

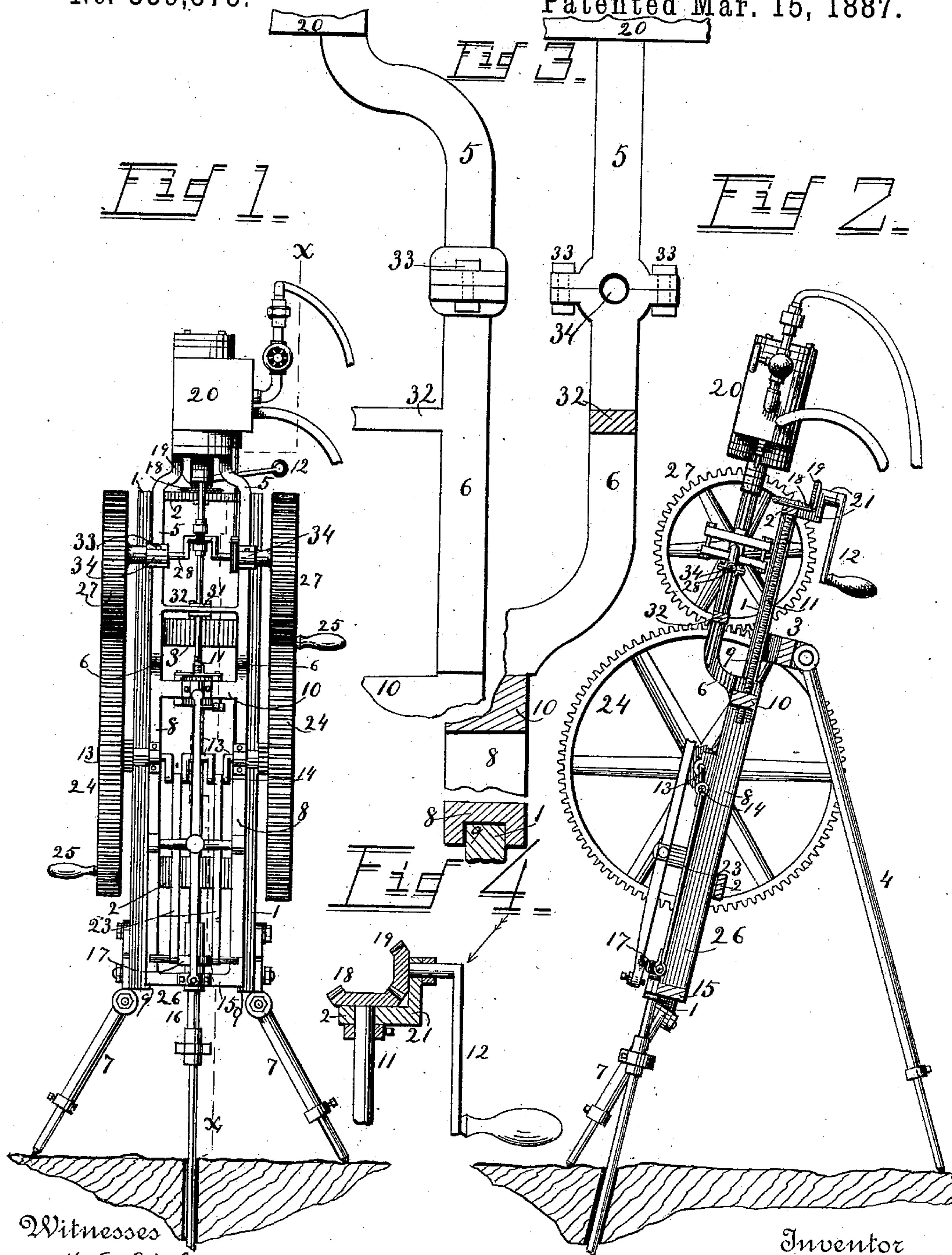
(No Model.)

J. C. STEVENS.

COMBINED HAND AND ENGINE POWER ROCK DRILLING MACHINE.

No. 359,578.

Patented Mar. 15, 1887.



Witnesses

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COMBINED HAND AND ENGINE POWER ROCK-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 359,578, dated March 15, 1887.

Application filed November 18, 1886. Serial No. 219,266. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. STEVENS, a citizen of the United States of America, residing at Portchester, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Combined Hand and Engine Power Rock-Drilling Machines; 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.

This invention relates to that class of rock-drilling machines in which the drill is given a longitudinally-reciprocating motion through the agency of a shaft journaled transversely to the drill-shaft, to revolve in the same frame therewith, such as is shown in the Ingersoll patents, Nos. 344,906 and 344,907.

Heretofore reciprocating engines have been mounted upon tripods to act directly upon the drill to reciprocate it, whereby the force of every blow of the drill upon the rock was produced and resisted directly by the engine, every concussion producing a shock and wear upon the parts, tending to rapidly shake and jar the machine to pieces. Reciprocating engines have also been arranged to propel a hammer to strike upon the head of the drill or its holder; but such devices have been too cumbersome to be mounted upon a tripod, and are not of the nature of this invention, the object of which is, first, to provide means whereby an engine may be mounted on the sliding feed-carriage of a reciprocating drill, out of line of the drill and parallel therewith, in order that the motion of the engine may not tip the tripod over, and in order that the engine may move with the carriage upon the main tripod-frame without contact with the latter; secondly, to provide means whereby the reciprocating motion of the engine may be converted into rotary motion and the same be permanently communicated to a rotary drill-driving shaft, which is journaled in a frame to rise and fall in removing and feeding the drill.

To this end my invention consists in the

construction and combination of parts forming the combined hand and engine power rock-drilling machine hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of a rock-drilling machine with an engine attached according to my invention. Fig. 2 is a vertical section of the same on the line *xx* of Fig. 1, partly in elevation. Fig. 3 is an enlarged detail view of the engine-attaching arm, and Fig. 4 is a detail view of the crank-bracket.

No. 1 represents the sides, and 32 the cross-bars, of the main frame. 3 is another cross-bar of the same frame, to which the rear leg, 4, is hinged, and 7 7 are the two side legs, hinged to the sides of the same frame. The said frame and legs constitute the tripod on which both the engine and the machinery of the drill are mounted.

8 8 are the sides, 10 the upper cross-bar, and 15 the lower cross-bar, of the drill-carriage 26, which is fitted to slide on ways 9, formed on the inner edges of the sides 1 of the tripod-frame.

16 represents a drill shaft journaled to reciprocate longitudinally in bearings in the cross-bars 10 and 15.

13 is a shaft journaled to revolve in the drill-carriage transversely to the drill-shaft, and connected therewith by any desired means—such, for instance, as the cranks 14, straps 23, and the cross-head 17. The characteristics of the particular drill here shown, being the subject of former patents above referred to and therein described, are not herein set forth; but the screw 11, which is journaled in one of the cross-bars 2 of the tripod and threaded in the cross-bar 10 of the drill-carriage to feed the latter, has in this case been provided with improved means for propulsion.

18 is a beveled gear-wheel fixed upon the screw 11, and engaged by another beveled gear, 19, fixed on the shaft of the crank 12, which shaft is journaled in a bracket, 21, attached to the upper cross-bar 2. This change is for the purpose of locating the crank 12 out of the

path of the engine and within more easy reach of an operator standing on the ground.

6 6 are curved arms or brackets, formed as extensions of the sides 8 of the drill-carriage 26 to support the engine 20.

5 5 are arms of the engine-cylinder head fitted to rest upon the brackets 6, and secured thereto by means of bolts 33.

24 represents balance-wheels mounted on the shaft 13, and provided with gear-teeth and with hand-cranks 25.

27 represents gear-wheels fixed on the crank-shaft 28 of the engine. This shaft is journaled to revolve in bearings 34 at the juncture of the arms 5 with the brackets 6, and receives motion through the agency of the yoke 29 on the piston-rod 30 of the engine.

31 is a steady bearing for the piston-rod in a cross-bar, 32, of the arms 5.

20 By means of the cranks 25 the drill may be propelled by hand, and by means of the gear-wheels 24 and 27, and other connections described, the drill may be propelled by the engine. In cases where the drill is more advantageously run for some time by hand, the gear-wheels 27 may be removed to disconnect the engine. The arms 6 are offset from the plane of the drill-carriage 26, to enable the engine to be attached to the drill-carriage out of line of the tripod-frame, so that the engine may pass to and fro with the drill-carriage upon the said tripod-frame and keep the gear-wheels 24 and 27 in engagement. These mounting-arms 6 also permit the engine to be carried parallel with the drill, so that the thrust of the engine does not tend to tip the tripod over. If these arms 6 were dispensed with and the carriage were extended above the tripod-frame far enough to carry the engine above the said frame, the weight of the engine would be too heavy upon the tripod, besides requiring too much room for mining purposes. By the interposition of gear-wheels 24 and 27, of different sizes, between the engine and the drill-shaft, the strokes of the drill bear such an irregular relation to the strokes of the engine that vibration of parts is checked and the shock of the drill blows is removed from the engine.

Some of the advantages of this combined hand and engine power rock-drilling machine are, the facility with which it may be adapted to be run either by hand or steam, or by both, its directness and simplicity of operation, its lightness, compactness, and adaptability to a great variety of situations, and its comparatively low cost.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of the tripod described, comprising a frame mounted on three legs and provided with the slideways 9, a drill-carriage, 26, mounted to slide on the ways 9, and provided with the offset arms 6, a drill-shaft, 16, mounted to reciprocate longitudinally in the carriage, a driving-shaft, 13, journaled in the carriage transversely to the drill-shaft and mechanically connected therewith, gear-wheels 24, mounted on the shaft 13, the engine 20, provided with arms 5, fitted at their ends to engage the said offset arms 6, the crank-shaft 28, connected with the engine and journaled in the arms 5, and the gear-wheels 27 on the shaft 28, adapted to engage the gear-wheels 24, substantially as shown and described.

2. The combination of the tripod, the drill-carriage mounted to slide thereon, as described, and the engine provided with the arms 5, the said carriage being provided with the offset arms 6, fitted to engage the arms 5, substantially as shown and described.

3. The combination, with a rock-drilling-machine carriage, having the offset arms 6, of the engine 20, provided with the arms 5, removably fitted to engage the said arms 6 of the carriage, the said arms 5 and 6 forming a journal-bearing between them, substantially as shown and described.

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

JOHN C. STEVENS.

Witnesses:

JOHN E. MARSHALL,
NATHAN C. POND.