No. 707,552. Patented Aug. 26, 1902.

T. E. CLARK.

AUTOMATIC STOP AND LOCK FOR OIL WELL CASING PERFORATORS.

(Application filed Aug. 10, 1901.)

(No Model.)

Fig. 1.

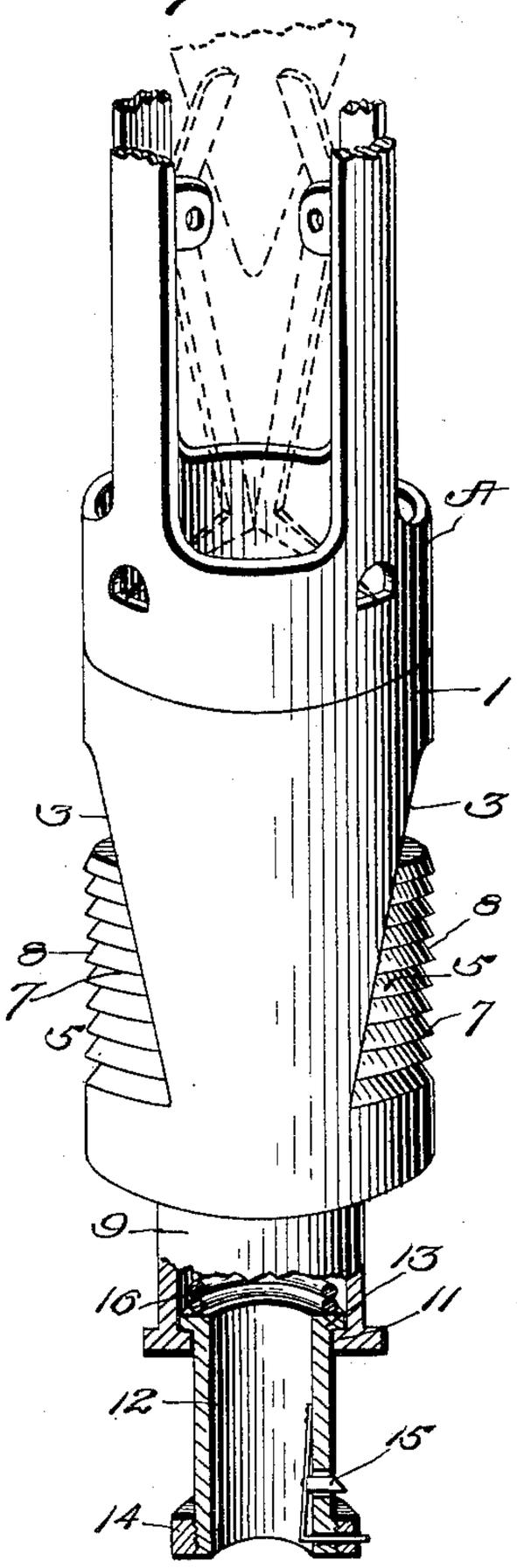


Fig. 2.

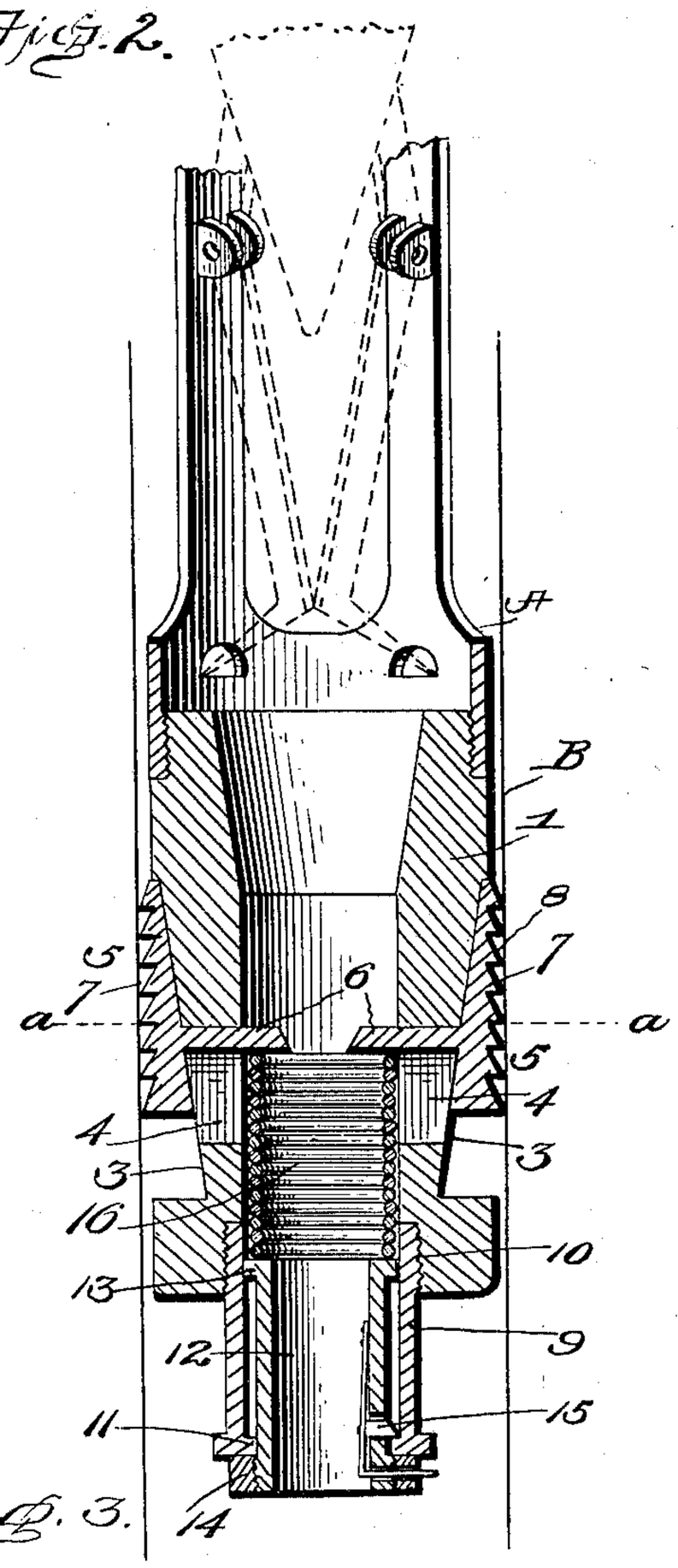
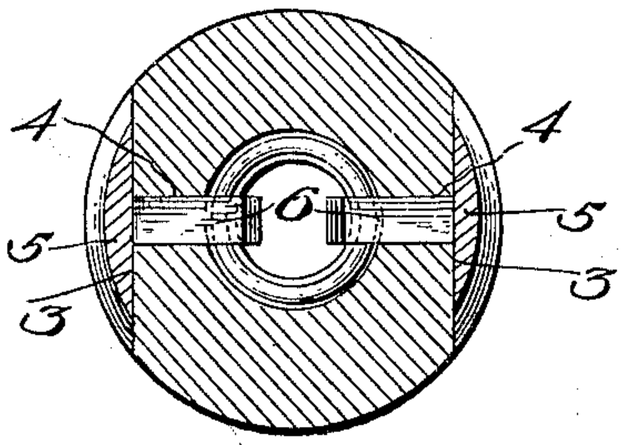


Fig. 3.



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UNITED STATES PATENT OFFICE.

THOMAS E. CLARK, OF VISALIA, CALIFORNIA.

AUTOMATIC STOP AND LOCK FOR OIL-WELL-CASING PERFORATORS.

SPECIFICATION forming part of Letters Patent No. 707,552, dated August 26, 1902.

Application filed August 10, 1901. Serial No. 71,664. (No model.)

To all whom it may concern:

Be it known that I, THOMAS E. CLARK, a citizen of the United States, residing at Visalia, in the county of Tulare and State of California, have invented a new and useful Automatic Stop and Lock for Oil-Well-Casing Perforators, of which the following is a specification.

My invention is an improved automatic stop and lock for oil-well-casing perforators, spears, and the like tools, adapted to arrest the descent of the tool at the bottom of a well and to subsequently lock the tool at higher points in the casing, so that the tool may be operated at various distances from the lower end of the casing; and my invention consists in the peculiar construction and combination of devices hereinafter fully set forth and claimed.

In the drawings, Figure 1 is a perspective view, partly in section, of an automatic stop and lock embodying my improvements, showing the same in connection with an oil-well-casing perforator. Fig. 2 is a vertical sectional view of the same, showing the same locked in the casing of an oil-well. Fig. 3 is a transverse sectional view of the same, taken on a plane indicated by the line *a a* of Fig. 2.

For the purposes of this specification I show my improved automatic stop and lock as connected to an oil-well-casing perforator such as is shown and described in Letters Patent of the United States No. 678,856, granted to A. J. Bellah July 23, 1901; but I would have it understood that my improved automatic stop and lock is adapted for use also in connection with a spear or other tool, such as is employed in the boring of oil-wells and for operating upon the casings thereof, and I do not limit myself in this particular.

In Figs. 1 and 2 of the drawings, A represents the tubular body portion of the well-casing perforator; B, the perforating-bits, which are disposed therein and pivotally connected thereto, as at C, and D the vertically-movable head which operates said perforating-bits in the manner known to those skilled in the art to which my invention relates. In carrying out my invention I provide a tubular body 1, which is attached to the lower end of the body A of said well-casing perforator. As here shown, the said tubular body is connected to the perforator by a screw-coupling 2; but the said tubular body may be formed integrally with or otherwise attached to the said perforator within the scope of my invention, and I do not limit myself in this particular.

The diameter of the tubular body 1 is something less than the interior diameter of the casing B, in which the tool operates, and the said tubular body is provided on opposite sides with downwardly-converging slideways 3. The said body is further provided with vertical slots 4, which extend to the downwardly-tapered sides that form the said slideways. On the said slideways are fitted vertically-movable wedge-clutches 5, which are provided on their inner sides with guide-pins 6, that operate in the slots 4. The said wedge-clutches have their outer sides corrugated, as at 7, the said corrugations having upwardly-converging sides 8. It will be understood that when the said wedge-clutches are lowered, as in Fig. 1, the stop and lock, together with the tool to which it is attached or with which it is formed, may be lowered in an oil-well casing and that when the said wedge-clutches are raised on the said slideways 3, as shown in Fig. 2, they are expanded laterally and engaged frictionally with the casing, thus preventing the tool from descending, but adapting the same to be raised in the casing, the upward pull of the tool causing the wedge-clutches to descend on the slideways.

To the lower end of the body 1 is attached a projecting sleeve 9. The same is here shown as screwed into the lower end of the body, as at 10, and the said sleeve is provided at its lower end with an inwardly-extending annular flange 11. In the said sleeve 9 is telescopically fitted a plunger-sleeve 12, the same being provided at its upper end with an outwardly-projecting stop-flange 13, which is adapted to engage the flange 11 of sleeve 9. On the lower end of the said plunger-sleeve is secured a collar 14, which by coacting with the lower end of the sleeve 9 forms a stop to limit the upward movement of said plunger-sleeve, the flange 11 limiting the lower movement thereof. The said plunger-sleeve is

provided with a spring-pressed locking-detent 15, which is adapted when said plunger-sleeve is moved upwardly in the sleeve 9 and in the bore of the body 1 to engage the flange 11 of said sleeve 9, and thereby lock said plunger-sleeve in its elevated position, as shown in Fig. 2. A spring 16, which is here shown as a coiled extensile spring, is located in the lower portion of the bore of the body 1. The lower end of said spring bears on the upper end of said plunger-sleeve, and the upper end of said spring bears under the guide-pins 6 of the wedge-clutches.

The perforator is lowered in the well, and when the plunger-sleeve strikes the bottom of the well said plunger-sleeve is forced upwardly in the sleeve 9, thereby compressing the spring 16 and causing the latter to move the wedge-clutches upwardly and outwardly and engage the same with the well-casing. The plunger-sleeve, as before described and as shown in Fig. 2, is locked automatically in its elevated position by the spring-detent 15. The perforator is then raised a suitable distance—say six inches, a foot, or thereabout—the spring 16, the slideways 3, and the wedge-clutches permitting the perforator to be thus raised, but preventing the same from descending, hence locking the perforator in the well-casing at any point where it is desired to perforate the casing. The well-casing may be perforated at any number of points successively, after which the perforator may be readily withdrawn from the casing, as will be understood. Before lowering the perforator in the casing initially the detent 15 must be disengaged from the stop-flange 11 of the sleeve 9 to cause the spring 16 to press the plunger-sleeve downwardly. It will be understood that the said spring 16 not only serves to communicate power from the plunger-sleeve to the wedge-clutches, but also serves as a buffer to arrest the descent of the perforator or other tool when the same reaches the bottom of the well.

Having thus described my invention, I claim—

1. In an oil-well tool of the class described, the combination of a tubular body, vertically-movable locking devices thereon, to engage the casing and lock the tool against descent therein, a sleeve detachably connected to the lower end of the body and having an inwardly-extending flange at its lower end, a vertically-movable plunger in said sleeve, a spring-pressed detent, carried by said plunger, to engage the flange and lock the plunger in an elevated position, and a yielding connection between the plunger and the locking devices, whereby the latter are operated by the plunger, substantially as described.

2. In an oil-well tool of the class described, the combination of a tubular body having downwardly-converging slotted sides forming slideways, wedge-clutches, on said slideways having guide-pins in the slots of the body, a vertically-movable plunger, projecting from the lower end of the body, means to lock the plunger in an elevated position, and a spring, compressed by the upward movement of the plunger and connected to the wedge-clutches, substantially as described.

3. An oil-well tool of the class described having a plunger at its lower end, locking devices to engage the casing and lock the tool against descent therein, a spring, compressed by the upward movement of the plunger and connected to the locking devices to actuate the same, and means to lock the plunger in an elevated position, substantially as described.

4. An oil-well tool of the class described, having a plunger at its lower end, wedge-clutches, a spring connecting said plunger and said wedge-clutches, and a spring-pressed detent to lock said plunger in an elevated position, substantially as described.

5. In an oil-well tool of the class described, the combination of locking devices to engage the casing and lock the tool against descent therein, a vertically-movable plunger, a yielding connection between the plunger and the locking devices, and means to lock said plunger in an elevated position, substantially as described.

6. In an oil-well tool of the class described, the combination of locking devices to engage the casing and lock the tool against descent therein, a vertically-movable plunger, a yielding connection between the plunger and the locking devices, and a spring-pressed detent to lock said plunger in an elevated position, substantially as described.

7. In an oil-well tool of the class described, the combination of locking devices to engage the casing and lock the tool against descent therein, a vertically-movable plunger, a spring, compressed by the ascent of the plunger and connecting the latter to said locking devices, and a spring-pressed detent to lock said plunger in an elevated position, substantially as described.

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

THOMAS E. CLARK.

Witnesses:
W. M. THOMPSON,
J. E. GOOD.