No. 789,929. PATENTED MAY 16, 1905.

E. NORTH.

LATCH FOR UNDERREAMERS OR THE LIKE.

APPLICATION FILED FEB. 18, 1902.

Fig. 1

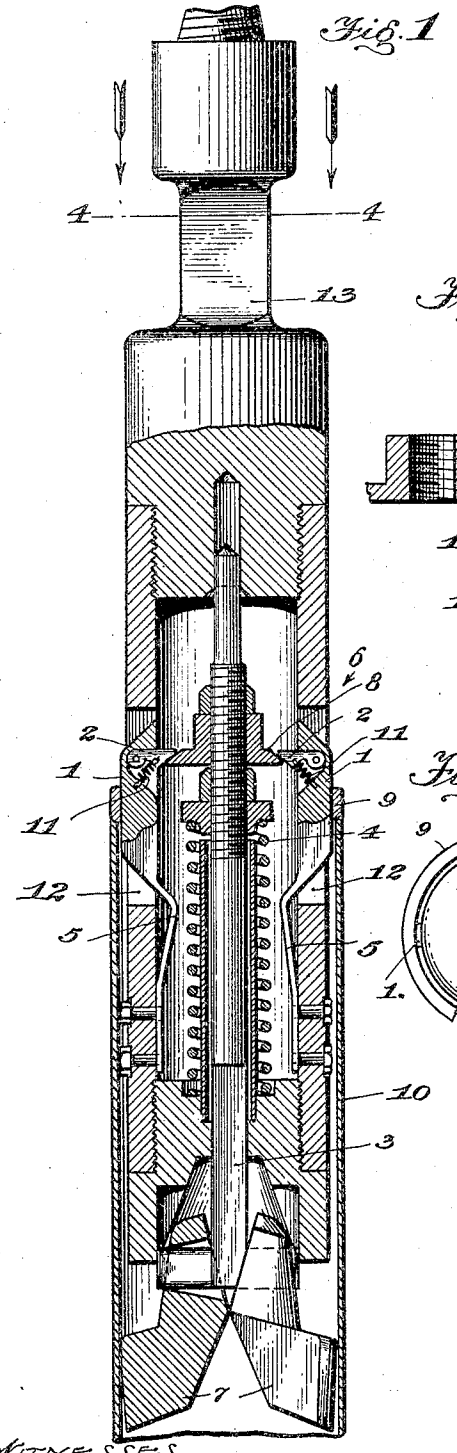


Fig. 3

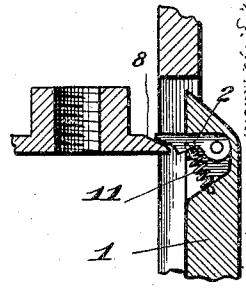


Fig. 4

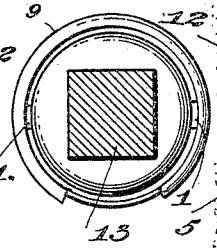
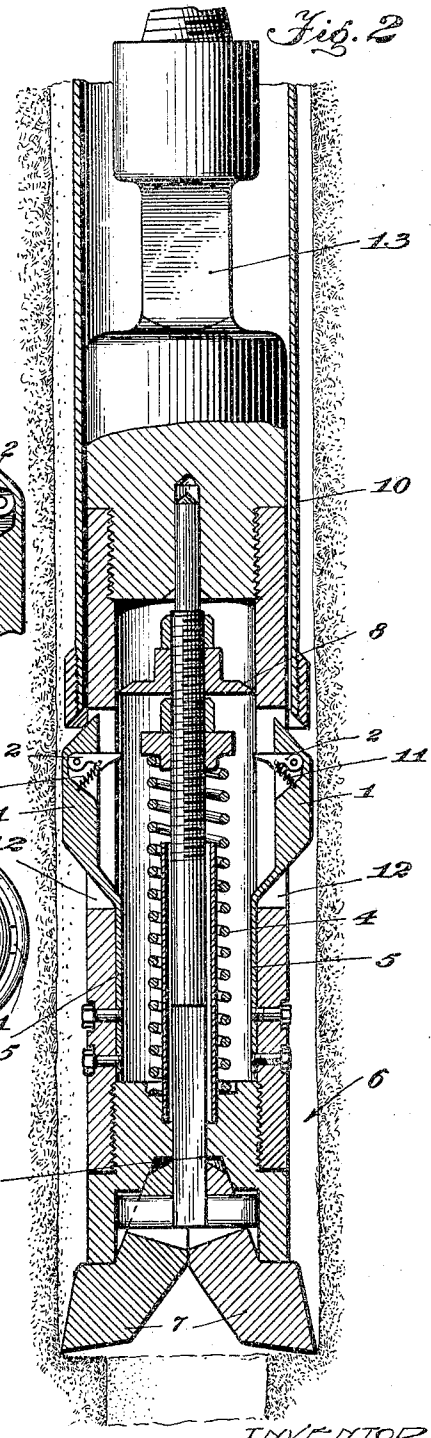


Fig. 2



WITNESSES

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No. 789,929. Patented May 16, 1905.

UNITED STATES PATENT OFFICE.

EDWARD NORTH, OF LOS ANGELES, CALIFORNIA.

LATCH FOR UNDERREAMERS OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 789,929, dated May 16, 1905.

Application filed February 18, 1902. Serial No. 94,664.

To all whom it may concern:

Be it known that I, EDWARD NORTH, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Latch for Underreamers or the Like, of which the following is a specification.

The object of this invention is to provide simple, convenient, and efficient means for holding a spring-operated member of a well-tool against the force of the spring while the tool is being lowered through the well-casing and to provide for the appropriate release of said member after it comes below the casing.

The invention is especially designed for underreamers and expansion-bits; but it may be used for any well-tool in which expansible devices are operated by a spring-actuated member.

The accompanying drawings illustrate this invention.

Figure 1 is a view of an expansion-bit or reamer furnished with my improvement, the parts being in position ready for introducing the tool into the well. Fig. 2 is a like view showing the position of parts after the tool has passed through the casing and come into position for operation as an underreamer. Fig. 3 is an enlarged fragmental detail of one of the catches and a portion of the spring-actuated member which contacts therewith. Fig. 4 is a plan section on line 4 4, Fig. 1, to show how the ring may be removed when the tool has partly entered the casing.

This newly-invented latch comprises a runner 1, a catch 2, carried by the runner, to hold the spring-actuated member 3 against the pressure of the spring 4.

5 designates a spring for normally holding the runner out to release the catch.

6 designates the body of the tool which is furnished with the expansion-bits 7, operated by the spring-actuated member 3.

8 designates a latch-shoulder, preferably consisting of a beveled nut on the spring-actuated member 3 to engage the catch 2.

9 designates a ring constructed to hold the runner against the action of the springs 4 and 5 and constructed to rest upon the top of the well-casing 10, thereby to allow the tool and its runner to escape downward from the ring when the ring comes onto the top of the well-casing, so that the runner is left free to move outward to release the catch when the runner has passed below the bottom of the well-casing.

It is to be understood that one or more runners may be employed within the discretion of the constructor.

Preferably two oppositely-arranged runners will be employed. In the drawings the tool is shown with two runners, each of which is provided with a catch 2.

Preferably an oblique sliding contact portion is provided, as shown, between the catch 2 and the catch-shoulder 8 of the spring-actuated member 3, so that when the runner comes below the casing the force of the spring 4 will operate through the medium of said shoulder to force the runner outward regardless of the action of any other element. Consequently it is to be understood that the runners may be mounted in any way desired without departing from this invention, provided they may move outward when released.

Preferably the catch 2 is a pawl pivoted to allow the shoulder 8 to pass the same in the act of compressing the main spring 4.

11 designates a spring for holding the pawl in position to catch the shoulder.

The upper ends of runners 1 are beveled or inclined, as shown, to enable the ring 9 to be more easily slipped thereon and also to enable the runners to engage and slide within the lower end of the casing 10 in drawing up the tool. The springs 5, which support the runners, are attached to the inside of tubular body 6 and engage with the wall thereof to limit the outward movement of the runners.

In practical use the operator intending to lower the tool into the well will first by any suitable means draw down the bits 7 against the pressure of the spring 4, thus collapsing the bits and allowing the runners 1 to be forced inward in the holes 12, respectively, in the body of the tool provided to receive the same. This brings the catches 2 into position above the shoulder 8 of the spring-actuated member, thus to hold said member down against the action of the spring 4. Then the ring 9, which may be of any suitable form, is brought into

position upon the runners, and the tool is lowered into the well. When the ring 9 strikes upon the top of the well-casing 10, it will rest thereon and the tool will slip down into the well-casing. The ring is preferably open at one side, so that it may be taken off of the tool, at the square portion 13 thereof, as soon as the cylindrical portion of the tool has entered the casing. When the runners pass below the bottom of the well-casing, the spring 4 or springs 5 will throw them out, thus withdrawing the catches from the shoulder and allowing the spring to bring the bits into cutting position. As the tool is withdrawn the runners and the bits are pressed in by the casing-shoe, thus allowing the tool to be readily removed.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination in a well-tool, of a catch; a runner which carries the same; a spring to force the runner outward to release the catch; and a separate and independent removable ring to hold the runner against the action of its spring and constructed to rest upon the top of the well-casing, thereby to allow the tool and its runner to escape from the ring so that the runner is left free to move outward to release the catch when the runner has passed below the bottom of the well-casing.

2. The combination in a well-tool, of a tool-body; a spring-operated member arranged to engage the same; a catch; a runner which carries the catch; a spring to normally hold the runner outward from the spring-operated member to release the catch; and means to temporarily hold the runner inward against the action of the spring.

3. In a well-tool, a latch for holding a spring-operated member against the force of the spring, which latch comprises a runner and a catch pivoted upon said runner and swinging toward said spring-operated member to engage the same and adapted and arranged to hold the spring-operated member; and said spring-operated member adapted and arranged to exert a force to move the runner outward.

4. A well-tool body, a runner, a pivoted latch and a spring-operated member, said runner being directly mounted upon and within and projecting from the tool-body to engage the well-casing and being furnished with said latch to hold said spring-operated member and said latch and said spring-operated member having interengaging oblique sliding contact portions to exert a force to move said runner outward.

5. In a well-tool, a body, a spring-runner, a latch and a spring-operated member; the spring of said runner being carried by said body below the runner and furnished at its upper end with said latch, and said latch being adapted and arranged to extend over a portion of said spring-operated member to hold such member against the pressure of its spring.

6. In a well-tool, in combination, a tool-body, a spring-actuated member arranged therein, a runner yieldingly pivoted within said body and adapted to extend beyond the wall thereof, and a catch pivoted on said runner and adapted when moved inward by said runner to engage said spring-actuated member and lock the same against movement.

7. In a well-tool, a tool-body, a spring-actuated member arranged therein, a runner yieldingly fixed on said body and normally extending beyond the side wall thereof, and a catch pivoted on said runner, and means on said rod to be engaged by said catch when said runner is moved inward.

8. In a well-tool, a tool-body, a spring-actuated member arranged therein, a runner yieldingly fixed on said body and normally extending beyond the side wall thereof, and a catch pivoted on said runner, said catch provided with an inclined bearing-face, and means on said rod to be engaged by said catch when said runner is moved inward, said means provided with a bearing-surface, oppositely inclined to the inclined face of said catch, against which said inclined face of the catch is adapted to bear.

9. In a well-tool, in combination, a body, a spring-operated member, expansion-bits connected thereto, latches for holding said member against the force of the spring, said latches comprising springs attached to the body and runners carried by the springs, means for limiting the outward movement of said runners under the action of said springs, spring-catches pivoted upon said runners and extending inwardly toward the spring-operated member and means on the spring-operated member to engage said catches when the runners are forced in.

10. In a well-tool, in combination, a body, a spring-operated member, expansion-bits connected thereto, latches for holding said member against the force of the spring, said latches comprising springs attached to the body and runners carried by the springs having inclined upper ends, means for limiting the outward movement of said runners under the action of said springs, spring-catches pivoted upon said runners and extending inwardly toward the spring-operated member and means on the spring-operated member to engage said catches when the runners are forced in.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, at Los Angeles, California, this 12th day of February, 1902.

EDWARD NORTH.

Witnesses:
JAMES R. TOWNSEND,
ANNA M. HOLLY.