

(No Model.)

3 Sheets—Sheet 1.

T. C. SIME.
DRILLING MACHINE.

No. 498,313.

Patented May 30, 1893.

Fig. 1.

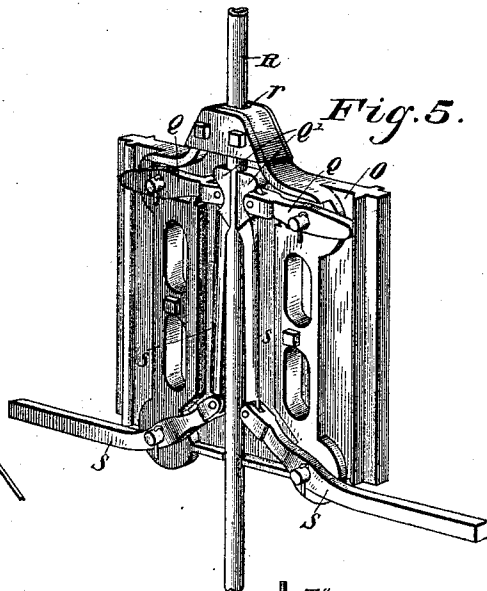
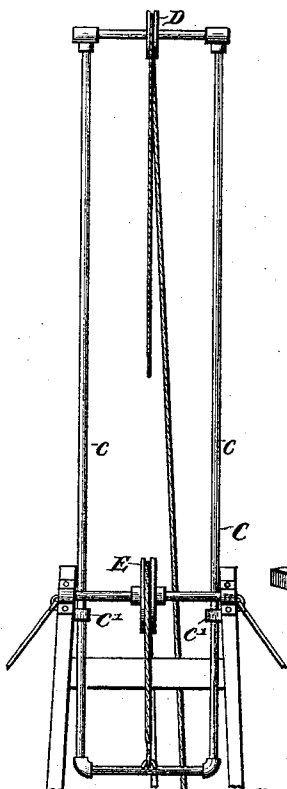


Fig. 5.

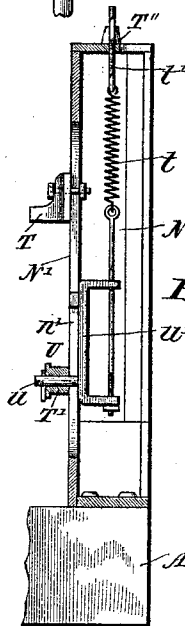


Fig. 7.

Witnesses;

M. Withers
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By his Attorneys,

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Inventor,

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(No Model.)

3 Sheets—Sheet 2.

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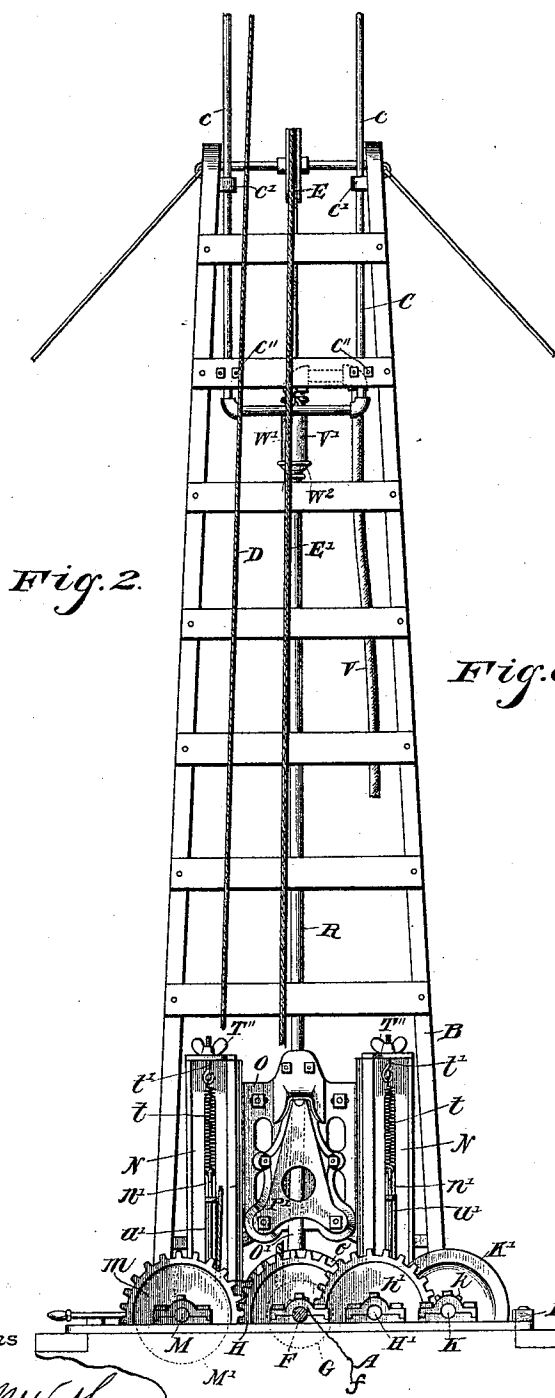


Fig. 2.

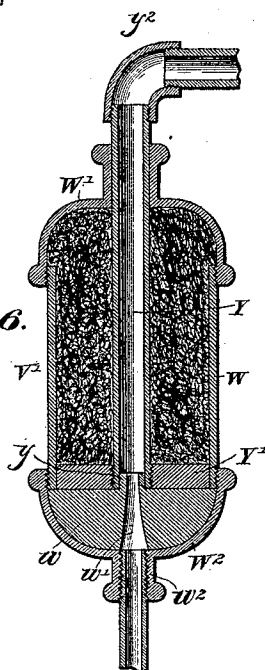


Fig. 6.

Witnesses

J. M. Thurmond.
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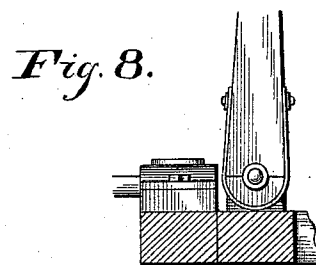
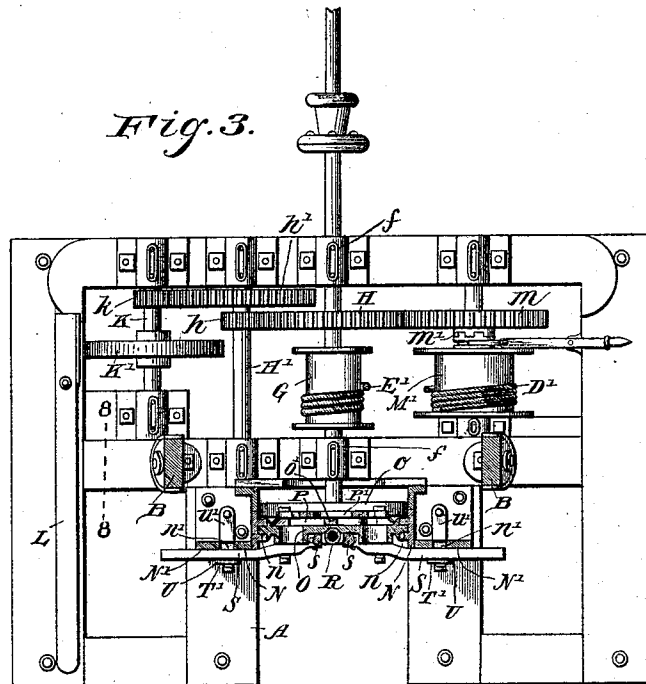
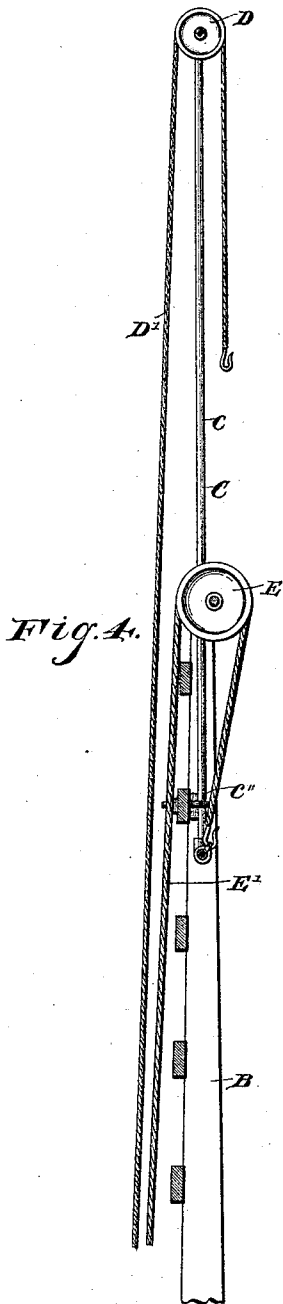
(No Model.)

3 Sheets—Sheet 3.

T. C. SIME.
DRILLING MACHINE.

No. 498,313.

Patented May 30, 1893.



Witnesses;

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E. E. Coyle

Inventor,

Thos. C. Sime,

By *his* Attorneys,

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UNITED STATES PATENT OFFICE.

THOMAS C. SIME, OF HUBBARD, IOWA.

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 498,813, dated May 30, 1893.

Application filed September 29, 1892. Serial No. 447,310. (No model.)

To all whom it may concern:

Be it known that I, THOMAS C. SIME, a citizen of the United States, residing at Hubbard, in the county of Hardin and State of Iowa, have invented a new and useful Drilling-Machine, of which the following is a specification.

My invention relates to improvements in well-drilling machinery; and the objects and advantages of my invention will appear in the following description and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a front view of a drilling machine embodying my improvements, with an intermediate portion of the lower derrick broken away for convenience in illustration. Fig. 2 is a rear view of the same, with the upper portion of the extension derrick broken away. Fig. 3 is a horizontal section on line $-x x-$ of Fig. 1. Fig. 4 is a vertical section of a portion of the derrick to show the means provided for the connection of the lower and upper members thereof. Fig. 5 is a perspective view of the slide carrying the clutch mechanism. Fig. 6 is a detail sectional view of the swivel which is attached to the upper end of the tubular drill-rod for connection with the flexible waste-pipe. Fig. 7 is a detail vertical section through one side of the guide-frame for the slide, to show the stops and means for adjusting the same. Fig. 8 is a detail side view showing hinging of derrick to the base.

A represents the base of the drilling-machine, to which is hinged the lower or main section, B, of the derrick, whereby when the machine is packed for transportation the derrick may be folded. Sliding upon this lower or main portion of the derrick, is an extension, C, whose side-bars, $c c$, fit to slide in keepers, $c' c'$, upon the side-bars of the main section, the extension being locked in its elevated or extended position by clips, c'' . The grooved roll, D, is arranged at the upper end of the extension, and a similar roll, E, is mounted upon a transverse shaft at the upper end of the lower or main section, said rolls being designed to guide the light rope, D', and the heavy rope, E', respectively, the functions of which will appear hereinafter.

Mounted in suitable bearings, f , upon the base, is the main-shaft, F, which is adapted to be operated by steam or other power, as

desired, the same not being shown herein as it forms no part of this invention. The main-shaft carries a drum, G, around which may be coiled one of the above mentioned ropes, and a gear, H, which meshes with a pinion, h , carried by the counter shaft, H'. The counter-shaft furthermore carries a gear, h' , which meshes with a pinion, k , upon the shaft, K, the latter carrying the balance and brake wheel, K'. A pivoted brake, L, is arranged in position to impinge against the periphery of said balance and brake wheel. The gear which is carried by the main-shaft meshes, furthermore, with a gear, m , carried by the drum or bull-wheel shaft, M, upon which is loosely mounted the drum or bull-wheel M'. The drum or bull-wheel may be locked to its shaft by means of a clutch m' , shown clearly in Fig. 3.

N represents a guide-frame, provided with guide-grooves, $n n$, in which fit to slide the lateral edges of the vertical slide-plate, O. The main shaft carries a disk, o , which is connected, eccentrically, by means of a pitman, O', to this slide plate, whereby as the shaft is rotated the plate is vertically reciprocated. The slide-plate is provided with a pocket, P, in which is arranged said pitman, said pocket being closed at the front by the removable plate, P'. Pivotaly mounted upon this slide-plate, near its upper end, are the oppositely-disposed clutch-levers, Q Q, carrying the concave-faced clutch-heads Q' Q', which are adapted to bear against opposite sides of and engage the drill-rod, R, which extends vertically through a socket, r , at the top of the slide-plate. These clutch-heads are connected by means of links, $s s$, to the inner ends of the trip-levers, S S, whose outer arms travel vertically (as the slide-plate moves) in proximity to the front sides of the guide-jambs, N' N'. These guide-jambs are vertically slotted, as shown at n' and vertically adjustable stops, T T', are fitted in said slots. The lower stops, T', are connected to and suspended upon coiled springs, $t t$, which are provided with stems, t' , which extend through suitable perforations in the upper ends of the guide-jambs and are engaged by adjusting nuts, T''. The lower stop consists of a spindle, u , carried by the yoke, u' , upon which spindle is mounted the anti-friction roller, U, whereby the trip-levers in engaging therewith are operated practically without friction. It will

be seen that the engagement of the outer arms of the trip-levers with the lower stops will cause a downward pull upon the clutch-heads which, being carried by the clutch-levers whose inner arms are too long to be depressed to the horizontal plane of their pivot-pins, q , are caused to clutch or grip the drill-rod, and when the trip-levers reach the upper stops, their outer ends are depressed, thereby elevating the clutch-heads and releasing the drill-rod.

From the above description it is evident that as the slide-plate is vertically reciprocated by means of the pitman, the clutch will alternately engage the drill-rod at the lower limit of its stroke, to raise it, and will release the drill-rod at the upper end of its stroke to permit the latter to descend by gravity.

When it is desired to sink a casing, the slide-plate must be removed from its guides, and the casing is driven to place by means of a drive-block, (not shown) of the ordinary or any approved pattern, attached to the rope, E' , which latter is passed around the central or smaller drum which is carried by the main shaft.

To remove the casing, or the tools, when the latter become locked or "stuck," either of the cables may be employed, the cable D' , being preferable from the fact that it has a greater sweep, being passed over a pulley at a greater height, and being carried by a drum of larger diameter.

It will be understood that after the upper portion or extension of the derrick is elevated to its operative position by means of the rope, E' , and is locked in said position, the rope is detached therefrom to be used in the other operations of the machine.

I preferably employ a tubular drill-rod, having at its lower end an eye, q' , which serves as an inlet for water, &c., as the drilling proceeds, which water is thus allowed to escape up the rod. Connected to the upper end of the drill rod is a flexible pipe, V , to carry off the water, and as the drill rod is necessarily turned, continuously, during the process of drilling in order to cause it to descend in a straight line and form a round hole, I employ a swivel coupling, V' , between the upper end of the drill-rod and the flexible-pipe. This swivel-coupling comprises the cylindrical body-portion, W , to the upper and lower ends of which are fitted the screw-caps or reducers, W' and W^2 , respectively. In the lower cap is fitted the disk, w , having a central perforation, w' , which registers with the nipple, w^2 , of the cap, which nipple is screwed upon the upper end of the drill-rod. The disk is loose in the cap. An axial tube, Y , is arranged in the body-portion with its bore aligned with the perforation in the disk, the latter being provided around its perforation with an annular, up-standing lip, y , which projects into the lower end of the axial tube to close the joint therebetween. Screwed upon the lower end of the axial-tube

is a circular bearing plate, Y' , which bears upon the upper surface of the disk and is held from rising by the packing, Y^2 , which is arranged in the body-portion. This axial-tube projects at its upper end through the nipple upon the upper cap and beyond the same to fit into an elbow, y^2 , the other end of which receives the upper end of the flexible pipe.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination of vertical hollow jambs provided in their faces with slots n' and in their adjacent sides with guide-grooves, a slide-plate fitting at its side edges in said guide-grooves, a clutch carried by said plate, clutch-levers connected to said clutch and extending laterally over the faces of the said jambs, upper stops T , lower spring-supported stops T' having yokes u' and adjustable supporting springs arranged in the hollow jambs, a drill-rod, and means to operate the slide-plate, substantially as specified.

2. In a drilling-machine, the combination with the drill-rod, of a vertically reciprocating slide-plate mounted in suitable guides, the clutch carried by said plate, the trip-arms connected to said clutch, the adjustable stops arranged in the paths of the trip-arms, the lower stops being spring-supported and carrying anti-friction rollers, and means to operate said slide-plate, substantially as specified.

3. In a drilling-machine, the combination with the frame-work having a guide-frame, of a drill-rod, a slide-plate fitted to slide in the guide-frame and provided with a pocket P having a detachable covering-plate P' , a main shaft, a disk carried by said shaft, a pitman connecting the disk to the slide-plate and extending into said pocket, the clutch carried by the slide-plate and having trip-arms, stops in the path of the trip-arms, and means to operate the shaft, substantially as specified.

4. In combination with a tubular drill-rod and means for operating the same, of a coupling comprising a tubular body-portion W , cup-shaped caps W' W^2 fitted upon opposite ends of said body portion, a loose disk w fitted in the lower cap W^2 and provided with a central bore w' , an axial tube Y , a disk Y^2 fixed to the lower end of the tube Y and bearing upon the disk w , a flange y surrounding the upper end of the bore in the disk w and fitting within the lower end of the axial tube, and the packing between the axial tube and the walls of the body-portion, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

THOMAS C. SIME.

Witnesses:

C. A. CLANCY,
C. E. UFFORD.