

W. A. MacKENZIE.
EXTENSION SELF LOCKING PORTABLE DERRICK.
APPLICATION FILED MAY 7, 1908.

910,210.

Patented Jan. 19, 1909.

2 SHEETS—SHEET 1.

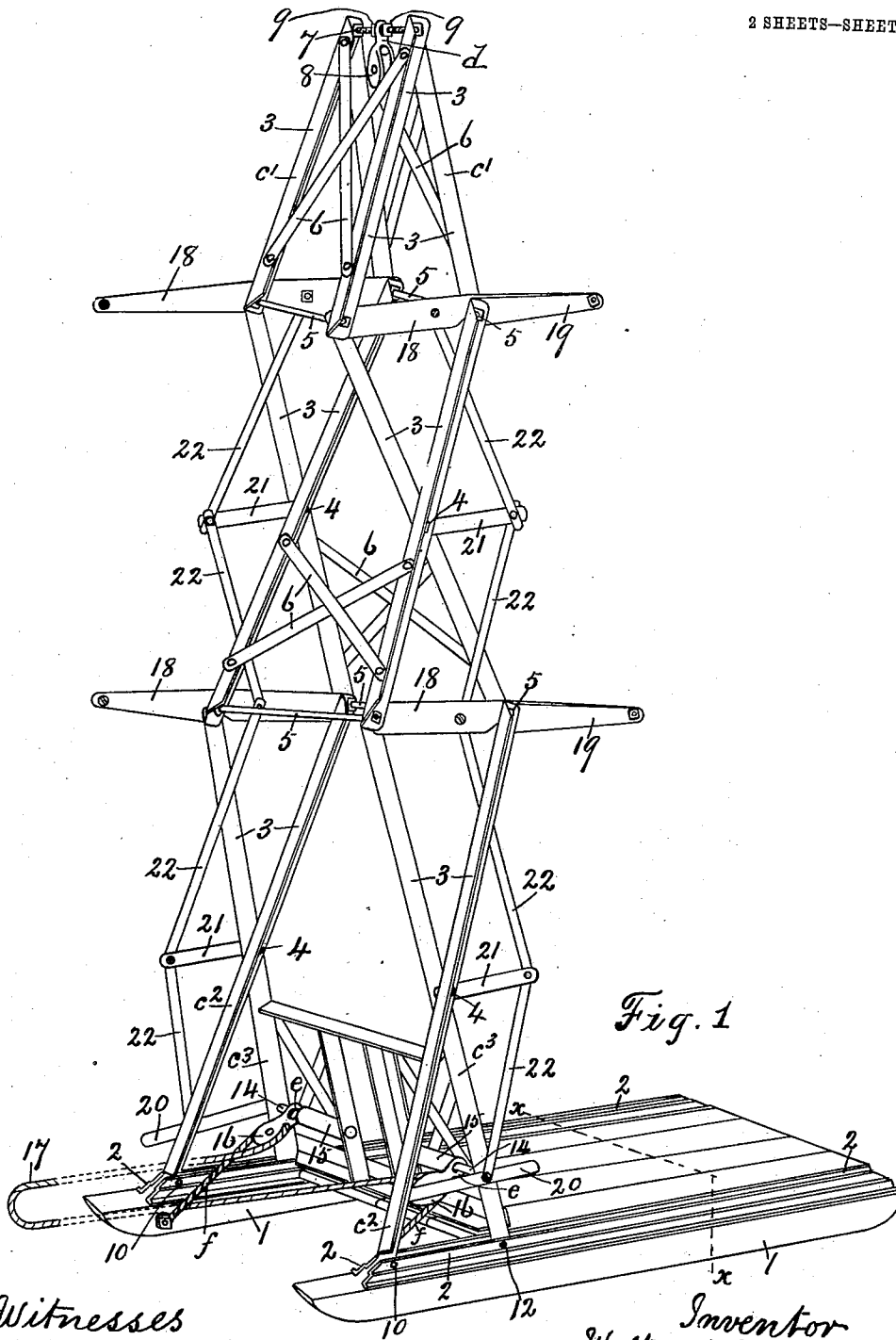


Fig. 1

Witnesses
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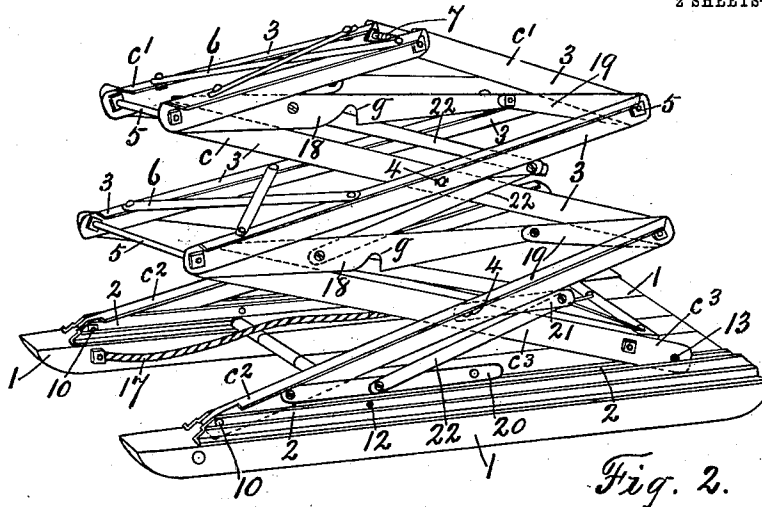


Fig. 2.

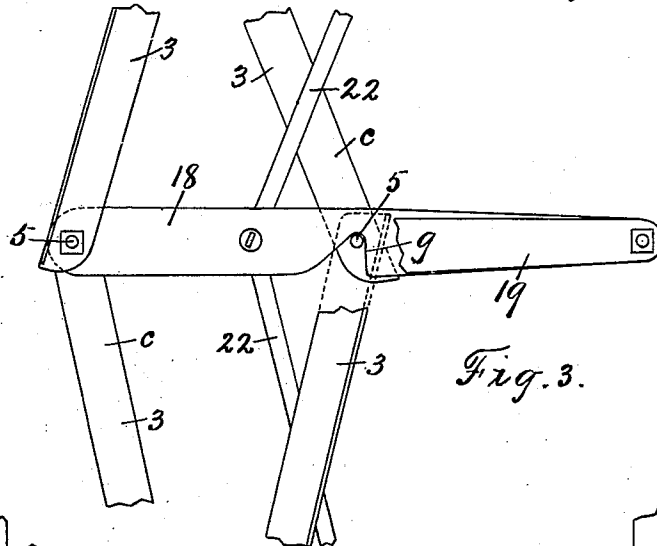


Fig. 3.

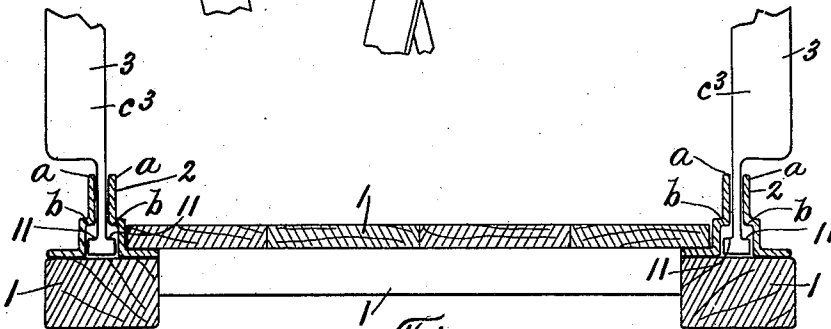


Fig. 4.

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UNITED STATES PATENT OFFICE.

WALTER ANGUS MacKENZIE, OF PETROLEA, ONTARIO, CANADA, ASSIGNOR OF ONE-HALF TO
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EXTENSION SELF-LOCKING PORTABLE DERRICK.

No. 910,210.

Specification of Letters Patent.

Patented Jan. 19, 1909.

Application filed May 7, 1908. Serial No. 431,527.

To all whom it may concern:

Be it known that I, WALTER ANGUS MacKENZIE, a subject of the King of Great Britain, and a resident of Petrolea, in the county of Lambton, in the Province of Ontario, Canada, have invented a new and useful Extension Self-Locking Portable Derrick, of which the following is a specification.

This invention relates to a device which is particularly adapted for hoisting pump rods and tubes and casings or linings for wells, and for hoisting and operating drill rods or cables and drilling tools or any well boring tools or appliances.

In the derricks in ordinary use for the purposes just indicated, the timbers of which they are composed are all rigidly secured together, and when so secured, and wishing to move or transport a derrick from one place to another, it must be transported in its upright position or the timbers of which it is composed must be dismembered or taken apart, and in practice it has been found that if the derrick is transported or moved in its upright position, its height makes it unwieldy, and consequently, not adapted to be moved from one place to another conveniently or with safety; and on the other hand, if dismembered, the dismembering or taking apart of the timbers of which the derrick is composed takes considerable time. Again, in order to permit the derricks in ordinary use, for the purposes indicated, to pass under overhead telegraph or telephone wires, more or less of the timbers of the derrick must be dismembered, and the timbers separated, and taken down before it will be adapted to pass under said wires, and even in this partial dismemberment more or less time is wasted, all of which is avoided and completely prevented by the use of my invention.

The object of my invention is to provide an improved device the upper end of which extends to a considerable height above the ground to adapt it to be employed in raising articles of considerable weight and length longitudinally, and one that, while it may be used with advantage for any purpose for which a derrick may be employed, is particularly adapted for hoisting pump rods and tubes and casings or linings for wells, and for hoisting and operating drill

rods or cables and drilling tools or any well boring tools or appliances. And a further object of this invention is, to provide a simple, strong, durable and light folding derrick for the purposes indicated, one that may be readily, easily and instantly extended or folded as desired, and one that when extended, is adapted to be locked and held in its elevated or extended position, and again to be unlocked to permit it to be folded to facilitate its transportation from one place to another. And this invention consists of the improved construction and novel combination of parts of the same as will be hereinafter first fully set forth and described and then pointed out in the claims.

Reference is had to the accompanying drawings forming part of this specification, wherein:—

Figure 1 is a perspective view of a derrick embodying my invention. In this view the derrick is shown in its extended position. Fig. 2 is another view of same showing the derrick folded. Fig. 3 is an enlarged detail side view of the locking bar, link and portions of two adjacent folding sections. Fig. 4 is an enlarged detail cross sectional view of the carriage and track on the line, *x, x*, of Fig. 1. In this view the ends of the adjustable lower folding section are shown.

In the accompanying drawings:—The numeral 1 indicates the base or platform of a truck or carriage, which may be mounted on runners or wheels as required or as preferred.

2, 2 indicate track rails which are located at opposite sides of and which are rigidly secured to said base or platform 1, and said rails are formed of two spaced apart plates *a, a*, each of which is provided with an oppositely arranged shoulder, *b*, on their adjacent sides, for the purpose which will be hereinafter set forth.

3, 3 indicate lazy-tongs or folding sections composed of a series of diagonal levers, *c*, which bisect one another and which are pivoted together midway between their ends on pivot bolts 4, and at their ends on pivot cross rods 5, and there are two sets of these folding sections or lazy-tongs 3 arranged one on each of the two opposite sides of the base or platform 1; and said pivot rods 5

extend across and assist in bracing and holding said oppositely disposed folding sections 3 spaced apart.

6, 6 indicate cross braces which extend across and are secured at their ends to the oppositely disposed folding sections 3, for the purpose of firmly holding and securing said folding sections parallel and at the position to which they are spaced apart, and said oppositely disposed folding sections 3 so held are adapted to be extended and contracted uniformly and simultaneously.

The diagonal levers, c' , of the upper folding sections 3 are not pivoted midway between their ends, but their upper ends are inclined towards one another and pivoted on a screw threaded pivotal cross rod 7; and 8 indicates a pulley suspended on this cross rod 7 by the loop or eye, d , and said pulley 8 is held in place midway between said spaced apart oppositely disposed folding sections 3 by the nuts 9 engaging with and adjustable on said screw threaded cross rod 7.

The lower front ends of the diagonal levers, c^2 , of the lower folding sections 3 are held in place and pivotally secured to the track rails 2 by the pivot bolts 10. And the lower rear ends of the diagonal levers, c^3 , of the lower folding sections 3, are provided with shoulders 11 which are fitted to and inserted between the plates, a , of the track rails 2, as shown in Fig. 4. When so placed the shoulders 11 of the diagonal levers, c^3 , engage with the shoulders, b , on the inner adjacent faces of the plates, a , of said track rails 2 to prevent the lower rear ends of said diagonal levers, c^3 , from becoming accidentally disengaged from the plates, a , of said track rails 2, at the same time the lower ends of said diagonal levers, c^3 , are adapted to move back and forth perfectly free between said plates, a , of said track rails 2, when required. Again by inserting a pin or bolt, not shown, in the holes 12 formed opposite one another in the plates, a , of the track rail 2 and through the hole 13 formed in the lower end of the rear diagonal lever, c^3 , when so secured together, when the folding sections 3 are extended, as shown in Fig. 1, assists in maintaining and firmly holding said folding sections 3 in their extended position.

14 indicates spindles mounted in the lower rear ends of the diagonal levers, c^3 , 15 rollers mounted on said spindles 14, and 16 pulleys which are suspended by the loops or eyes e , from the opposite ends of said spindle 14.

17 indicates a rope folded at the center, the ends f , of which extend over the pulleys 16, and are firmly secured one to each of the opposite sides of the base or platform 1, all as shown in Fig. 1, for the purpose which will be hereinafter set forth.

18 indicates locking-bars in the lower edge

of each of which a notch, g , is formed, and one of said locking bars 18 is pivoted at one end on each of the cross rods 5, and 19 is a link one end of one of which is pivoted to the other end of each of said locking bars 18, and the other end of one of each of said links 19 is pivoted on the adjacent end of each of the oppositely arranged pivot rods 5.

20 indicates a locking lever pivoted on one of the diagonal levers of the folding section 3, 21 arms one end of one of which is pivotally secured to each of the pivot bolts 4, which pivotally secure the diagonal levers together where they bisect one another, and 22 connecting bars which pivotally connect the lever 20, the arms 21 and the locking bars 18 together, as shown in Fig. 1, for the purpose which will be hereinafter set forth; and as shown in the accompanying drawings there is a set of arms 21, connecting bars 22, locking lever 20 locking bars 18 and links 19 on each of the two oppositely disposed and spaced apart folding sections 3.

Another rope, not shown, passes over the pulley 8 and one end of said rope extends down to the ground and is connected to the drill rod or cable or to the pump rod or tube or to the casing or lining, or to the well boring tool or appliance in use, and the other end of said rope extends down to the ground and under the roller 15 to the source of power used to operate a drill rod or cable or to hoist pump rods or tubes or other well boring tool or appliance.

The operation is as follows:—When the folding sections 3 are in the extended upright position shown in Fig. 1, by raising the levers 20, slightly, the notch portions, g , of the locking bars 18 are disengaged from the rods 5, when by holding the rope 17 taut and continuing this operation until the outer ends of the locking bars 18 and links 19 are slightly raised above the pivot rods 5 the folding sections 3 may be readily, easily and carefully lowered by permitting the rope 17 to pass through the hand and over the pulleys 16; until the folding sections 3 are in the folded position shown in Fig. 2. Again the extending of said folding sections 3 from the position shown in Fig. 2 to the position shown in Fig. 1, is readily and easily accomplished by drawing the rope 17 outwards over the pulleys 16 until the folding sections 3 are in the position shown in Fig. 1, when in this position the outer ends of the locking bars 18 and the links 19 are slightly above the pivot rods 5, when by pressing down on said lever 20, the outer ends of said locking bars and links are lowered until the notches, g , engage with the pivot rods 5, when the folding sections 3, will be firmly and securely locked in their upright position. And while said folding sections 3 are being adjusted from the posi-

tion shown in Fig. 2 to the position shown in Fig. 1, the lower ends, c^3 , being inserted between the plates, a, a , of which the track rails 2 are formed, and the shoulders 11 on said diagonal levers, c^3 , engaging with the shoulders, b , on the plates, a, a , avoids and completely prevents any possibility of the derrick from being thrown over by an impetuous operator swiftly adjusting the folding sections from their folded to their extended position. The result is that an improved device is provided which extends to some considerable height above the ground to adapt it to raise heavy pump rods or tubes and casings or linings for wells which are of considerable length, and also an improved device for hoisting and operating drill rods or cables and drilling tools or any well boring tools or appliances, and a device that is simple, strong and durable in construction, inexpensive to manufacture, and one that readily and easily raises and extends or lowers and folds said sections 3, and at the same time one that when said sections 3 are in their extended position may be locked to safely and securely hold them in their extended position, and again one which may be readily, easily and quickly unlocked to permit the sections 3 to lower and fold to facilitate the transportation or storage of the derrick or device to which it is applied, thus providing a very efficient device in practical use.

Having thus described my invention, I claim:—

1. In an apparatus of the class described, a derrick composed of folding sections, in combination with a locking bar and link pivotally mounted thereon, and their free ends pivotally connected together, and means engaging with or engaged by said locking bar or link for holding and locking said folding sections in their extended position.

2. In an apparatus of the class described, a derrick composed of folding sections, in combination with a locking bar in which a notch is formed and a link, both pivotally mounted on pivots supported by said folding sections, and their free ends pivotally connected together, and the notched portion of said locking bar adapted to engage with or to be engaged by the pivot on which said link is mounted, for holding and locking said folding sections in their extended position.

3. In an apparatus of the class described, a derrick composed of folding sections, a locking bar and link pivotally mounted thereon and their free ends pivotally connected together, in combination with a lever and arm pivotally mounted on said folding sections, and connecting bars connecting said lever with said arm and the latter with the

locking bar, to complete the locking operation of said locking bar, and to unlock the latter to permit the folding sections to lower to their folded position.

4. In an apparatus of the class described, track rails composed of two spaced apart plates on the adjacent faces of which longitudinal flanges or shoulders are formed, in combination with a derrick composed of folding sections, the lower front ends of the lower folding sections of which are pivotally secured to and the lower rear ends of which are provided with shoulders adapted to engage with the longitudinal flanges or shoulders on the adjacent faces of said plates of which the track rails are composed, and means for moving said lower rear ends of said lower folding sections longitudinally on said track rails.

5. In an apparatus of the class described, track rails composed of two spaced apart plates provided with longitudinal flanges or shoulders, and a base on which said track rails are supported, in combination with a derrick composed of folding sections, the lower front ends of the lower folding sections of which are pivotally secured to and the lower rear ends of which are provided with shoulders adapted to engage with the longitudinal flanges or shoulders on said plates of which the track rails are composed, pulleys secured to said lower rear ends of said lower folding sections, and a rope the ends of which pass over said pulleys and are secured to said base.

6. In an apparatus of the class described, a base, track rails secured to said base, a derrick composed of folding sections, the lower front ends of the lower folding sections of which are pivotally secured to said track rails, and the lower rear ends of which lower folding sections are adapted to move on said track rails perfectly free, a roller mounted on the lower folding section and a pulley on the upper folding section of said derrick, and means for moving said lower rear ends of said lower folding section longitudinally on said track rails, in combination with a locking bar in which a notch is formed, and a link, both pivotally mounted on pivots supported by said folding sections, and their free ends pivotally connected together, levers and arms mounted on said folding sections, and connecting bars connecting said levers with said arms and the latter with said locking bars.

In testimony whereof, I have signed in the presence of the two undersigned witnesses.

WALTER ANGUS MacKENZIE.

Witnesses:

P. J. EDMUNDS,

I. S. EDMUNDS.