

(No Model.)

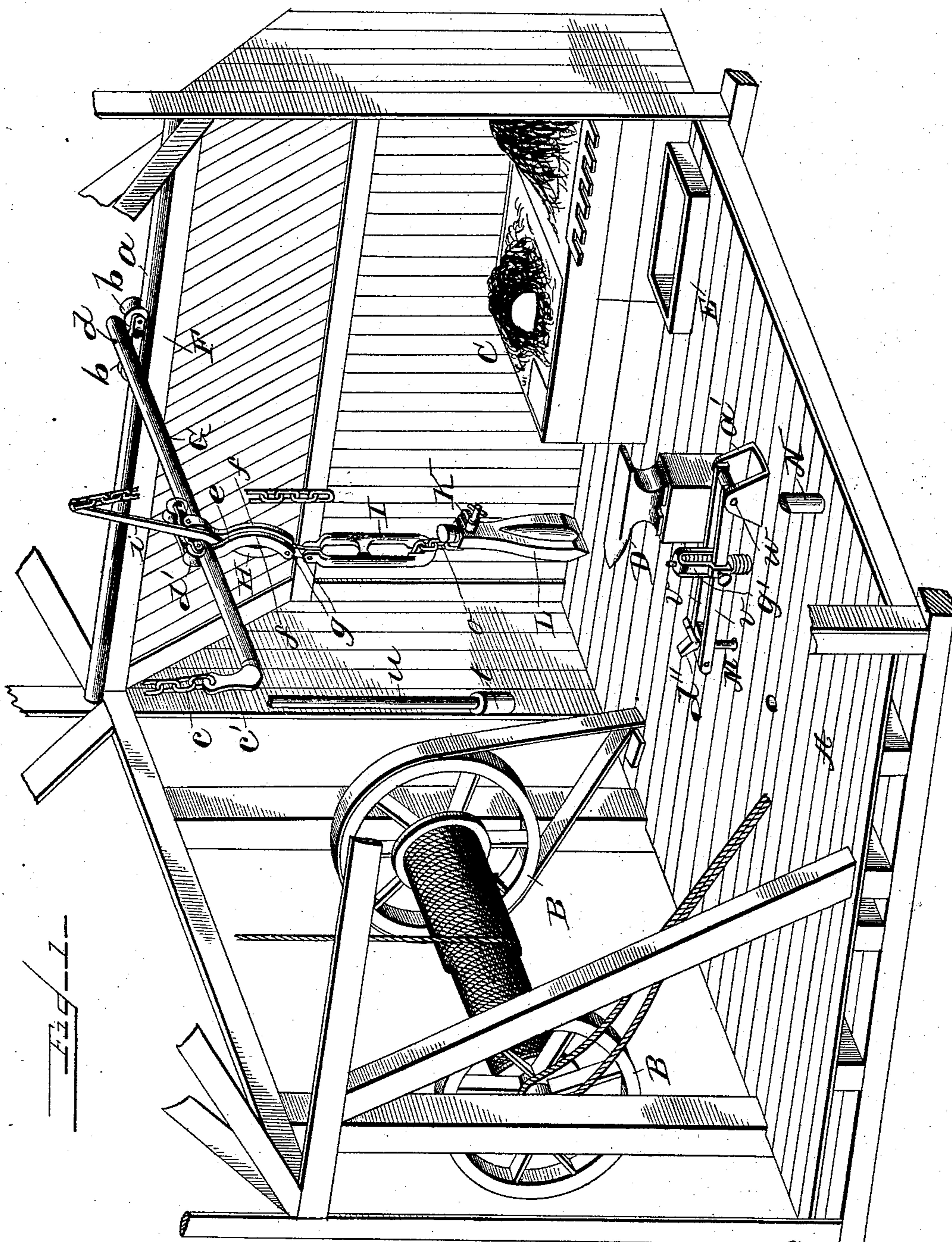
2 Sheets—Sheet 1.

W. FORKER.

MEANS FOR HANDLING DRILL BITS FOR OIL OR ARTESIAN WELLS.

No. 491,164.

Patented Feb. 7, 1893.



Witnesses

*G. A. Fauschmitt*  
*H. B. Reinohl*

Inventor

*Wm. Forker*  
*By D. L. Reinohl*  
Attorney

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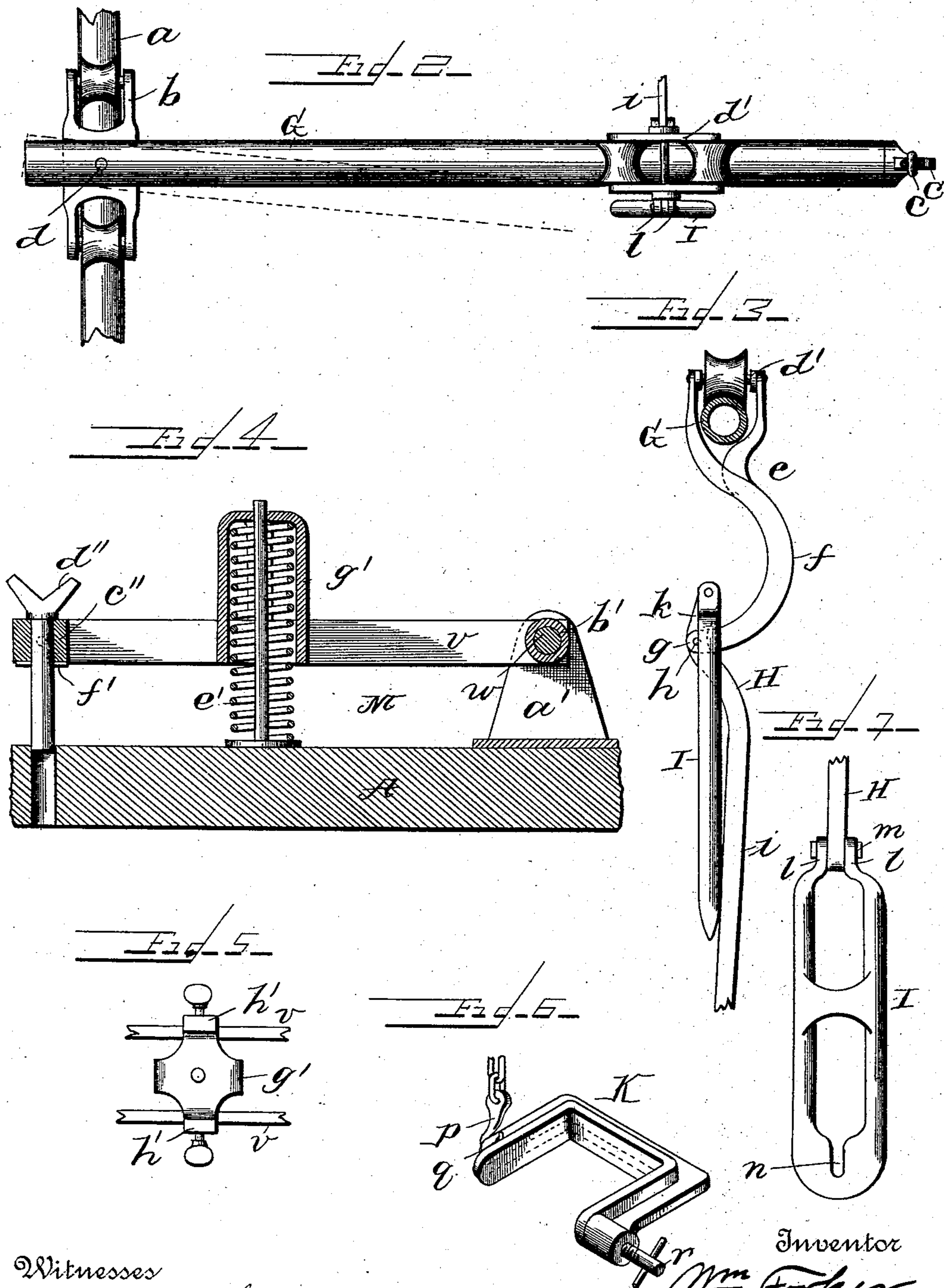
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H. B. Reinold

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Attorney

# UNITED STATES PATENT OFFICE.

WILLIAM FORKER, OF PITTSVILLE, PENNSYLVANIA.

## MEANS FOR HANDLING DRILL-BITS FOR OIL OR ARTESIAN WELLS.

SPECIFICATION forming part of Letters Patent No. 491,164, dated February 7, 1893.

Application filed October 22, 1892. Serial No. 449,567. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM FORKER, a citizen of the United States, residing at Pittsville, in the county of Venango and State of Pennsylvania, have invented certain new and useful Improvements in Means for Handling Drill-Bits for Oil or Artesian Wells; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to oil or Artesian well machinery and has especial reference to means for handling the drill-bit, to remove it from the box of the drill-stem, convey it to the blacksmith's-forge, the anvil and the cooling or tempering bath, and again returning and attaching it to the drill stem; and is preferably attached to the derrick for convenience of manipulation. Under the present practice of drilling oil and Artesian wells the drill-bit weighs from two to nine hundred pounds and has heretofore been handled manually to dress the bit at a great expenditure of time and physical force. It is my purpose to handle the bit mechanically, and thereby save time and the hard labor now attending this part of the work.

The invention will be fully disclosed in the following specification and claims.

In the accompanying drawings which form part of this specification, Figure 1, represents a perspective of part of a derrick for drilling oil or Artesian wells provided with my improvements. Fig. 2, an enlarged top plan view of the jib and part of its track. Fig. 3, an end elevation of the same. Fig. 4, a detailed vertical longitudinal view of the bit supporting device. Fig. 5, a top plan view of the cage for inclosing the spring of said support. Fig. 6, a perspective of the bit-clamp, and Fig. 7, a side view of the link of the bit raising and lowering device.

Reference being had to the drawings and the letters thereon, A indicates the floor of a derrick such as is used in drilling oil or Artesian wells and is provided with the usual appurtenances, such as the bull wheels B, B, a forge C, an anvil D, and a tempering-bath E, all of which may be of any approved construction, and form no part of my invention.

On one of the horizontal "girts" or tim-

bers F, of the derrick is a track *a*, upon which is a trolley *b* to which is pivotally secured a jib G, the outer end of which is attached to and supported by a chain or rope *c* which engages the end of a vertical arm *c'* and is attached to some convenient part of the framing or roof above (not shown) and at a point near the drill-stem when raised and hooked back from over the hole in the floor of the derrick. The long vertical arm *c'* prevents the jib revolving on its axis and breaking its pivotal connection at *d* with the trolley at its rear end.

Upon the jib G is a trolley *d'* to each side of which is pivotally secured one arm of a clevis *e*, each of which arms is bent at *f* to bring the ends *g* approximately under the transverse center of the trolley; and between the lower ends of said arms is fulcrumed at *h* a lever H having a long arm *i* and a short arm *k*, which is used for raising and lowering the drill-bit, as will hereinafter more fully appear.

To the short arm *k* of the lever H is pivotally attached an elongated link I open at its upper end to form lugs *l l* which engage the arm *k* of the lever H by means of a pin *m* passing through said lugs and lever, and of sufficient weight to counterbalance the weight of the lever and keep it normally in a vertical position with the long arm of the lever up, so that it will be out of the way as shown in Fig. 1. In the lower end of the link is a vertical slot *n* to receive a link of a chain *o*, said link being inserted in the slot edgewise, and thus avoids the necessity of using a hook for the purpose of securing the chain to the link. The lower end of the chain *o* is connected to a clamp K by a hoop *p* which engages an eye *q* in said clamp. See Fig. 6. The clamp is provided with a set screw *r* to secure the clamp to the drill-bit L.

To raise the drill-bit L, the long arm *i* of the lever H is drawn down, which causes the short arm *k* to rise and when it has reached its highest position the end thereof to which the lugs of the link I are attached will have passed beyond or inside of the fulcrum pin *h* of the lever and securely lock the lever in this position as shown in Fig. 3. When it is desired to lower the bit it is necessary only to move the long arm *i* of the lever sufficiently to cause

the end of the short arm to pass the fulcrum pin *h*, when the weight of the link *I* will throw the long arm *i* up and out of the way of the operatives.

5 *M* indicates a support for the drill-bit while it is being connected with or disengaged from the box *t* of the drill-stem *u*. This support consists of two parallel bars *v, v* connected at the rear end by a bolt *w* to a pedestal *a'*, and  
10 are kept separated by a thimble *b'* upon said bolt. The front ends of the bars are connected by a yoke or cross-head *c''* which is swiveled in said bars on trunnions which engage the bars to accommodate any changes  
15 from the perpendicular that the rest *d''* may assume by reason of the weight of the drill-bit compressing the spring *e'*. The rest *d''* is axially revolubly supported in the yoke or cross-head *c''* and is secured against being displaced therefrom by a cotter-pin *f'* which  
20 passes through the rest on the under side of the yoke, and upon the bars *v v* is supported a cage *g'* by the side arms *h' h'* engaging said bars, and is adjustable thereon from one end  
25 of the bars to the other to change the position of the spring *e'* to accommodate drill-bits of different weight. The weight of the drill-bit is supported upon the spring and held up thereby in engagement with the box *t*, on the  
30 drill-stem *u*, until the screw-threads of the two have become engaged to their full extent, the spring raising the drill-bit as it enters the box. In unscrewing the bit from the box the weight of the bit is also supported upon the  
35 spring, and when the screw threads have become disengaged, the operator with his foot presses upon the bars *v v* and further compresses the spring until the upper end of the drill-bit leaves the box. After the drill-bit  
40 has been disengaged from the box on the drill-stem the long arm *i* of the lever *H* is drawn down, the drill-bit raised from the floor of the derrick and moved upon the jib *G* to the forge *C*, in which operation the trolley *d'* moves  
45 upon the jib and the trolley *b* upon the track *a*, while at the same time the jib *G* moves laterally independently of the trolley *b* upon its pivotal connection at *d* with the trolley. After the drill-bit has been sufficiently heated  
50 it is moved upon the jib *G* to the anvil *D*, where it is dressed by a blacksmith or "tool dresser," and then moved to the bath *E* where it is properly tempered. During these several operations the trolleys move upon the jib  
55 *G* and track *a* to accommodate the several positions of the drill-bit *L*.

The pedestal *a'* is secured to the floor *A* of the derrick near one side of the "headache post" *N*, and when not in use the support may  
60 be thrown up out of the way and usually leans back beyond the "headache post," this movement being provided by the bars *v v* swinging upon the bolt *w*. While the jib is being moved it is prevented from turning axially  
65 by the upturned arm *c'*, and the chain *c* yields sufficiently to allow the jib to move laterally on the track *a*.

The jib *G* and the track *a* are preferably cylindrical in cross section to admit of lateral swinging of the drill-bit in handling, but an  
70 angular structure may be used for the purpose.

Having thus fully described my invention, what I claim is:—

1. Means for handling drill-bits, comprising 75 a movable jib, a trolley movable on said jib, a clevis pivotally connected to said trolley and a lever fulcrumed in said clevis, in combination with means for connecting said lever to a drill-bit. 80

2. Means for handling drill-bits, comprising a jib, a trolley to which the jib is pivotally connected, and a track supporting said trolley, in combination with a trolley supported on said jib, a clevis connected to the latter  
85 trolley, a lever connected to the clevis, and means for connecting the lever to a drill.

3. Means for handling drill-bits, comprising a movable jib, a trolley movable on said jib, a two part clevis pivotally connected to the  
90 trolley at its upper end and having its arms bent to bring the lower ends of the arms in a line approximating the transverse center of the trolley, and a lever pivoted in the clevis, in combination with means for connecting said  
95 lever to a drill-bit.

4. Means for handling drill-bits, comprising a clevis a lever eccentrically pivoted in said clevis and an elongated counter-balancing link attached to the short arm of the lever, in  
100 combination with a clamp to engage a drill-bit, and intermediate connections between said link and bit.

5. Means for handling drill-bits, comprising a clevis, a lever fulcrumed in said clevis, a  
105 counter-balancing link open at one end and connected to said lever, in combination with a clamp to engage a drill-bit, and means for connecting the link to the clamp.

6. Means for handling drill-bits, comprising 110 a revoluble rest to receive the end of a drill-bit and a resilient support to sustain the weight of the bit while being engaged with the box of a drill-stem.

7. Means for handling drill-bits, comprising 115 a pair of parallel bars, a spring, and a revoluble rest for the bit, supported on said bars.

8. Means for handling drill-bits, comprising a pair of parallel bars pivotally connected to a pedestal at one end, a cage provided with  
120 a spring adjustable on said bars, and a revoluble rest also supported by said bars.

9. Means for handling drill-bits, comprising a movable jib, means for raising, conveying and lowering a drill-bit, and a clamp for en-  
125 gaging said bit, in combination with a resilient support and a revoluble rest.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM FORKER.

Witnesses:

D. C. REINOHL,  
H. B. REINOHL.