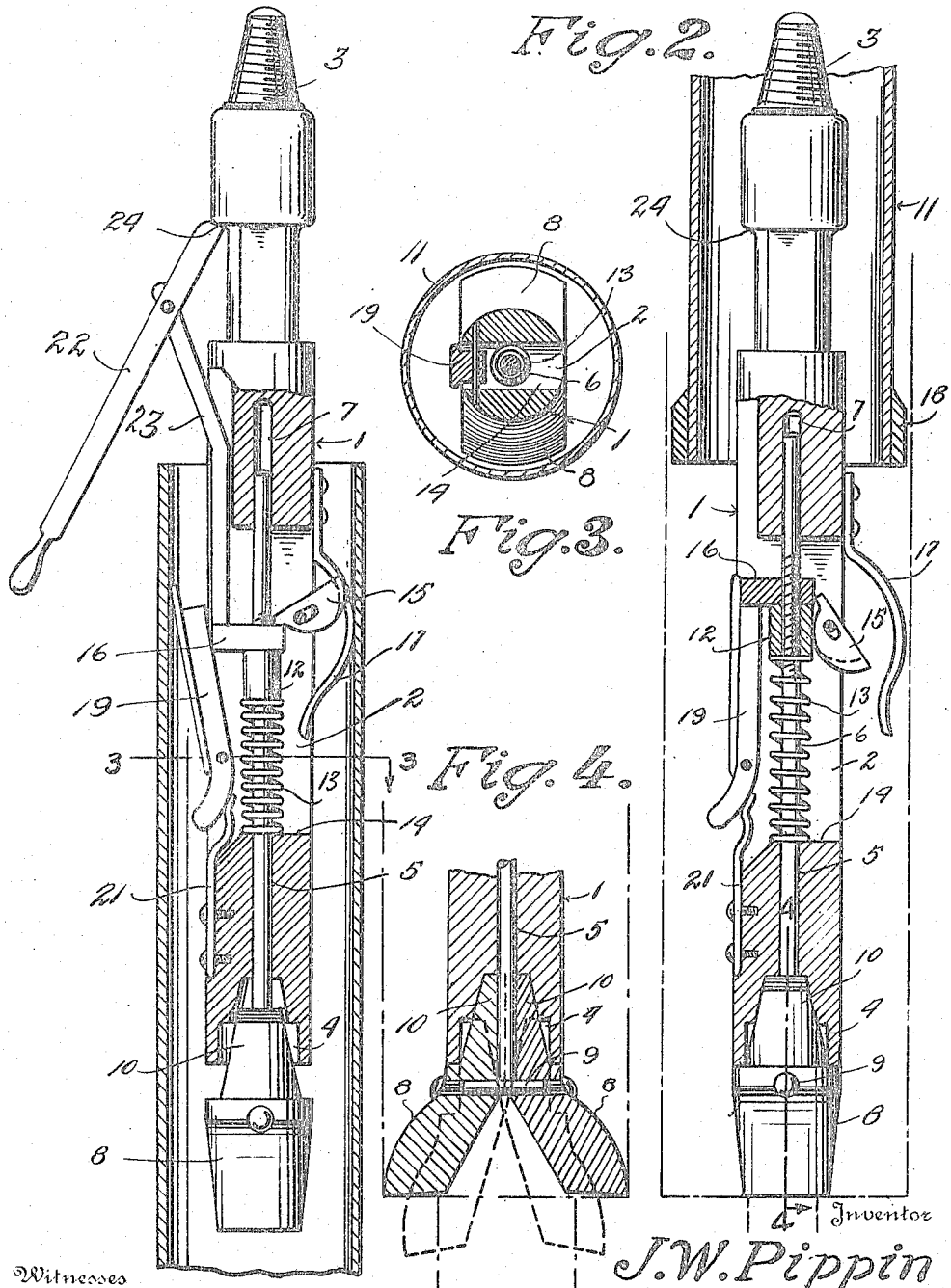
J. W. PIPPIN.

UNDERREAMER.

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1,133,398. Patented Mar. 30, 1915.



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UNITED STATES PATENT OFFICE.

JOHN W. PIPPIN, OF BROWNWOOD, TEXAS.

UNDERREAMER.

1,133,398. Specification of Letters Patent. Patented Mar. 30, 1915.

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To all whom it may concern:

Be it known that I, JOHN W. PIPPIN, a citizen of the United States, residing at Brownwood, in the county of Brown, State of Texas, have invented certain new and useful Improvements in Underreamers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention is directed to improvements in underreamers, and has for its object to so construct a device of this character that the bits may be readily contracted when lowering the device in a well casing and readily expanded for reaming when reaching a point below the lower end of the casing.

A further object of the invention is to provide an underreamer, which is exceedingly simple in construction, durable and efficient in operation, and one which can be manufactured at a minimum cost.

With these and other objects in view, this invention resides in the novel features of construction, formation, combination and arrangement of parts to be hereinafter more fully described, claimed and illustrated in the accompanying drawing, in which:—

Figure 1 is a side elevation of the device, partly in section, showing the bits in the position when being lowered in the casing. Fig. 2 is a similar view showing the positions of the bits after passing from the casing. Fig. 3 is a sectional view on line 3—3 of Fig. 1. Fig. 4 is a similar view on line 4—4 of Fig. 2.

Referring to the drawing, the numeral 1 designates the body, the same being provided with a longitudinal slot 2, the upper end of said body being provided with a tapered extension 3 for engagement by the usual drill rod (not shown). The lower end of the body 1 is provided with a recess 4, the upper end of which communicates with the lower end of the bore 5 and in which operates the rod 6, said rod having its upper end slidably engaged in the socket 7 formed in the upper end of the body 1.

The bits 8 are connected by the bar 9, said bar being fixed to the lower end of the rod 6 so that when the rod is moved upwardly the tapered extensions 10 carried by the bits will cause the same to expand, and upon downwardly movement of said rod the bits will contract so that they may be readily entered in the casing 11.

Threaded upon the rod 6 is a sleeve 12, which is engaged by the upper terminal of the coil spring 13, said spring surrounding the rod 6 and has its lower end resting upon the annular shoulder 14 formed in the bore 5, said sleeve, when desired, serving to regulate the tension of the spring 13.

Pivotally mounted in the slot 2 is a latch 15 which is adapted to have one end engaged with the block 16 which is fixed to the rod 6, and when engaged thus the bits are in their contracted position, and the spring 13 compressed, said latch being held in engagement with the block by the leaf spring 17, which has one end fixed to the body 1, said spring being adapted to slidably engage the casing 11 and to expand after passing the collar 18, thus tripping the latch. Upon tripping the latch in the manner described it is obvious that the spring 13 during its expansion will move the rod 6 upwardly, thus spreading the bits for reaming.

To hold the rod 6 in its uppermost position and the bits contracted, a finger 19 is provided and is pivotally mounted in the slot 2. The lower end of the finger 19 terminates in an outwardly curved extension 20, which projects beyond the side plane of the body 1 when the upper end of the finger is engaged with the block 16. Thus it will be seen that when the upper end of the finger is engaged with the block that the likelihood of the rod moving downwardly, during the upward movement of the tool is eliminated. A leaf spring 21 has one end connected to the body 1 and its free end engaged with the extension 20 of the finger 19.

To compress the spring 13 a lever 22 is provided, said lever having pivotally connected to its inner end an arm 23 which is adapted to engage in the upper end of the slot 2 so that its lower end will engage the block 16, said lever having its inner end engaged under the shoulder 24 of the tool so that downward movement of said lever will force the arm 23 downwardly, and thus the block 16.

In Fig. 1 the parts are shown in the position assumed when the tool is lowered in the casing, and after the same has been lowered to the proper position the body 1 is moved upwardly until the lower end of the finger 19 engages the lower edge of the collar 18, and upon strain being applied to the tool the

finger 19 is tripped, thus permitting the spring 13 to expand, whereupon the bits 8 are contracted and the finger 19 is disengaged from the block 16 so that the device may be removed from the casing.

What is claimed is:—

1. In a tool of the class described, comprising a body, a rod movable vertically in the body, bits pivoted to the lower end thereof, a spring encircling the rod, means for holding the spring compressed and the bits contracted and means for positively holding the rod against vertical displacement when the first mentioned means is inoperative whereby the bits are maintained in operative positions.

2. In a tool of the class described, the combination with a body having a slot formed therein, a rod movable vertically in the body and slot, a spring encircling the rod and located in the slot, a latch pivotally mounted in the slot, a block carried by the rod for engagement by the latch to hold the spring compressed, bits carried by the lower end of the rod, said bits being contracted when the spring is compressed and the rod is in its lowermost position, said latch being operable to disengage the block when the latch passes from the well casing to permit the spring to expand and force the rod upwardly to expand the bits, and means for engaging the block to prevent accidental movement of the rod downwardly.

In testimony whereof, I affix my signature, in the presence of two witnesses.

JOHN W. PIPPIN.

Witnesses:
CHAS. J. HORN,
W. Z. CHAMPION.