April 17, 1956 L. PATTERSON 2,742,260

WELL DERRICK

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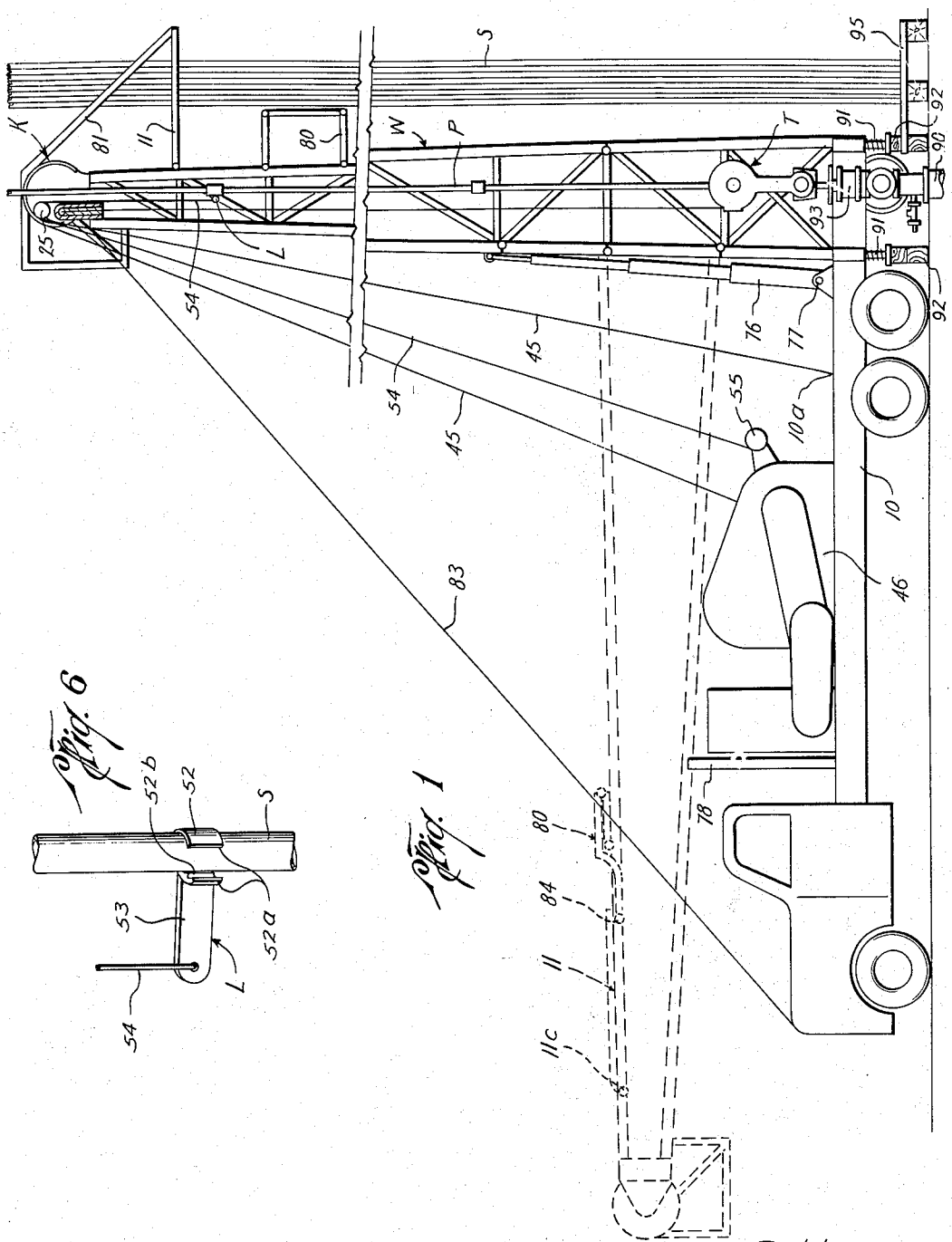


Fig. 1

Fig. 6

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WELL DERRICK

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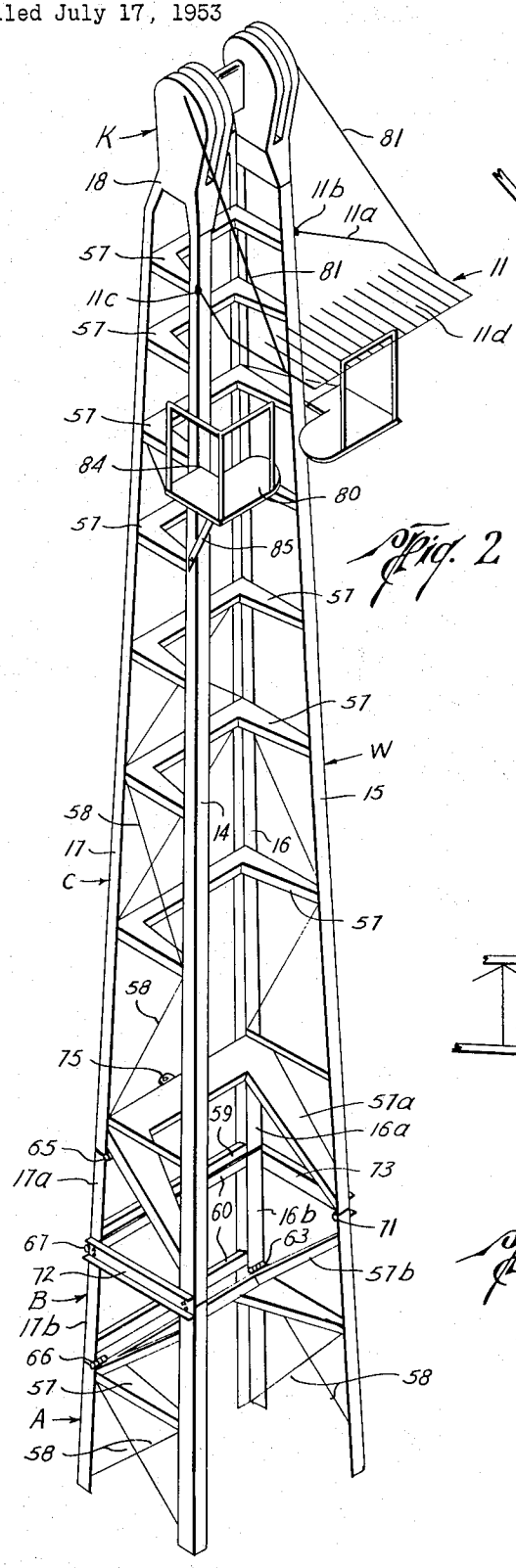


Fig. 2

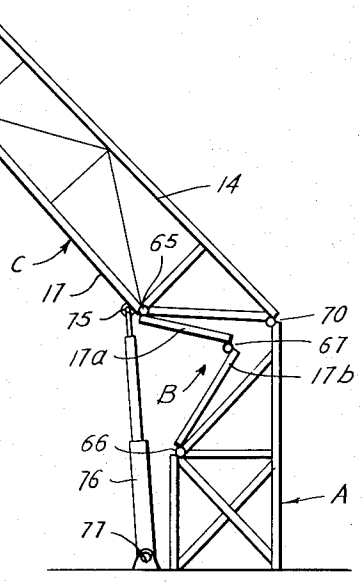


Fig. 9

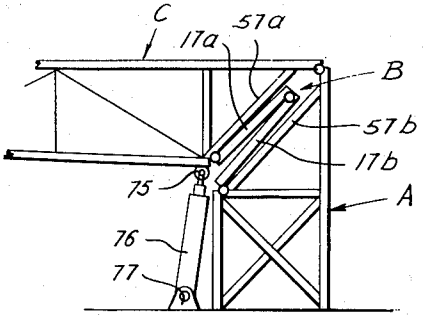


Fig. 10

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WELL DERRICK

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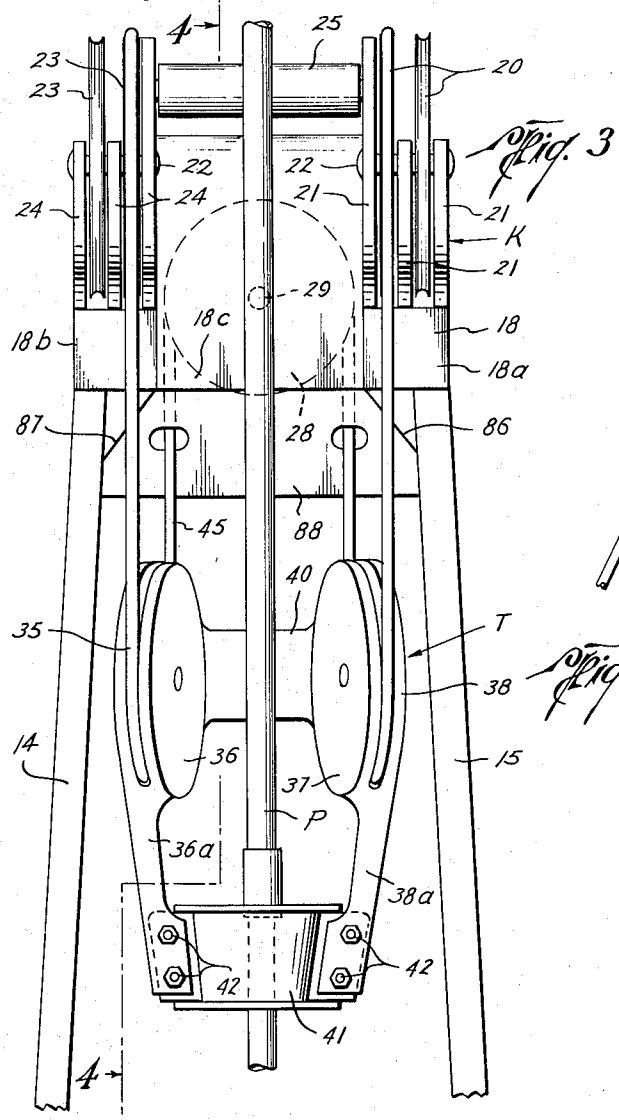


Fig. 3

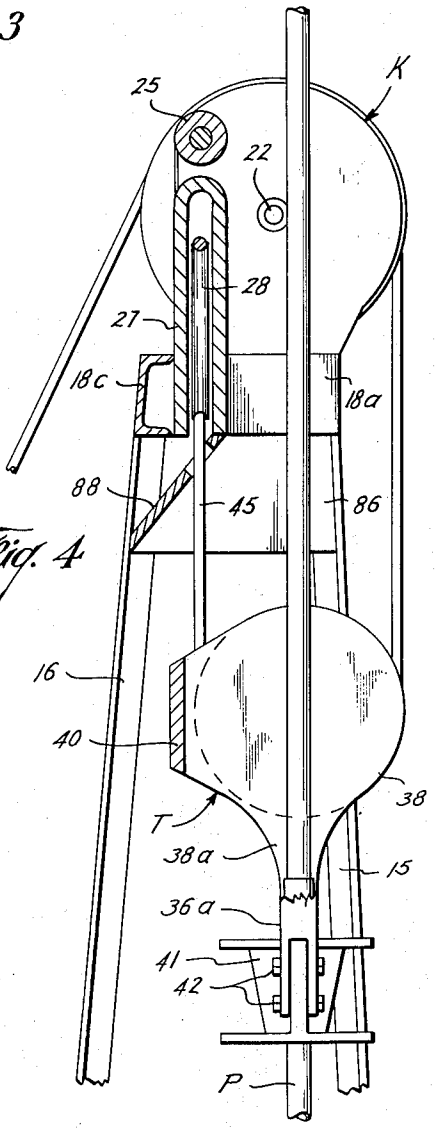


Fig. 4

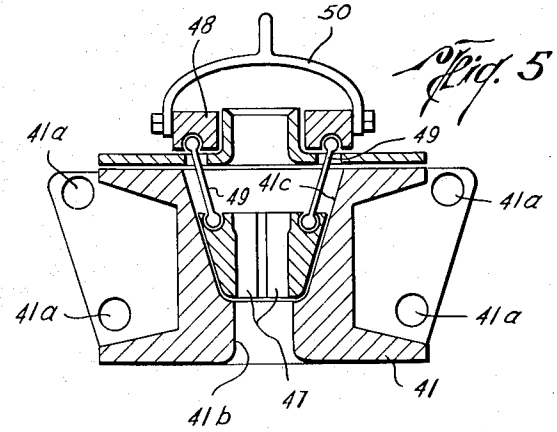


Fig. 5

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WELL DERRICK

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Fig. 7

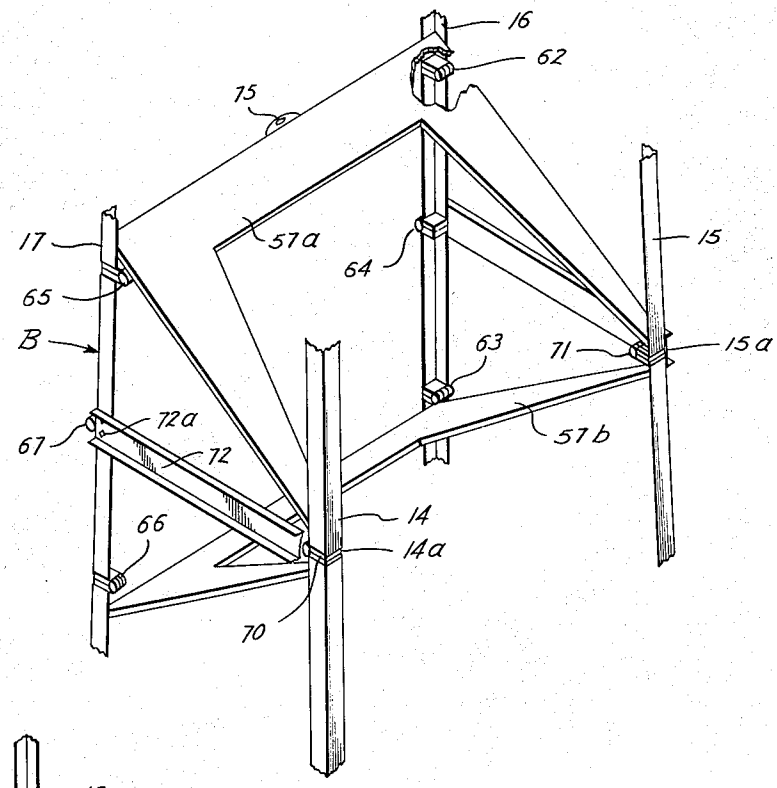
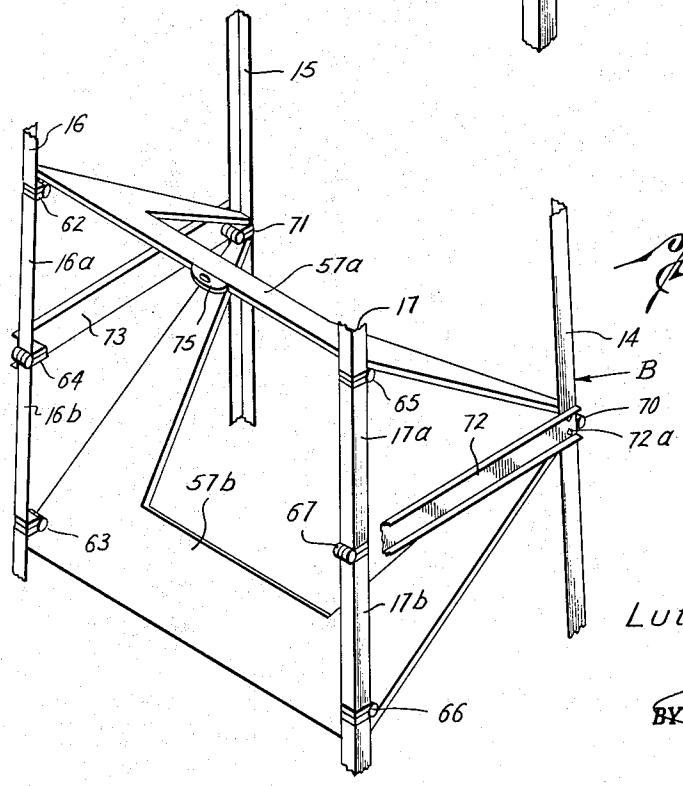


Fig. 8



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United States Patent Office 2,742,260 Patented Apr. 17, 1956

2,742,260

WELL DERRICK

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Application July 17, 1953, Serial No. 368,781

10 Claims. (Cl. 254—139)

This invention relates to new and useful improvements in well derricks.

In the drilling or servicing of oil or water wells or the like, the height of the well derricks used for handling well pipe such as drill pipe, casing and tubing has been determined primarily by the lengths of the sections or stands of pipe added to or removed from the pipe already in the well bore. This results from the construction of the conventional crown block assembly and traveling block on the derrick in such a manner that the well pipe cannot extend above the crown block without bending or distortion of the well pipe.

A reduction in the height of the derrick while maintaining adequate support for the stands of well pipe being handled is particularly desirable since it results in a reduced cost of the initial constructon, less weight for portability, a light and simple unit to set up at the well site, and less resistance to wind when raised. The advantages of a derrick of reduced height becomes even more evident in portable well derricks, because in the transportation of the derrick from one well site to another, the length of trailers and the objects they carry on the highways is limited by State law. If the derrick is so high that its length when in a horizontal position exceeds the limits imposed by the State, the derrick must be at least partially disassembled or must be telescoped. In some instances efforts have been made to handle lengths of pipe longer than the height of the derrick by bending or distorting the upper end of the pipe around the crown block with the result that the pipe is not suspended in a truly vertical position throughout its length and therefore the line of pull on the pipe is not in line with the pipe. This has been found to be impractical and of course results in difficulties when attempting to bend or distort the pipe.

It is, therefore, an object of this invention to provide an improved well derrick which is capable of handling stands of well pipe wherein the height of the derrick is considerably less than the length of said stands.

An important object of this invention is to provide in a well derrick an improved crown block and an improved traveling block which are so constructed that sections or stands of well pipe of greater lengths than the height of the derrick can be raised or lowered therein.

Another object of this invention is to provide in an improved portable well derrick, an improved means for folding the derrick from a substantially vertical position for use at a well site to a substantially horizontal position for transportation from one well site to another, said folding means effecting a shortening of the length of the derrick when in said horizontal position as compared to its height when in said vertical position.

A further object of this invention is to provide an improved crown block and an improved traveling block for a well derrick which are adapted to support a well pipe which projects above the crown block without bending or distorting the pipe by providing an arrangement

wherein the pipe being hoisted from the well is supported below and in vertical line with an open section of the crown block, whereby the pipe is suspended vertically throughout its length so that a direct line of pull can be applied on the pipe.

A still further object of this invention is to provide a strong, light-weight derrick with an open top and an open front whereby well pipe can be hoisted above the crown block and racked in lengths or stands which are longer than the derrick is tall; said derrick being foldable into a minimum height and length to conform to maximum dimensions for transporting.

The construction designed to carry out the invention will be hereinafter described together with other features thereof.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings forming a part thereof, wherein an example of the invention is shown, and wherein:

Figure 1 is an elevational view of the derrick of this invention as mounted upon the bed of a truck, with the solid lines indicating the derrick in its position for use at a well site and the dotted lines indicating the derrick in its substantially horizontal position for transportation.

Figure 2 is an isometric view of the derrick of this invention, illustrating particularly its open side and open upper end.

Figure 3 is an elevational view of the upper end of the derrick of this invention, illustrating in detail the improved crown block assembly and the improved traveling block of this invention.

Figure 4 is a view taken on a line 4—4 of Figure 3 and further illustrates details of the improved crown block assembly and the improved traveling block.

Figure 5 is a view, partly in elevation and partly in section, illustrating one type of elevator which may be used for supporting the well pipe in the derrick of this invention.

Figure 6 is a view illustrating one type of light elevator which may be used for swinging the stands or sections of the well pipe from the pipe rack to the derrick, or vice-versa.

Figure 7 is an isometric view of the folding section of the derrick of this invention.

Figure 8 is an isometric view of the folding section of the derrick of this invention taken from the rear side of the view shown in Figure 7.

Figure 9 is a diagrammatic view illustrating the collapsing or folding of the folding section of the derrick in an intermediate position between the vertical and horizontal positions.

Figure 10 is a view similar to Figure 9, but illustrating the folding section after the derrick has been lowered to a substantially horizontal position for transportation purposes.

In the drawings, the letter W designates generally the improved well derrick of this invention which is formed of three basic sections, a lower section A, an intermediate or folding section B, and an upper section C. The lower section A is adapted to be mounted upon the ground, or if the derrick is portable, upon a truck or trailer bed 10 (Figure 1). As will be explained, the folding section B permits the derrick to be folded from a substantially vertical position (solid lines in Figure 1) to a substantially horizontal position (dotted lines in Figure 1). The entire derrick has one side thereof open to facilitate the handling of stands or sections of well pipe S from the well derrick W to a pipe rack 11 and vice-versa, with the rack 11 being pivotally connected to the upper end of the derrick. The upper end of the upper

section C of the derrick is also open and this is provided for by the improved crown block assembly K from which is suspended an improved traveling block T. The particular construction of the crown block assembly K and the traveling block T permits stands or sections S of well pipe of greater length than the height of the derrick W to be handled without bending or distortion of the well pipe so that a direct line of pull or a substantially vertical support is provided at all times for the well pipe P suspended from the derrick.

The well derrick W is formed with four derrick legs or uprights **14**, **15**, **16** and **17**, the upper ends of which are joined together by a water table **18**, which is formed in a U shape or similar shape such as a V shape by two substantially parallel sections **18***a* and **18***b* and a central section **18***c* which is connected therebetween and is substantially perpendicular thereto. The table section **18***a* is connected to the upper ends of the derrick legs **15** and **16** while the table section **18***b* is connected to the derrick legs **14** and **17**. The central table section **18***c* is connected to the derrick legs **16** and **17**, so that the water table **18** is formed with a substantially unrestricted open area therebetween and an open side between the derrick legs **14** and **15**.

The crown block assembly K is mounted on the water table **18** and includes one or more sheaves **20** rotatably supported in brackets **21** through which the sheave pin **22** extends, whereby one or more of the sheaves **20** are supported on the pin **22**. On the other table section **18***b* there is mounted one or more sheaves **23** in brackets **24** which support the pins **22** extending therethrough and through the center of the sheaves **23**. Preferably, the sheaves **20** are parallel to the sheaves **23** and a space or area which is unrestricted is formed between such sheaves **20** and **23** (Figure 3) which area or space is substantially equal to the open area between the table sections **18***a* and **18***b*. The inner support brackets **21** and **24** are preferably connected to a roller **25** which is set back from the central open unrestricted area between the sheaves so as not to interfere with any well pipe passing into that area. This roller **25** serves to balance well pipe as it is being moved from the well derrick to the pipe rack **11**, as will be explained.

Below the roller **25** and between the sets of sheaves **20** and **23**, a sheave bracket **27** is connected for the support of one or more sheaves **28** which is substantially perpendicular to the sheaves **20** and **23**, this sheave **28** being supported on a sheave pin **29** which extends through the sheave **28** and bracket **27** in the usual manner. It will be apparent from Figure 4 that the sheave **28** is offset to the rear of the water table **18** so as to be substantially adjacent to the central table section **18***c*, whereby the sheave **28** does not interfere with the substantially open and unrestricted area between the table sections **18***a* and **18***b* or the area between the sheaves **20** and **23**.

The traveling block T includes one or more sheaves **35** mounted for rotation in a bracket **36** and one or more sheaves **37** mounted in a bracket **38**. The brackets **36** and **38** shown as connected at their inner surfaces with a connecting bar **40** extending therebetween and offset to the rear thereof (Figure 4) so as to provide a substantially open and unrestricted area between the sheaves **35** and **37**. The brackets **36** and **38** have depending extensions **36***a* and **38***a*, respectively, which are connected to an elevator body **41** by means of bolts **42** or an equivalent securing means. In some instances the bar **40** may be omitted as the elevator body **41** will serve to maintain the brackets **36** and **38** properly spaced.

A cable **45** having one end thereof wound about a drawworks **46** (Figure 1) extends upwardly from the drawworks around one or more of the sheaves **23** and then extends downwardly through the sheave **35** on the traveling block T and then passes upwardly over the intermediate block **28** where it is directed downwardly for passing through the sheave **37** and then upwardly over one of the sheaves **20**. The cable is led from the sheave **20** to a fixed connection **10***a* so as to form the dead end of the cable **45**. Thus, a raising and lowering of the traveling block T is controlled by the paying out and reeling in of the end of the cable **45** connected to the drawworks **46**. In some instances, the traveling block T may have more than one of each of the sheaves **35** and **37** and in that event, more than one of each of the sheaves **20** and **23** and an additional sheave at **28** will be utilized.

It will be understood that even though only an elevator body **41** has been illustrated in Figures 3 and 4, some type of elevator must be employed for the handling of the well pipe string P for the addition and removal of the stands of pipe S therefrom. One type of such construction is shown in Figure 5 wherein the elevator body **41** is formed with bolt holes **41***a* through which the bolts **42** extend. The central portion of the body **41** has a bore **41***b* therethrough which is shaped at its upper end in the form of a bowl **41***c* for the reception of pipe gripping dog segments **47** which are pivotally supported from a ring **48** through links **49**. A control lever **50** is connected to the ring **48** for the raising and lowering of the dog **47** when such manual manipulation is necessary. The particular type of elevator shown in Figure 5 is known as an automatic elevator since it is constructed so that the dogs **47** ride up and outwardly in the elevator bowl **41***c* as the elevator is lowered and passes over a collar connecting several sections of the well pipe P, but upon raising of the elevator the dogs **47** contact the lower end of the collars of the well pipe P to support same for the raising or lowering of the well pipe in the derrick.

For the swinging of a stand of pipe S from the well derrick to the pipe rack **11**, or vice versa, the light elevator L of the type shown in Figure 6 may be employed. The light elevator has a split ring **52** with the ends **52***a* thereof spaced from each other a sufficient distance to readily permit the stand pipe S to pass therethrough for positioning within the split ring **52**. The internal surface of the split ring **52** has a plurality of sharp knife edges **52***b* which are adapted to engage the pipe when the arm **53** connected to the ring **52** is raised by the light line **54** connected thereto. Such line **54** extends upwardly and over the roller **25** and has its other end connected to the cathead **55** on the drawworks **46** for the shifting of the stand of pipe S to be removed or added to the string of pipe P, as will be explained.

Below the crown block assembly K and the water table **18**, the derrick legs **14**, **15**, **16** and **17** are interconnected and made rigid by a plurality of lateral U-shaped braces **57** (Figure 2). These braces **57** are substantially horizontal when the derrick is in a vertical position and each of the braces **57** extends from the derrick leg **14** to the leg **17** and from there to the leg **16** and from there to the derrick leg **15**, but there is no portion of the brace spanning the area between the legs **14** and **15**, whereby that side of the derrick is open or unrestricted. The side braces **58** extending diagonally from one lateral brace **57** to the next may be also employed for additional rigidity and strength, but at no time will any of the braces **57** or **58** extend between the derrick legs **14** and **15**.

As previously mentioned, the derrick is constructed with an intermediate leg section B which is adapted to permit the folding of the legs of the derrick in order to move the derrick from a vertical position to a horizontal position, or vice versa. This is particularly desirable if the derrick is to be portable and is mounted upon a truck or trailer bed such as the truck bed **10** illustrated in Figure 1. This derrick folding section B (Figures 2, 7 and 8) includes an upper folding panel formed of leg segments **16***a* and **17***a* which, if desired, may be joined by lateral braces **59** (Figure 2) and diagonal braces, not shown. It also includes a lower folding panel which is

made up of leg segments **16***b* and **17***b* and if desired of lateral braces **60** (Figure 2) and diagonal braces, not shown. For clarity of illustration, the diagonal braces have been omitted entirely and the lateral braces **59** and **60** have been omitted from Figures 7 and 8. The upper end of the leg segment **16***a* is pivotally connected to the rest of the leg **16** by a hinge **62** and the lower end of the leg segment **16***b* is pivotally connected to the rest of the leg **16** by a hinge **63**, with the pivot portions of the hinges **62** and **63** being on the inner side of the leg and leg segments. The leg segments **16***a* and **16***b* are pivotally connected together by a hinge **63** which has its pivot point exteriorally of the leg segments. The leg segments **17***a* and **17***b* are connected to the leg **17** in an identical manner with the connection of the segments **16***a* and **16***b* to the leg **16** and therefore include a hinge **65** connecting the upper end of the leg segment **17***a* to the rest of the leg **17** and a hinge **66** connecting the lower end of the leg segment **17***b* to the rest of the leg **17** and a hinge **67** connecting the segments **17***a* and **17***b* together. The leg **14** is split at **14***a* to receive a hinge **70** for pivotally connecting the portions of the leg **14** thereabove and therebelow together. Similarly, the leg **15** is split at **15***a* to form two sections which are pivotally connected together by a hinge **71**. These hinges **70** and **71** have their pivotal portions on the inner side of the legs and they are in substantially the same horizontal plane as the hinges **67** and **64**, when the derrick is in a vertical position.

When the derrick is in a vertical position, side removable braces **72** and **73** are provided, with the brace **72** extending from the leg **14** to the leg **17** and having bolts **72***a* extending through the legs **14** and **17** to prevent any inadvertent folding of the derrick structure. Similarly, the brace **73** extends between the derrick legs **15** and **16** and is secured thereto by bolts (not visible). To reinforce the folding section B, while not interfering with the folding thereof, the U-shaped braces **57***a* and **57***b* are provided, with the brace **57***a* being substantially identical with the other braces **57**, but being inclined and being connected to the legs **16** and **17** above the hinges **62** and **65**, respectively, and also being connected to the legs **14** and **15** above the hinges **70** and **71**. The brace **57***b* is inclined at an opposite angle to the brace **57***a* and is connected to the derrick legs below the hinges **63**, **66**, **70** and **71**. The brace **57***a* has a hook or eyelet **75** thereon for connection with a hydraulic or mechanical jack **76** which is pivotally connected to the truck bed **10** (Figure 1) by a pivotal connection **77**, or is mounted pivotally upon any other suitable support. If desired, a plurality of jacks **76** may be utilized; for example, if two jacks are used, one could be connected to leg **16** and the other to leg **17** so that more substantial support for raising and lowering is provided as compared to the use of the one jack **76** as illustrated. Thus, the upper section C of the derrick is directly connected to the hydraulic jacks **76**.

When it is desired to fold the derrick from a vertical to a horizontal position, the side removable braces **72** and **73** are detached from the derrick legs and the hydraulic jack or jacks **76** are lowered to lower the upper derrick section C. As the upper section C is lowered, the upper and lower panels of the folding section B move inwardly by pivoting about their hinges (Figure 9), and such lowering of the upper section C continues until the upper section C is in a substantially horizontal position (Figure 10) at which time the upper and lower folding leg panels of the folding sections B are substantially parallel to each other and are folded between the inclined braces **57***a* and **57***b*. To support the derrick in its horizontal position, a vertical support **78** mounted on the truck bed **10** may be provided (Figure 1). By reason of the fact that the crown block assembly K and the traveling block T of this derrick are constructed to handle stands of well pipe which are of greater length than the height of the derrick, the derrick can be constructed of a length such that when in its folded or horizontal position, it is of a short enough length to meet the requirements of State law for transportation purposes on the highways. Also, it is of sufficiently low height when folded to meet the State requirements and to be able to pass under normal underpasses and similar obstructions. The width of the derrick can also be of sufficient size so as to meet State requirements and it generally will not exceed the width of the trailer or truck bed **10**.

In order to further reduce the height of the derrick when in a folded position, the pipe rack **11** and the derrickman's stand **80** are also pivoted to the derrick legs so as to be disposed in a substantially horizontal position (Figure 1) when the derrick is so positioned for transportation. The pipe rack **11** includes an outer frame **11***a* which is pivotally connected at **11***b* and **11***c* and which is supported by a pair of cables **81** extending from the upper end of the derrick. Fingers **11***d* are provided with the frame **11***a* so as to form spaces therebetween for the reception of the stands S of pipe when not in use. To counterbalance the weight of the stands S when racked in pipe rack **11**, a guy wire **83** is usually provided for connection with the forward end of the truck or some other support (Figure 1). The derrickman's stand **80** includes a pivotal connection **84** and all of the links thereof are pivoted so that the stand can be swung to a horizontal position as shown in Figure 1 and may be raised to a position for use as shown in Figure 2 with a removable brace **85** being bolted thereto to prevent the pivoting during such use. The details of the pipe rack **11** and the derrickman's stand **80** may be varied so long as the pivoting thereof can be effected.

In the use or operation of the derrick of this invention, the derrick is transported to the well site on the truck bed **10**, or a trailer bed or any similar portable device, and then is moved from its horizontal transportation position to a substantially vertical position over the well **90** by a raising of the jack or jacks **76** (Figure 1). The rear of the truck bed **10** can be supported upon mechanical jacks **91** mounted upon blocks **92** positioned on the ground or other support. With the derrick in its vertical position, the removable side braces **72** and **73** are bolted in place to prevent folding of the structure during use.

Assuming that the well pipe is in the well **90** and is being held therein by the usual slips **93**, the removal of such pipe from the well would then be effected. First, the traveling block T would be lowered until the automatic elevators such as that shown in Figure 5 engage the tool joint or collar of the well pipe P projecting above the slips **93**. The slips **93** are then released and by the operation of the drawworks **46**, the traveling block T is raised, thereby raising the well pipe P a sufficient distance to expose another tool joint or collar on the well pipe P, at which time, the slips **93** are again set and the traveling block T is lowered until the elevators engage the second exposed tool joint or collar. The elevators at the bottom of the traveling block T then engage with such second exposed tool joint or collar and the well pipe is then again raised by raising the traveling block T. This continues until two or more sections of the well pipe which form a stand S are exposed above the slips **93**. Because of the open structure of the crown block assembly K, the well pipe can extend considerably above the upper end of the derrick without any necessity for a distortion or bending thereof and while permitting a direct pull to be applied to the well pipe for the raising of same. By raising a multi-joint stand S, considerable time is saved over the usual system, with this size derrick, of disengaging and handling each joint individually. It should be noted that inclined guide plates **86**, **87** and **88** are provided below the water table sections **18***a*, **18***b* and **18***c*, respectively, so as to guide the upper end of the well

pipe P through the open area of the crown block K. With a stand of pipe thus raised above the slips **93** and with the upper end thereof projecting above the upper end of the crown block assembly K, the light elevator L is attached to the well pipe at the upper end thereof by the derrick man working on the derrickman's platform or stand **80**. The lower coupling in the vicinity of the traveling block T and above the slips **93** is then threaded out so that the portion of the well pipe P which forms a stand S above the slips **93** is detached from the portion of the well pipe being held by the slips **93** within the well **90**. The load of the stand of pipe thus detached is then carried by the light elevator L with the knife edge **52***b* thereof gripping the exterior of the pipe to prevent slippage of same and any necessary raising of the pipe being effected by the operation of the cathead **55** to effect a moving of the line **54** connected to the light elevator. The derrick man on the platform **80** then swings the released stand of pipe so that the upper end thereof contacts the roller **45** and the lower end is brought over onto a platform **95**. Thereafter, the upper end of the stand of pipe S is positioned between two of the fingers **11***d* of the rack **11**. The traveling block T is then in a position to repeat the above sequence of operations in order to raise another stand S of pipe from the well. Such sequence of steps or operations is continued until all of the well pipe which is desired to be removed from the well has been removed and positioned as stands S in pipe rack **11** alongside of the derrick.

When it is desired to add the stands of pipe S to the well pipe P in the well, the above sequence of steps or operations is reversed by swinging a section of stand S from the pipe rack **11** with the light elevator to a position over the well **90** and connecting the same into the well pipe in the well, while the elevators are below the coupling of the pipe joint resting in the slips. The elevators are manually released above this coupling. The traveling block T is raised so that the elevators engage the middle tool joint or coupling and then the traveling block T assumes the full support of the well pipe, and the slips are disengaged. The traveling block T is then lowered until it is substantially in the vicinity of the slips **93**. The slips are then set, the elevators are manually released, raised above the middle coupling by the winch, and subsequently raised up to the top joint in the stand to engage the top coupling in stand S. The traveling block T again assumes the full support of the well pipe, the slips are disengaged, the traveling block T is lowered again to the vicinity of the slips **93**, slips are set, and another stand of pipe S is added to the well pipe string P in the well, in the same manner.

From the foregoing, it is believed evident that the improved crown block assembly and the improved traveling block are so constructed that the upper end of the derrick is open so that lengths of well pipe can be handled therein which are greater in length than the height of the derrick structure. The open side of the derrick permits the pipe to be racked along side of the derrick and is particularly advantageous in its use with the open crown block assembly. It is also believed evident that the folding structure of the legs of the derrick permits the derrick to be folded from a vertical position to a horizontal position for transportation with a single lowering movement and with relative ease and simplicity. By reason of the folding feature of the derrick of this invention and the open crown block assembly of this invention, the derrick is especially suitable for use as a portable derrick, because it can handle lengths of pipe substantially equal to the lengths of pipe normally handled by taller portable derricks and fixed or "permanent" derricks, while at the same time the length of the derrick when in a horizontal position can be short enough to meet the requirements of State law for transportation of same.

The foregoing disclosure and description of the invention is illustrative and explanatory thereof and various changes in the size, shape and material, as well as in the details of the illustrated construction can be made, within the scope of the appended claims, without departing from the spirit of the invention.

What is claimed is:

1. A well derrick adapted to handle lengths of pipe of greater length than the height of said derrick, comprising four derrick legs having braces connecting said legs to form a four-sided derrick, said braces joining said legs on only three of the four sides leaving an open side on the derrick through which well pipe can be passed to and from the derrick, a substantially U-shaped water table secured on the upper ends of the derrick legs with the open portion of the substantially U-shaped water table being on the same side of the derrick as said open side, a crown block assembly having a side sheave mounted on each of the two parallel sections of the substantially U-shaped water table with an open area therebetween of substantially the same shape and size as the open area of said U-shaped water table, each of said side sheaves of said crown block assembly being mounted on stub shafts which terminate outside of said open area of said water table, and said crown block assembly also including a cross sheave mounted on the rear or closed end of the water table substantially perpendicular to said parallel sections of the water table and rearwardly of said open area of the water table to enable a support line to be passed over said cross sheave from one of the side sheaves to the other of the side sheaves without passing through or obstructing said open area of said open side of the water table, whereby a well pipe can be passed upwardly through the open area of said U-shaped water table and the open area between said sheaves without distortion or bending of the pipe.

2. The structure set forth in claim 1, including a traveling block suspended by the support line from said crown block assembly and having a set of two or more sheaves connected together with an open area therebetween of substantially the same size and shape as said open area in said water table.

3. A well derrick including, a structural framework having a central unobstructed passage extending throughout its length which passage is aligned with the well bore over which the derrick is disposed, a crown block assembly at the upper end of the derrick having an opening therethrough in alignment with the central passage, a travelling block assembly adapted to be movably suspended from the crown block assembly and adapted to traverse the central unobstructed passage, said travelling block assembly having a central opening therethrough which is in alignment with the central passage, whereby a well pipe being inserted within or removed from the well bore may extend within the central passageway and through both the travelling block and the crown block assemblies.

4. A well derrick as set forth in claim 3, wherein one side of the structural framework of the derrick is open to communicate with the central unobstructed passage to facilitate the insertion and removal of pipe into and from said passage.

5. A well derrick as set forth in claim 3, together with means secured to the travelling block assembly for engaging a well pipe extending through said assembly to raise and lower said pipe within the well bore.

6. A well derrick as set forth in claim 3, wherein the travelling block assembly comprises a pair of sheaves which are spaced from each other on opposite sides of the central unobstructed passage, and means connecting the travelling block sheaves to each other with said connecting means having a central opening aligned with the central passage and also including a coupling device for connecting the travelling block assembly to a well pipe, whereby said pipe may be suspended from the travelling block assembly.

7. A well derrick including, a structural framework having a central unobstructed passage extending through-

out its length, a crown block assembly comprising at least one sheave at the upper end of the derrick, means for mounting said sheave at one side of the unobstructed passage, said mounting means terminating outside of said unobstructed passage so as to permit the vertical movement of well pipe in said passage above said sheave and adjacent to said mounting means, and a travelling block assembly including a pair of sheaves adapted to be suspended within the central passage by means of a cable which passes over the crown block sheave, and around the travelling block sheaves, said travelling block sheaves being spaced from each other and located out of alignment with the central unobstructed passage, whereby a well pipe may extend upwardly within the central passage and through both the travelling block and the crown block.

8. A well derrick including, a structural framework having a central unobstructed passage extending throughout its length, a crown block assembly comprising a pair of side sheaves spaced from each other on opposite sides of said passage, a traveling block assembly including a pair of sheaves which are located on opposite sides of said central passage, an additional sheave mounted at the upper end of the derrick as part of the crown block assembly and disposed substantially perpendicular to the sheaves of the traveling block and located at one side of the unobstructed passage, a cable threaded over one of the crown block side sheaves, over one of the traveling block sheaves, thence around said additional sheave, thence over another of the traveling block sheaves, and thence over the other side of the crown block sheave, whereby the cable suspends the traveling block assembly and permits it to be raised and lowered within the central unobstructed passage and whereby said additional sheave crosses said cable from one side of said passage to the other without obstructing said passage.

9. A well derrick as set forth in claim 8, together with means connected with the traveling block sheaves for connecting the traveling block assembly with a well pipe extending through the central passage, whereby said traveling block may be utilized to raise and lower said well pipe.

10. A well derrick including, a structural framework having a central unobstructed passage extending throughout its length and an open side through which a well pipe can be laterally moved, a crown block assembly comprising a pair of side sheaves spaced from each other on opposite sides of said passage, means mounting said side sheaves on said framework, said mounting means terminating outside of said central unobstructed passage whereby the area between said side sheaves is unobstructed, a traveling block assembly including a pair of sheaves which are located on opposite sides of said central passage, an additional sheave mounted at the upper end of the derrick as part of the crown block assembly and disposed substantially perpendicular to the side sheaves of the crown block assembly and located at one side of the unobstructed passage and on the closed side of the derrick framework opposite to said open side for guiding and suspending a support line across from one side sheave to the other side sheave without obstructing said passage or said open side, a support line extending over the crown block side sheaves and said additional sheave and extending downwardly therefrom around said traveling block sheaves for suspending the traveling block assembly from said crown block assembly for raising and lowering same within the central unobstructed passage.

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