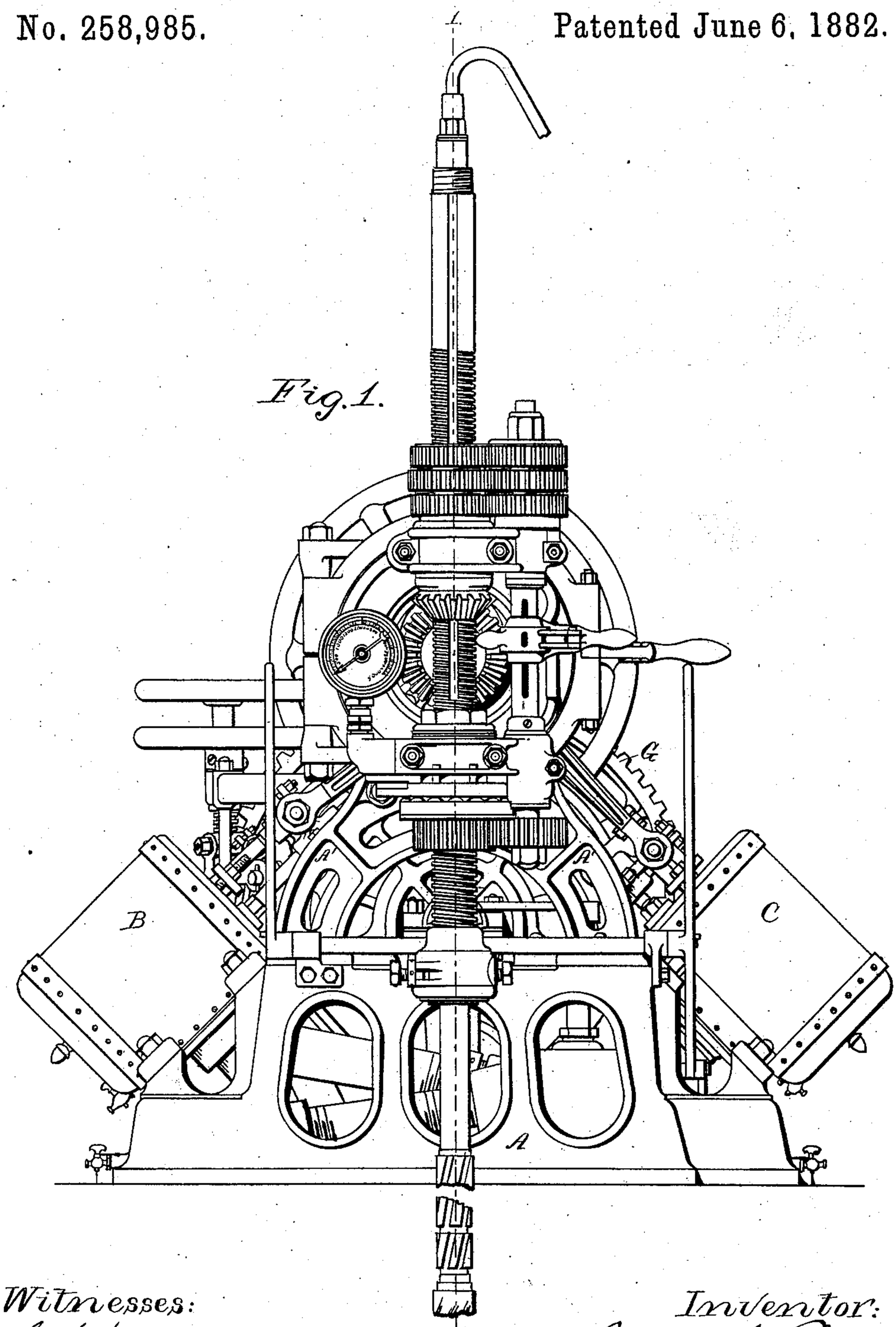
(No Model.) 3 Sheets—Sheet 1.

M. C. BULLOCK.

HOISTING APPARATUS FOR STEAM ROCK DRILLS.

No. 258,985. Patented June 6, 1882.

Fig. 1.



Witnesses:
Chas. S. Hoyer.

Inventor:
Milan C. Bullock
by his attorney
P. C. Dodge

(No Model.) 3 Sheets—Sheet 2.

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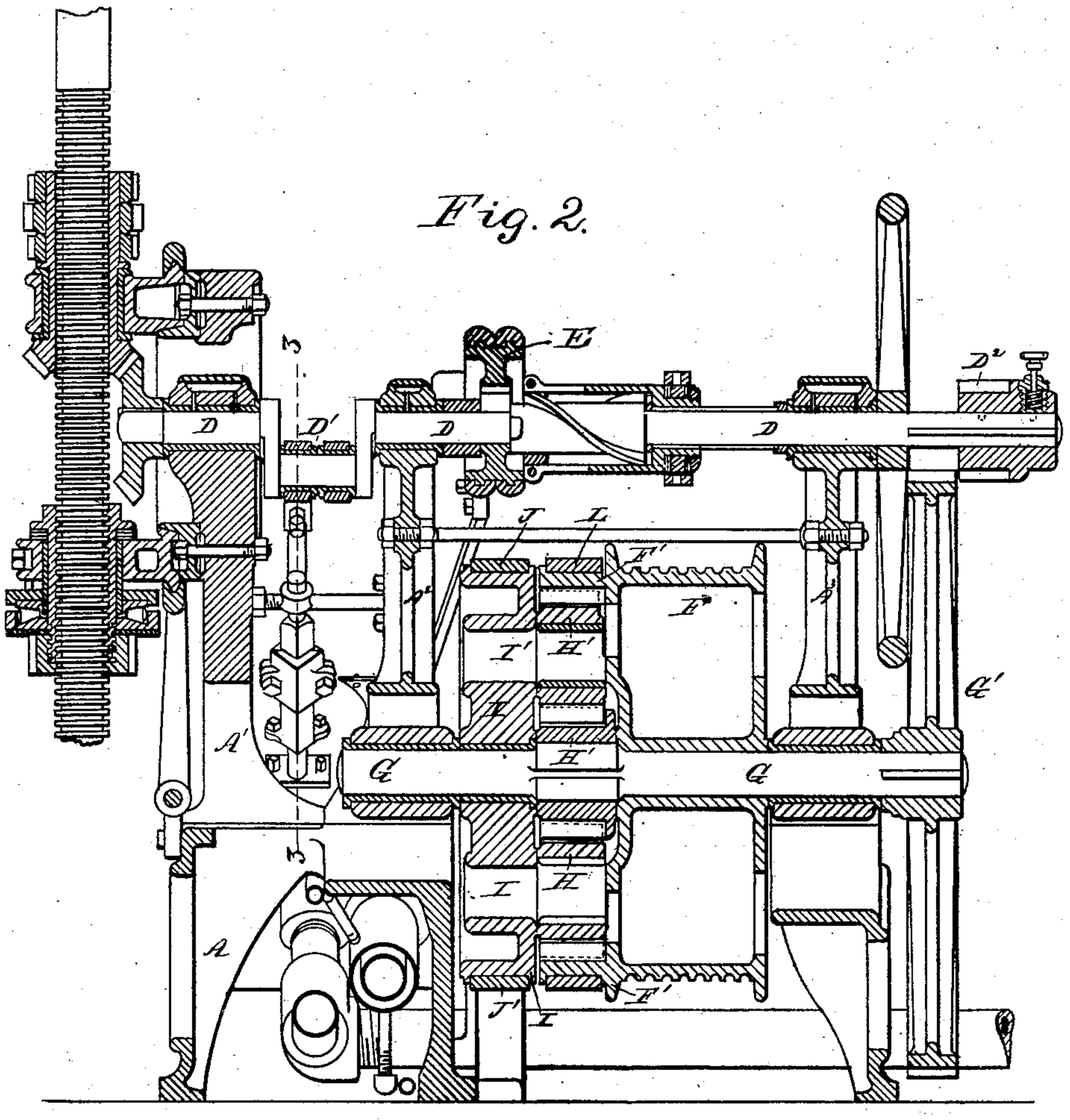
Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

M. C. BULLOCK.

HOISTING APPARATUS FOR STEAM ROCK DRILLS.

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Fig. 5.

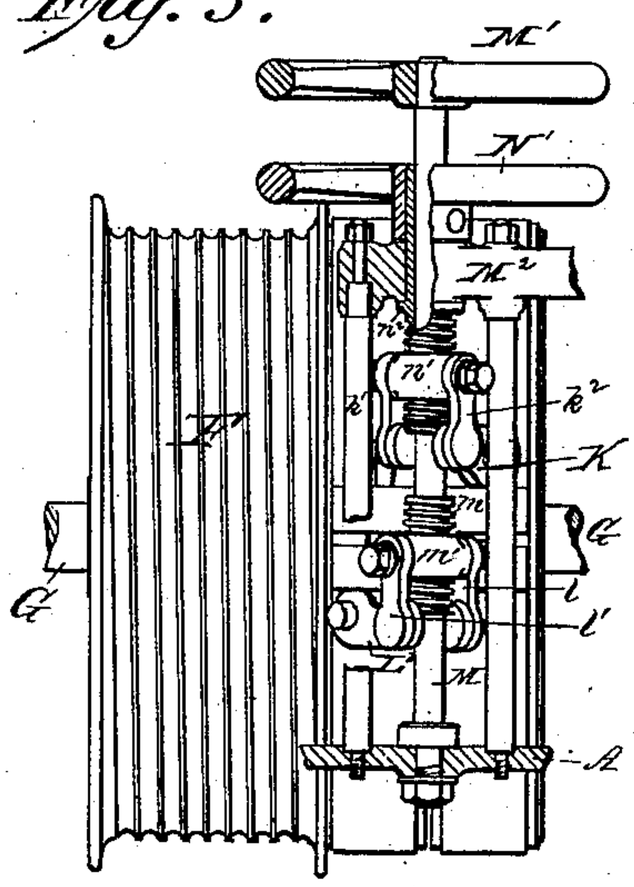


Fig. 3.

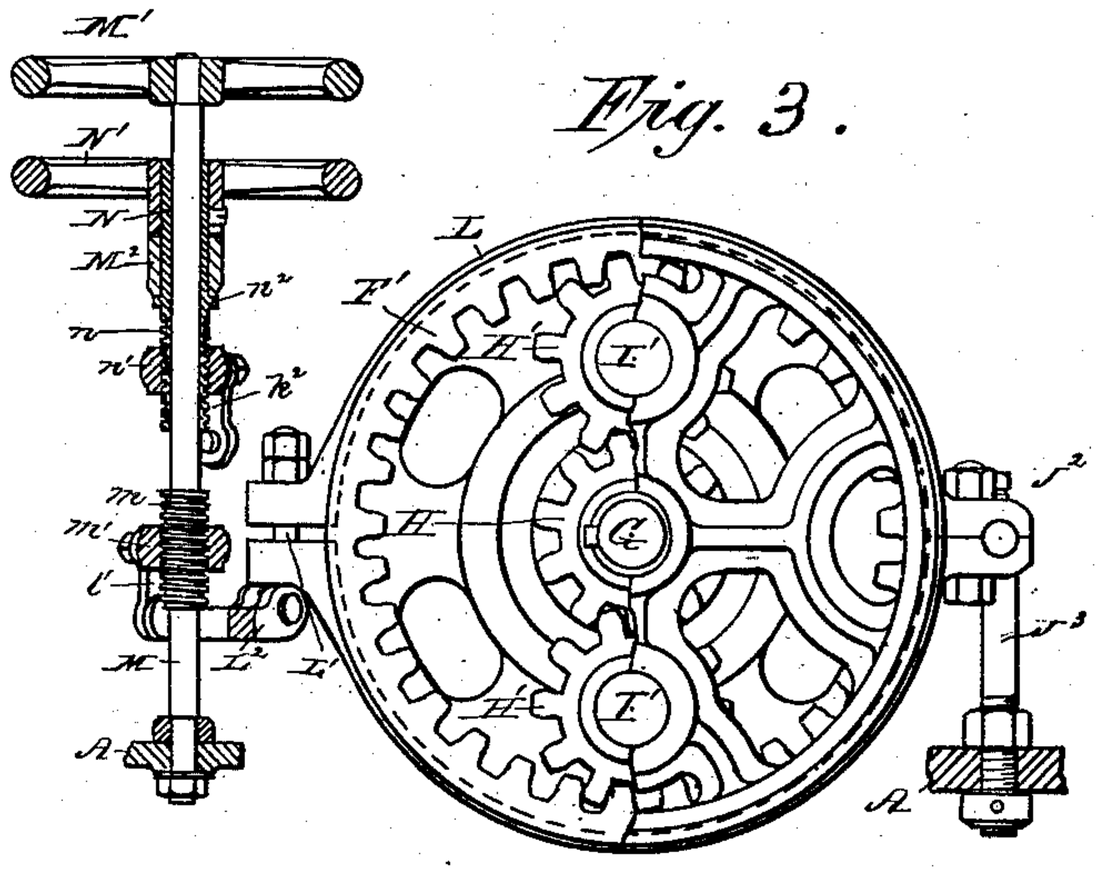


Fig. 6.

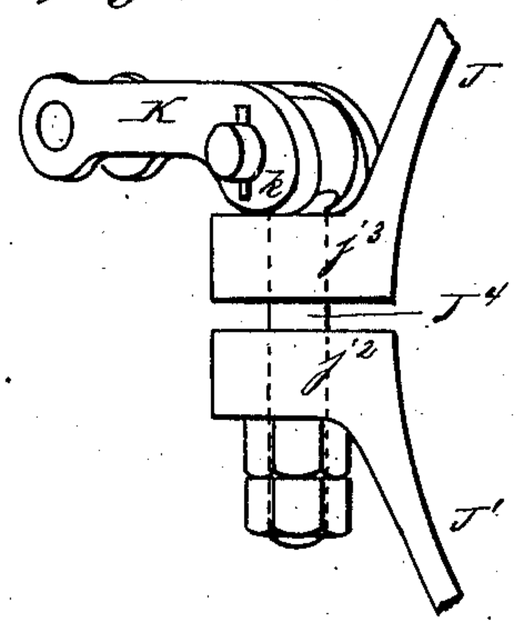
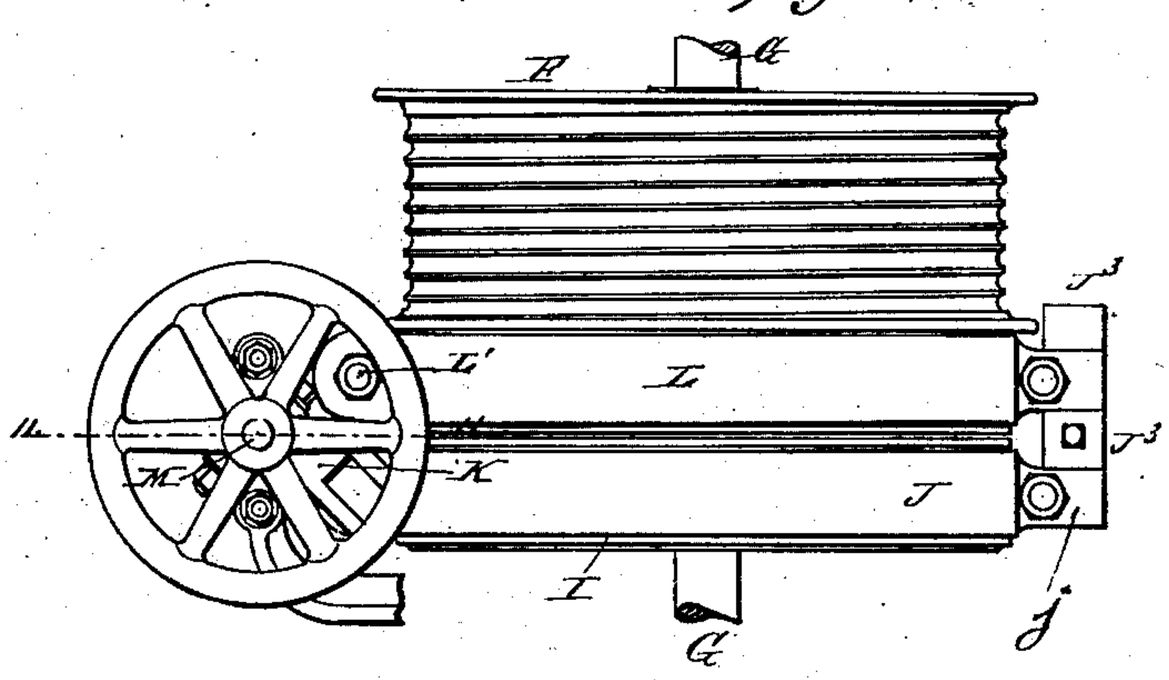


Fig 4



Witnesses:
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Chas. S. Heyer

Inventor,
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UNITED STATES PATENT OFFICE.

MILAN C. BULLOCK, OF CHICAGO, ILLINOIS.

HOISTING APPARATUS FOR STEAM ROCK-DRILLS.

SPECIFICATION forming part of Letters Patent No. 258,985, dated June 6, 1882.

Application filed June 24, 1881. (No model.)

To all whom it may concern:

Be it known that I, MILAN C. BULLOCK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Hoisting Apparatus for Steam Rock-Drills; 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, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this specification.

This invention relates more especially to that class of steam rock-drills the main or crank shaft of which is driven by a pair of steam-engines arranged at angles of forty-five degrees to a horizontal plane and at right angles to each other.

My improvement consists mainly in arranging the hoisting apparatus on the frame of the machine below the crank-shaft for the purpose of obtaining great strength and stability, combined with lightness and compactness.

It further consists of certain combinations of devices, which are set forth specifically in claims at the close of this specification, for operating the brakes of the hoisting apparatus.

In order that my invention may be fully understood, I have represented in the accompanying drawings, and will proceed to describe, a steam rock-drill embodying the same in the best form at present known to me.

Figure 1 is a front elevation of a steam rock-drill embodying my improvements. Fig. 2 is a vertical section thereof in the plane indicated by broken line 1 1 of Fig. 1. Fig. 3 is an end view of the hoisting-drum. Fig. 4 is a plan view of the hoisting-drum. Fig. 5 is a side elevation of the hoisting-drum. Fig. 6 illustrates the application of the cam-brake lever.

The same letters of reference refer to like parts in all the figures.

The various parts of the machine are mounted on the bed-plate A and its standards A' A^2 A^3. The cylinders B and C of the steam-angines are bolted to the bed-plate at reverse angles of forty-five degrees to the base thereof, with their piston-rods extending and converging upwardly toward the axis of the main or crank shaft D. The cylinders thus situated at right angles to each other are arranged so nearly opposite that their piston-rods may be connected by pitmen to the same double crank D′ of the crank-shaft. I prefer to make the cylinders of unequal bore, and to so construct and apply the steam induction and exhaust devices that the cylinders and their adjuncts may be used either jointly as a compound steam-engine or separately as two separate high-pressure steam-engines. I also prefer to use the variable and reversible eccentric E. (Shown in Fig. 2.) I claim neither of these features in this patent, as they are embodied and claimed in another application for Letters Patent filed in the Patent Office of even date with the application for this patent. I also prefer to mount the drill-spindle on a swivel-head such as shown, but which, being described and claimed in an application for Letters Patent filed January 27, 1881, I do not claim in this patent.

The hoisting-drum F is mounted to turn on the shaft G, which is supported in bearings on the standards A^2 and A^3 below the crank-shaft D. A large spur-wheel, G′, is keyed to shaft G, adapted to be driven by a spur-pinion, D^2, on the crank-shaft, the said pinion being so connected to the crank-shaft by feather and groove that it may be slid endwise thereon to throw it in and out of gear according as the hoisting apparatus is to be driven or not. The hoisting-drum is driven by the spur-wheel H fixed on shaft G, through the intermediate spur-wheels, H′, which mesh with the internally-toothed but externally-smooth brake-rim F′ on the hoisting-drum. The intermediate spur-wheels, H′, revolve on gudgeons I′, carried by the thrust-wheel I, which is mounted to turn freely on shaft G, but may be held stationary by means of the friction-strap encircling its grooved rim. This friction-strap is composed of two approximately-semicircular segments, J J′, provided with ears *j* and *j′* at one end, which afford facility for bolting them together, and for attaching this friction-strap to a cross bar or bolt, J^2, supported by standards J^3 J^3, rising from and secured to the bed-plate A, as shown in Figs. 3 and 4. The other ends of the segments also terminate in laterally-projecting ears j^2 and j^3, which are connected by an eyebolt, J^4, but will still be a little distance apart when the segments are drawn

together to tightly hug the thrust-wheel I. The nuts of the eyebolt are so adjusted that the wheel I can move freely in the friction-strap. The eye-head of the eyebolt J^4 is above the upper ear, j^3, and pivoted to it is a forked horizontally-projecting cam-lever, K, the cam-heads k of which bear on the upper side of said ear j^3, the cam-heads being so formed that by lifting the outer end or long arm of the lever its cam-heads will, in conjunction with the eyebolt, draw the segments of the friction-strap together and cause them to hug the thrust-wheel I.

A brake-strap, L, constructed in all particulars like the friction-strap above described, encircles the brake-rim F′ of the hoisting-drum, is secured to the same cross bar or bolt, J^2, to which the friction-strap is secured, and has the other ends of its segments in like manner connected by an eyebolt, L′, to the eye-head of which is pivoted a forked horizontally-projecting cam-lever, L^2; but the eye-head of eyebolt L′ is lowermost, so that the cam-heads of the lever L^2 bear on the under side of the ear of the lower segment of the brake-strap. The respective eyebolts and cam-levers are reversely arranged, in order that they may be operated in the same axial line without interference. The forks of the long arm of cam-lever L^2 are connected by links l and l' to a nut, m', on the screw-threaded portion m of the upright spindle M, which is, at its lower end, supported in and connected to the bed-plate, so that it may be turned axially, but cannot move endwise. The upper end of this spindle is provided with a hand-wheel, M′, for turning it.

The spindle also carries a long sleeve, N, fitted in a fixed yoke, M^2, which latter forms a bearing for the sleeved spindle near its upper end. The lower end, n, of the sleeve is screw-threaded, and carries a nut, n', to which the forks of the long arm of the cam-lever K are connected by links k' and k^2. A shoulder, n^2, on the sleeve is seated against the under side of yoke M^2, and immediately above the yoke a hand-wheel, N′, is fixed on the sleeve. Thus the sleeve may be independently turned on the spindle, but cannot move endwise. The cam-levers prevent the nuts to which they are respectively linked from turning, so that by turning the hand-wheels M′ and N′ the nuts will be compelled to travel up or down on the screw-threaded portions of the rotating spindle and rotating sleeve, whereby the friction-strap and brake-strap can be duly operated, either simultaneously or independently.

It will be observed that while the friction-strap may act as a brake, in conjunction with the thrust-wheel, to stop the hoisting-drum whenever the driving-pinion D^2 is thrown out of gear, it cannot so act when said driving-pinion is in gear and running; but the brake-strap on the hoisting-drum may be used to stop the drum while pinion D^2 is in gear and running, provided the friction-strap be opened to release thrust-wheel I.

The arrangement of the hoisting apparatus below the crank-shaft of the engine or engines brings it close down to the foundation of the machine, making the whole structure not only more compact, but also more stable, so that the parts may be made correspondingly lighter. The height of the machine and the size of the frame-work are also reduced thereby.

Usually the friction-strap is to be loosened simultaneously with tightening the brake-strap, and vice versa. Having the hand-wheels M′ and N′ one over the other makes it very convenient to operate one with the right hand and the other with the left hand to simultaneously operate the two straps in that way.

It is obvious that so far as the novel arrangement of the hoisting-drum is concerned it is immaterial whether the particular hoisting-drum hereinbefore described or any other known form of hoisting-drum is made use of, although I prefer the described form of hoisting-drum.

Having thus described my invention, what I claim is—

1. The combination, substantially as before set forth, of the steam-cylinders set at reverse angles of forty-five degrees on the bed-plate and at right angles to each other, the crank-shaft overhead, the hoisting apparatus below the crank-shaft, and the wheel and pinion for transmitting the motion of the crank-shaft to the hoisting apparatus.

2. The combination, substantially as before set forth, of the segments of the brake-strap, the eyebolt, the cam-lever, the screw, and the traveling nut connected with the cam-lever to prevent said nut from turning.

3. The combination, substantially as before set forth, of the brake-strap, the friction-strap, the screw-spindle, screw-threaded sleeve thereon, and the two traveling-nuts for operating the cam-levers of the brake-strap and friction-strap, one nut being fitted on the screw-spindle and the other on the screw-threaded sleeve.

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

MILAN C. BULLOCK.

Witnesses:
CHAS. W. GRIGGS,
J. EDWARDS FAY.