No. 657,205. Patented Sept. 4, 1900.

T. SEEVERS.

DRILL JAR AND COUPLING.

(Application filed Apr. 7, 1900.)

(No Model.) 2 Sheets—Sheet 1.

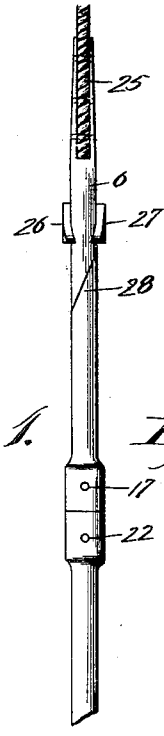


Fig. 1.

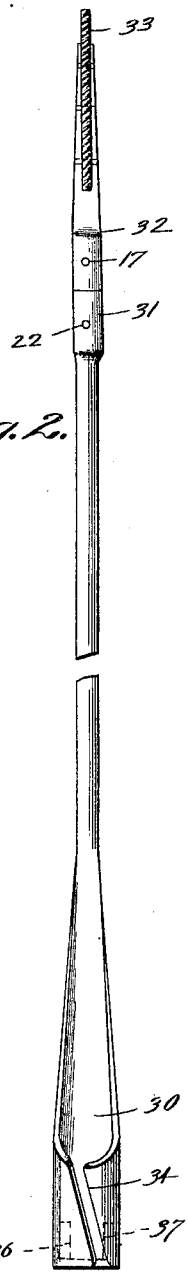
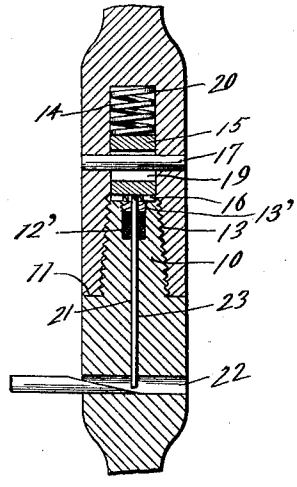


Fig. 2.

Fig. 3.



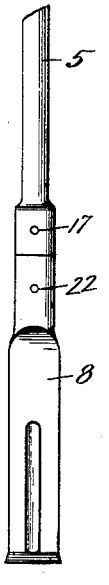
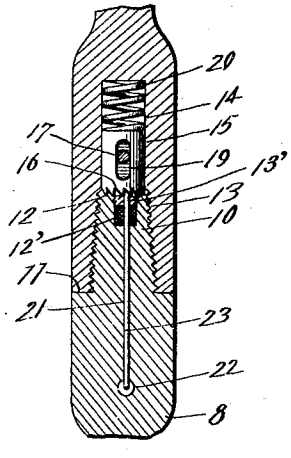


Fig. 4.



Witnesses
C. A. Walker.
Jyo. K. Chandlee.

Thomas Seevers Inventor
By his Attorneys.
C. A. Snow & Co.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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Fig. 5.

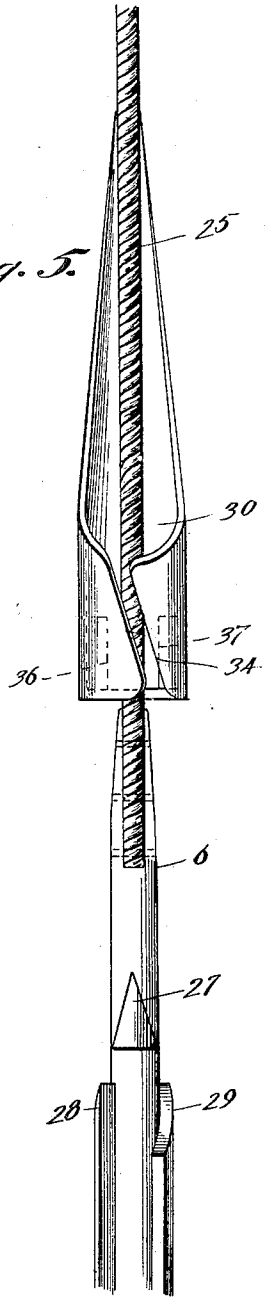


Fig. 6.

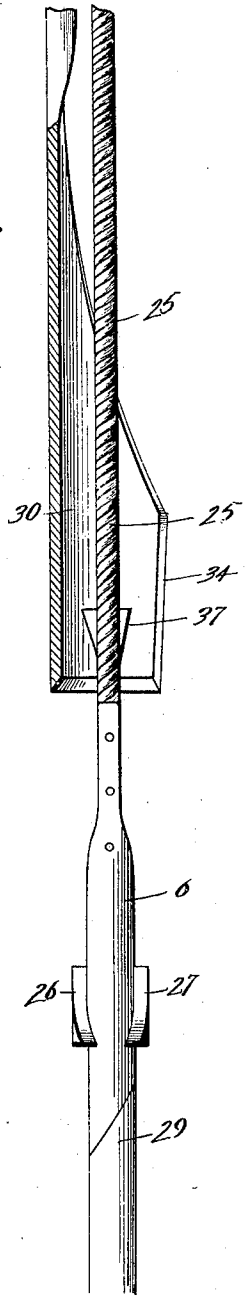


Fig. 7.

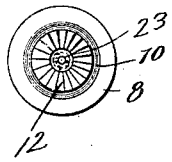
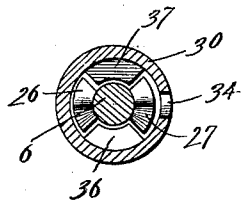


Fig. 8.



Witnesses
C. H. Walker
Geo. H. Chandlee.

Thomas Seevers Inventor
By his Attorneys.
C. A. Snow & Co.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

THOMAS SEEVERS, OF OSKALOOSA, IOWA.

DRILL-JAR AND COUPLING.

SPECIFICATION forming part of Letters Patent No. 657,205, dated September 4, 1900.

Application filed April 7, 1900. Serial No. 12,001. (No model.)

To all whom it may concern:

Be it known that I, THOMAS SEEVERS, a citizen of the United States, residing at Oskaloosa, in the county of Mahaska and State of Iowa, have invented a new and useful Drill-Jar and Coupling, of which the following is a specification.

This invention relates to drills in general, and more particularly to that class employed in the drilling of wells, and it has specific reference to the means for connecting the several sections of the drill-rod and the drill and drill-rod, as also to the jar for loosening the drill when it becomes wedged.

The object of the invention is to provide a construction in which the sections of the rod may be readily connected and disconnected with respect to each other and to the drill and will be held firmly engaged when desired; also, to so construct the rod as to coöperate with a special form of jar, which may be easily applied and removed and will operate efficiently for loosening the drill when it becomes wedged.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a side elevation showing a drill and drill-rod, the latter being partly broken away. Fig. 2 is a side elevation showing the jar. Fig. 3 is a longitudinal section of the joint of the sections of the drill-rod and illustrating the locking-ratchet raised from its operative position to permit disengagement of the joined sections. Fig. 4 is a view similar to Fig. 3 and showing the locking-ratchet in its operative position. Fig. 5 is an elevation showing the upper end of the drill-rod and illustrating the application of the jar thereto. Fig. 6 is a view similar to Fig. 5 and showing the parts rotated through ninety degrees, the jar being in section to illustrate the striking-block on the inner face thereof. Fig. 7 is a top plan view of the upper end of one of the lower sections of the drill-rod and illustrating the ratchet-teeth thereon. Fig. 8 is a transverse section through the drill-rod and the jar and showing the striking-blocks on the jar and the lugs on the rod which they engage.

Referring now to the drawings, and more particularly to Figs. 1, 3, 4, and 5 thereof, it will be seen that the drill-rod is composed of a plurality of sections 5 and 6, the ends of which are similarly formed for mutual engagement.

The upper end of the drill 8 and the upper ends of the rod-sections, with the exception of the uppermost section, are formed slightly greater in diameter than the rod therebelow and are tapered into frusto-conical form, as shown at 10, there being a shoulder 11 at the base of each of these portions 10, while the upper end of each of said frusto-conical portions is serrated to form ratchet-teeth 12.

The lower end of each rod-section is provided with the usual tapered socket 13, having threads for engagement with the threads of the portions 10, which latter threads are formed on the outer faces of the portions 10. The sockets 13, above their lower tapered portions, are formed cylindrical, as shown at 14, and in each of these cylindrical portions is slidably disposed a cylindrical ratchet-block 15, the lower end of which has radial serrations forming ratchet-teeth 16, which are adapted for engagement with the teeth 12 to prevent reverse movement of the portion 10 with respect to the socket to unscrew the sections. This ratchet-block is held from rotation in its socket by means of a pin 17, which is passed through a diametrical slot 19 therein, this slot extending longitudinally of the block to permit movement of the block to engage and disengage its teeth with respect to the teeth 12. In order to hold the teeth 16 in engagement with the teeth 12, a helical spring 20 is placed with one end bearing upon the block 15 and its opposite end bearing against the inner end of the cylindrical portion of the recess, this spring acting to hold the block at the outer limit of its movement yieldably. To disengage the ratchet-block teeth 16 from the teeth 12 when the sections are to be uncoupled, the upper ends or tapered ends of the sections and of the drill-stem are formed with longitudinal recesses 21, which communicate at their lower ends with transverse recesses 22. In each longitudinal recess 21 there is disposed a reciprocatory pin 23, the lower end of which projects into the recess 22, while its upper end lies in a position to engage the ratchet-block 15. When the ratchet-block is to be raised to disengage its teeth from the teeth

12, a wedge-shaped pin is driven into recess 22 to engage pin 23 and raise it. The coupling may be then unscrewed.

The uppermost section of the drill-rod (shown at 6) has the drill-rope 25 attached thereto in the usual manner, and at diametrically-opposite points of this upper section there are formed two triangular lugs 26 and 27, the bases of which are disposed downwardly and at right angles to the axis of the rod, while the sides are curvilinear and reentrant. The bases of these lugs reach substantially through ninety degrees each and are thus separated by interspaces of ninety degrees, and below the interspaces are formed additional lugs 28 and 29, the upper ends of which are slanted in the same direction peripherally of the rod. These lugs are likewise separated by interspaces, as shown in Fig. 5.

The lugs 26, 27, 28, and 29 coöperate with a drill-jar to loosen the drill, and this jar consists of a tubular body 30, one side of which is continued upwardly and is tapered and at the upper end is formed with a coupling member 31, which engages a second member 32, to which the operating-rope is attached. This rope 33 may be the usual sand-rope or may be a special rope, as preferred. In one side of the tubular body 30 is formed a slot 34, disposed at an angle at the axis of the body, this slot being formed as a means for permitting application and removal of the jar to and from the drill-rope, the operating position of the jar being in a position to encircle the drill rope and rod. Upon the inner face of the jar and at diametrically-opposite points thereof are formed two triangular striking-lugs 36 and 37, the bases of which are disposed upwardly and are of a length to permit them to pass between the bases of the lugs 26 and 27. In the application of this jar it is held at an angle to the drill-rope, which latter is engaged through the slot 34, after which the jar is moved to the position shown in Fig. 5. By means of the rope 33 the jar is then lowered into the well until the lugs 36 and 37 pass with their apices between lugs 26 and 27, the latter lugs acting to guide lugs 36 and 37 against the upper slanting ends of lugs 28 and 29, which latter deflect the lugs 36 and 37 and cause them to assume positions beneath lugs 26 and 27, with the bases of lugs 36 and 37 in opposition to the bases of lugs 26 and 27 and below them. By then drawing up sharply the striking-lugs 36 and 37 will strike lugs 26 and 27 and will tend to jar the bit and dislodge it. When it is desired to remove the jar, the rope 33 is twisted in a direction to cause lugs 36 and 37 to move in the direction of the slanting upper ends of lugs 28 and 29, and the rope is at the same time raised, with the result that the lugs 36 and 37 will travel upwardly and along the ends of lugs 28 and 29 and will pass between lugs 26 and 27, after which the jar may be raised from the well. It will thus be seen that the jar may be applied and removed as desired and that when in place it is effective for the purpose designed; also, that with the present form of coupling the parts are securely held together and yet may be readily disconnected at the proper time.

In practice various modifications of the present structure may be made, and in Figs. 3 and 4 it will be seen that the recess 21 is enlarged at its upper end and is provided with screw-threads. In this recess and encircling the rod 23 is a packing 12′, upon which is screwed a gland 13′, which acts to expand the packing radially and force it against the rod to make a water-tight joint. With this construction it will be seen that the rod is held frictionally from dropping out when the parts of the rod are disjointed and that water and therewith sand is prevented from working up and into the joint during the operation of drilling.

What is claimed is—

1. The combination with a drill-rod having spaced lugs and additional lugs below and in line with the interspaces, of a tubular jar having striking-lugs on its inner face, said striking-lugs being adapted to pass between the first-named lugs of the rod and engage the second lugs for movement by the latter to lie beneath the first lugs.

2. The combination with a drill-rod having spaced lugs thereon and guides below the lugs and in line with the interspaces between the lugs, of a tubular jar having lugs on its inner face, said lugs being proportioned and positioned to pass through the interspaces and move along the guides to lie below the lugs on the rod, whereby the lugs on the jar may be raised into engagement with the lugs on the rod.

3. A drill-jar comprising a tubular body portion adapted to receive a drill-rope and having an upwardly-directed stem for attachment of a rope, said body having a rope-entering slot disposed helically thereof, to permit entering of the drill-rope when slack and to prevent its displacement when taut.

4. The combination with a drill-rod having triangular, spaced lugs thereon, of a drill-jar comprising a tubular body adapted for attachment of a rope thereto, said body having a slot formed at an angle to the axis of the body for the insertion of the drill-rope, and inverted, triangular lugs at diametrically-opposite points of the inner face of the body, for engagement with the corresponding lugs upon a drill-rod.

5. A drill-rod comprising sections one of which is provided with a terminal socket the lower portion of which is threaded and the upper portion of which has a spring-pressed clutch member, the second section having a threaded projection for engagement with the socket and a serrated upper end for engagement by the clutch member, a recess in the second section and extending longitudinally thereof, a transverse recess communicating

with the first recess, a reciprocatory rod in the first recess and disposed to lie with its lower end in the second recess, said rod at its opposite end projecting above the second section, and a packing in the longitudinal recess and engaging the rod therein, the second recess being adapted to receive a wedge to engage and force the rod upwardly.

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

THOMAS SEEVERS.

Witnesses:
P. GAD SEEVERS,
A. SUNDERLAND.