

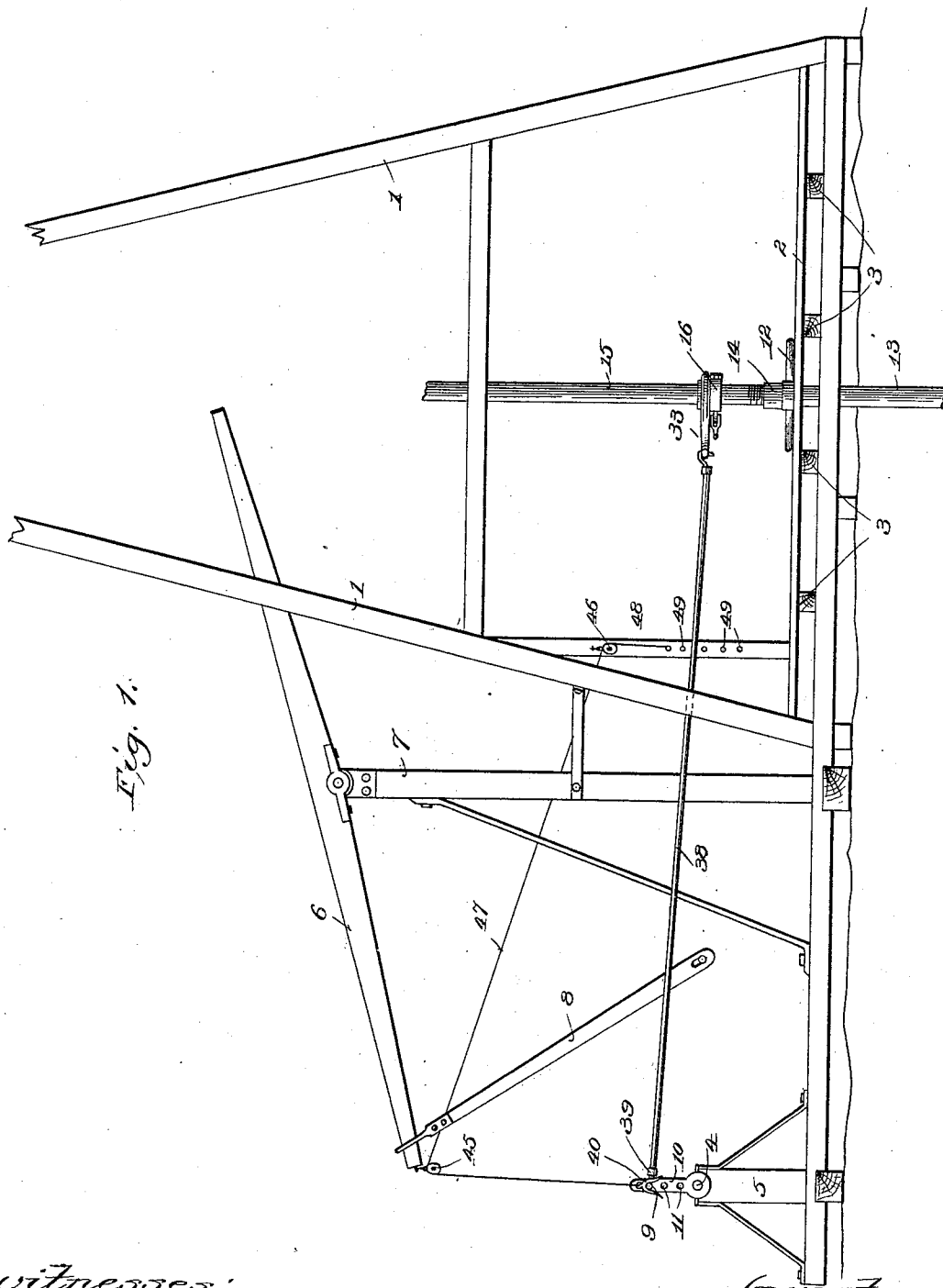
(No Model.)

2 Sheets—Sheet 1.

C. C. STOVER.
OIL WELL-CASING RIG.

No. 519,651.

Patented May 8, 1894.



witnesses:
Harry S. Polner.
John G. Wood.

Inventor:
Cochran C. Stover;
By Knight Bros.
-Htyo

(No Model.)

2 Sheets—Sheet 2.

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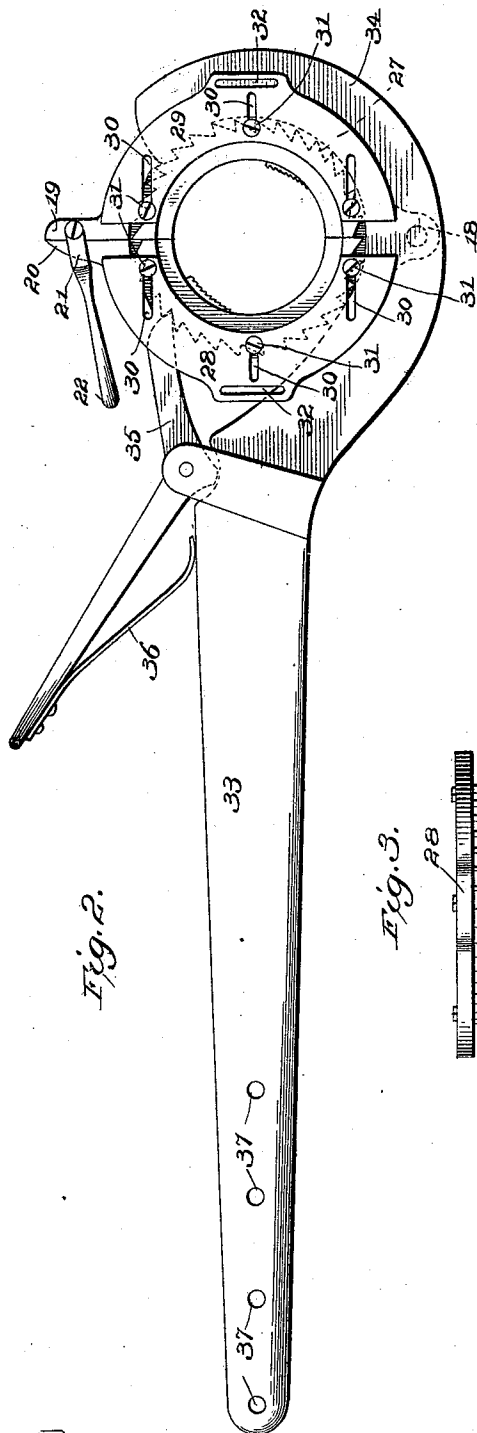


Fig. 2.

Fig. 3.

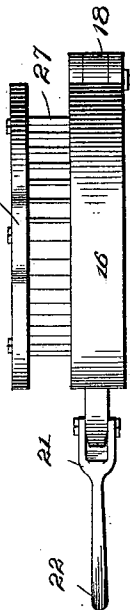


Fig. 4.

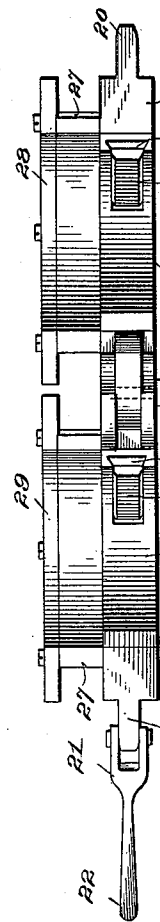
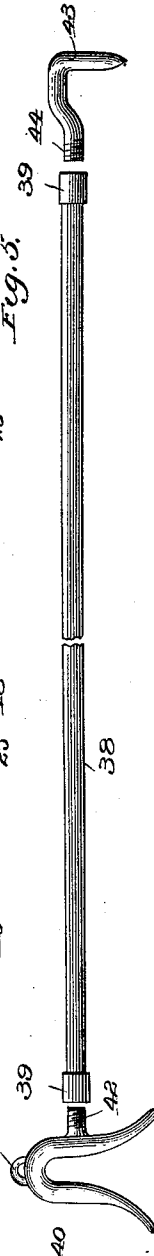


Fig. 5.



Witnesses:
Harry D. Rohrer.
John G. Wood.

Inventor:
Cochran C. Stover.
By Knight Bros.
Atty's.

UNITED STATES PATENT OFFICE.

COCHRAN C. STOVER, OF MCKEE'S ROCKS, PENNSYLVANIA.

OIL-WELL-CASING RIG.

SPECIFICATION forming part of Letters Patent No. 519,651, dated May 8, 1894.

Application filed July 20, 1893. Serial No. 481,025. (No model.)

To all whom it may concern:

Be it known that I, COCHRAN C. STOVER, a citizen of the United States, residing at McKee's Rocks, in the county of Allegheny and State of Pennsylvania, have invented an Improved Oil-Well-Casing Rig, of which the following specification, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to suitable mechanism for effecting the unscrewing and screwing together of the sections of pipe or casing with which a well is cased. In putting in casing, it is the common practice to elevate a section of the casing in the derrick by means of a block and rope which are operated by the bull-wheel, and lower it into the well until its upper end is near the platform of the derrick, in which position it is supported by the clamps or elevators which rest on the platform. Another section is then elevated in the same manner and its lower screw-threaded end placed into engagement with the coupling collar of the lower section, when a rope is wrapped around the upper section so as to form a loop into which the end of a pole is inserted, and several men take hold of the pole and walk around with the upper section of casing until it is tightly screwed into the lower section, the lower section being held against rotation during this operation by suitable tongs. In this manner the whole well is cased, and if for any reason the casing must be pulled out, as for instance, where oil is not found in paying quantities and the well is abandoned, it is necessary to remove each section of the casing in the same laborious manner. It has been proposed to lessen the labor incident to the method commonly employed for inserting and removing the casings, by providing power machines of various forms, but as such machines are more or less expensive and difficult of application, they have not come into general use.

It is the object of my present invention to simplify the process of inserting and removing oil well casings, and to this end my invention consists of a suitable rotary power shaft provided with a crank arm, a wrench which is adapted to be slipped onto and engage a section of casing, and a pitman for transmitting the motion of the rotary power

shaft to the wrench for imparting an intermittent rotary reciprocating motion to the section of casing. Suitable means are also provided for holding and supporting the sections of the casing, while one is rotated with relation to the other for effecting their unscrewing or screwing together.

In order that my invention may be fully understood I will first describe the same with reference to the accompanying drawings and afterward particularly point out the features of novelty in the annexed claims.

In said drawings—Figure 1 is a side elevation of an oil well rig showing my improved mechanism in position for work. Fig. 2 is a detail enlarged view of the ratchet wrench mechanism. Fig. 3 is a side elevation of the sectional clamp. Fig. 4 is an inside view of the same, showing the clamp open. Fig. 5 is a detail view on an enlarged scale of the connecting pitman.

1 represents portions of an oil well derrick formed with the platform 2 which is built upon the cross-beams 3. 4 is the usual bull-wheel shaft journaled in the upper end of the standard 5 which is supported and braced in any usual manner.

6 is the walking beam journaled at the upper end of the upright 7 and provided with a pitman 8 which is adapted to be connected to the crank pin 9 which is mounted on the crank 10. The crank 10 is keyed to the shaft 4 and is formed with a series of openings throughout its length, into any one of which the crank pin 9, may be inserted. By changing the pin from one opening to the other, the length of the stroke of the crank may be adjusted.

12 is any usual form of elevating clamp which is adapted to engage a section of casing and to be attached to the rope which passes over the top pulley of the derrick, and raise the section into position to be lowered into the well.

13 represents a casing section which has been lowered into the well and is supported by the elevating clamp 12 with its upper end projecting slightly above the platform of the derrick. The large screw-threaded collar 14 is in position for reception of the lower screw-threaded end of the next section. 15 is the upper section which is represented in elevated

position with its lower end in readiness to be screwed into the screw-threaded collar 14. For the purpose of screwing this upper section into the lower, I provide a suitable
 5 ratchet wrench mechanism and connect it with the crank 10 for imparting motion to it. This mechanism will now be described. The wrench comprises essentially a sectional
 10 clamp formed with an internal ring of ratchet teeth, and the wrench proper, comprises a rigid jaw and the pivoted spring jaw. 16 and 17 are sections of the clamp, which are pivoted together at 18 and formed with the corresponding noses 19 and 20, to the former of
 15 which, is pivoted a yoke 21 which is adapted to engage the nose 20 and secure the sections together around a section of casing. The yoke 21 is formed with the usual operating handle 22. 23 and 24 are inner ring sections secured to the sections 16 and 17 respectively and formed with dove-tailed tapering grooves 25 in which are removably seated the clamping
 20 dies 26, which are oppositely arranged and are adapted to engage the casing section when the clamp is secured in place, so that it will not slip thereon. The dies may be replaced by new ones when they become worn. 27 is the external ring of ratchet teeth surrounding the sectional clamp and adapted to be engaged by
 25 the wrench proper. 28 and 29 are semi-circular extension flanges formed with slots 30 in which engage the screws 31 that pass into the sectional clamp for securing them to its upper face. These flanges are provided with
 30 openings 32 by which the clamp can be suspended. The manner of securing these sectional flanges or plates, to the clamp enables them to be adjusted to any sized casing. The wrench comprises a handle or
 35 body portion 33 having an integral jaw 34 extending from the head thereof, and the pivoted jaw or pawl 35, which is held in operative position and allowed to slip over the ratchet teeth by the leaf-spring 36. 37 is
 40 the series of openings in the handle 33 of the wrench for the engagement of the hook end of the connecting pitman. 38 is the pitman constructed of a suitable metal bar formed with screw-threaded collars 39 at its opposite
 45 ends. 40 is the double-pointed or U-shaped hook formed with an eye 41 and a screw-threaded shank 42, which is adapted to screw into the collar 39 at one end of the pitman. 43 is a single-pointed hook formed with a
 50 screw-threaded portion 44 which is adapted to screw into the screw-threaded collar 39 at the opposite end of the pitman. The pitman 38 is adapted to communicate motion from the crank 10 to the wrench 33, the double-pointed hook 40 fitting over the crank pin 9 and the single-pointed hook 43 fitting into
 55 one of the openings 37. By changing the hook 43 from one opening to the other, the length of the stroke of the wrench can be regulated. 45 is a pulley block hung from the end of the walking beam 6, and 46 is another pulley block secured to one of the frame

pieces of the derrick. 47 is a cord or rope passing through the said pulley blocks and secured to the eye 41 of the hook 40 and provided at its opposite end with the pin 48
 70 which is adapted to be inserted in one of the openings 49 of the frame piece of the derrick. The purpose of this rope and pulley blocks is to elevate the pitman out of engagement with the crank pin when it is desired to throw the mechanism out of operation. 75

The operation of my improved device will be clear from the foregoing. The pipe sections are elevated and lowered in the usual
 80 manner. When a section has been lowered and the second section raised into place to be screwed into the lower section, the sectional clamp of the ratchet wrench is clamped into position and the wrench placed into engagement therewith. The pitman is then lowered
 85 into place into engagement with the crank pin and wrench handle, so that the rotation of the power shaft 4 will impart a to-and-fro motion to the wrench and screw the upper section into the lower, the spring jaw of the wrench slipping over the ratchet teeth of the clamp during the backward movement of the wrench, and engaging therewith for rotating
 90 the casing section during the forward movement of the wrench. In unscrewing the casing sections it is of course obvious that it will only be necessary to reverse the position of the sectional clamp, so that the wrench will engage the ratchet teeth on its backward
 95 movement and slip over the same on its forward movement. 100

By the above-described mechanism, the labor and expense of inserting and removing casings in oil or other deep wells, are greatly
 105 reduced.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The combination of a suitable wrench
 110 adapted to engage a casing section, a power shaft, a crank-arm keyed to said power shaft, and a pitman connected to said crank-arm and wrench for communicating motion from the former to the latter and effecting the
 115 unscrewing or screwing together of the casing sections, substantially as set forth.

2. The combination of suitable means for rigidly holding and supporting a casing section, with a ratchet wrench adapted to engage a casing section, a power shaft, a crank arm keyed to said power shaft, and a pitman connected to said crank-arm and wrench for communicating motion from the former to the latter and effecting the unscrewing or screwing together of the casing sections, substantially as set forth. 120
 125

3. The combination of suitable means for rigidly holding and supporting a casing section, a sectional clamp adapted to be clamped to a casing section and formed with exterior ratchet teeth, a wrench provided with a suitable spring pawl or jaw adapted to encircle said sectional clamp and engage the ratchet
 130

teeth, a powershaft, a crank-arm keyed to said power shaft, and a pitman connected to said crank-arm and wrench for communicating a reciprocating motion to the latter from the rotary motion of the former and effecting the unscrewing or screwing together of the casing sections, substantially as set forth.

4. The combination of a suitable wrench adapted to engage a casing section, a power shaft, a crank-arm keyed to said powershaft, a pitman connected to said crank-arm and wrench for communicating motion from the former to the latter and effecting the unscrewing or screwing together of the casing sections and suitable means for varying the length of the strokes imparted to the wrench, substantially as set forth.

5. The combination of a suitable wrench adapted to engage a casing section, a series of perforations in the handle of the wrench, a power shaft, a crank-arm keyed to the power shaft, and a pitman attached at one end to the crank-arm and provided at the other end with a suitable hook which is adapted to engage the perforations in the wrench handle, substantially as and for the purpose herein set forth.

6. The combination of a suitable wrench adapted to engage a casing section, a power shaft, a crank-arm keyed to said power shaft and formed with a series of openings through-

out its length, a crank pin adapted to be removably applied to any one of said openings, and a pitman engaging said crank pin at one end and the wrench at the other end, substantially as and for the purpose set forth.

7. The combination of a suitable wrench adapted to engage a casing section, a power shaft, a crank-arm keyed to said power shaft and provided with a crank pin, and a pitman adapted to engage said crank pin and wrench at its opposite ends for transmitting motion from the former to the latter; said pitman consisting of a suitable rod or bar, having a single pointed hook at one end for engagement with the wrench, and a double-pointed or U-shaped hook at the other end for engagement with the crank pin, substantially as and for the purpose set forth.

8. The combination of a suitable wrench adapted to engage a casing section, a power shaft, a crank and crank pin, a pitman adapted to engage said crank pin and wrench, a series of pulleys journaled above the pitman, and a cord passing over said pulleys and attached to the pitman for raising it out of engagement with the crank pin, substantially as set forth.

COCHRAN C. STOVER.

Witnesses:

G. W. BROWN,
ISAAC STOVER.