a working zone connected to a racking zone by a mouth through which the upper portion of the pipe may be moved; means adjustable along said bars connecting said platforms respectively to said bars to support said platforms and enable adjustment of said platforms toward and away from the center of the working zone; a plurality of substantially horizontal fingers extending in said racking zone so as to have the free ends thereof faced toward said platforms, said fingers defining spaces to receive the upper portions of said pipe and sufficiently close to the level of said platforms as to provide footrests on which the workman may stand; and a stop extensible from one of said platforms into the path of movement of the upper portion of said pipe from said working zone to said racking zone against which said pipe may be rested.

14. In a derrick having in the upper part thereof a structure defining a derrick area, the combination of: a pair of horizontal, substantially parallel, bars carried by the opposite sides of said structure on the opposite sides of said derrick area; a pair of platforms each extending inward from one of said bars so as to define in said derrick area a working zone connected to a racking zone by a mouth through which the upper portion of the pipe may be moved; means adjustable along said bars connecting said platforms respectively to said bars to support said platforms and enable adjustment of said platforms toward and away from the center of the working zone; a plurality of substantially horizontal fingers extending in said racking zone so as to have the free ends thereof faced toward said platforms, said fingers defining spaces to receive the upper portions of said pipe and sufficiently close to the level of said platforms as to provide footrests on which the workman may stand; hinges connecting the ends of said fingers to said derrick structure so that they may be swung into retracted positions with relation to said racking space; and a stop extensible from one of said platforms into the path of movement of the upper portion of said pipe from said working zone to said racking zone against which said pipe may be rested.

15. In a derrick having the upper part thereof formed so as to define a rectangular derrick area, the combination of: a pair of platforms, each extending in from the intermediate portion of an opposite side of the derrick structure with the front and rear ends thereof spaced from the ends of the derrick area and the inner edges thereof spaced apart, so as to define in the opposite ends of said derrick area respectively working and racking zones which extend substantially full width of the end portions of the derrick area, and a relatively narrow mouth connecting said zones through which the upper portion of a pipe may be passed from one of said zones to the other, platforms having their inner edges spaced so that a workman can stand straddling said mouth; and racking guides in said racking zone in spaced relation to the rear ends of said platforms so as to provide a lateral pipe passage communicating intermediate its ends with said mouth.

16. In a derrick structure having an upper framework defining a working zone and a racking zone having a common side, the combination of: a pair of confronting platforms extending along the common side and positioned in spaced apart relation to define a contracted passage connecting said zones through which the upper portion of a pipe may be passed from one of said zones to the other, and a plurality of substantially horizontal spaced apart fingers in the racking zone defining spaces to receive the upper portions of said pipe, said fingers being similarly disposed in relation to each of said platforms.

17. In a derrick structure having an upper framework defining a working zone and a racking zone, the combination of: a pair of confronting platforms common to said zones and positioned in spaced apart relationship to define a contracted passage connecting said zones through which the upper portion of a pipe may be passed from one of said zones to the other, and a plurality of substantially horizontal spaced apart fingers in the racking zone defining spaces to receive the upper portions of said pipe, said fingers being supported and extending in the same direction with reference to said platforms.

18. In a derrick structure having an upper framework defining a working zone and a racking zone, the combination of: a pair of confronting platforms of substantially the same shape and area common to said zones and positioned in spaced apart relationship to define a contracted passage connecting said zones through which the upper portion of a pipe may be passed from one of said zones to the other, and a plurality of substantially horizontal spaced apart fingers in the racking zone defining spaces to receive the upper portions of said pipe, said fingers being supported and extending in the same direction with reference to said platforms.

19. In a derrick structure having an upper framework defining a working zone and a racking zone, the combination of: a pair of confronting platforms common to said zones and positioned in spaced apart relation to define a contracted passage connecting said zones through which the upper portion of a pipe may be passed from one of said zones to the other, and a plurality of spaced fingers extending into areas of the racking zone lying on each side of the extended axis of said contracted passage to define spaces therein for receiving the upper portions of said pipe.

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