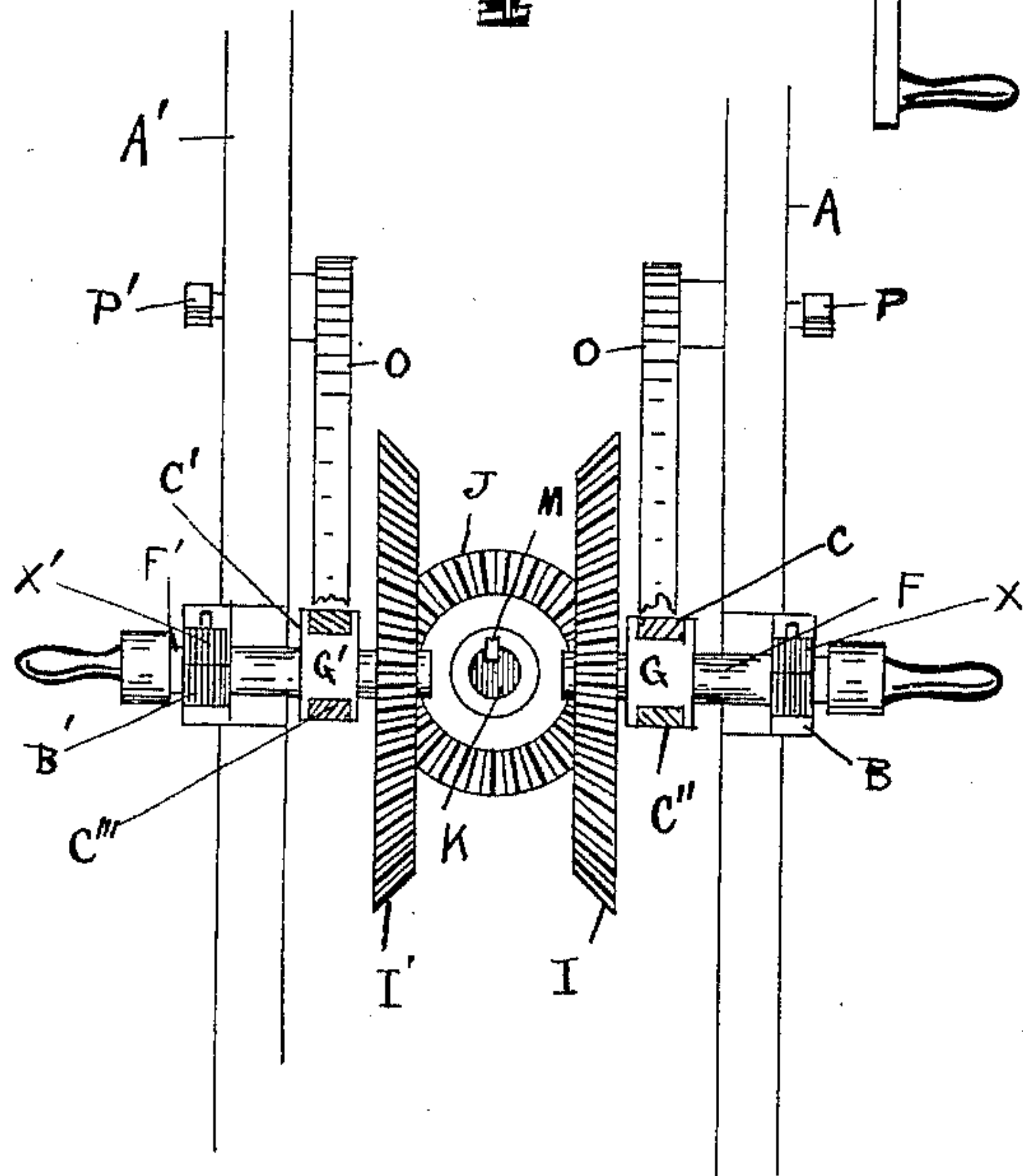
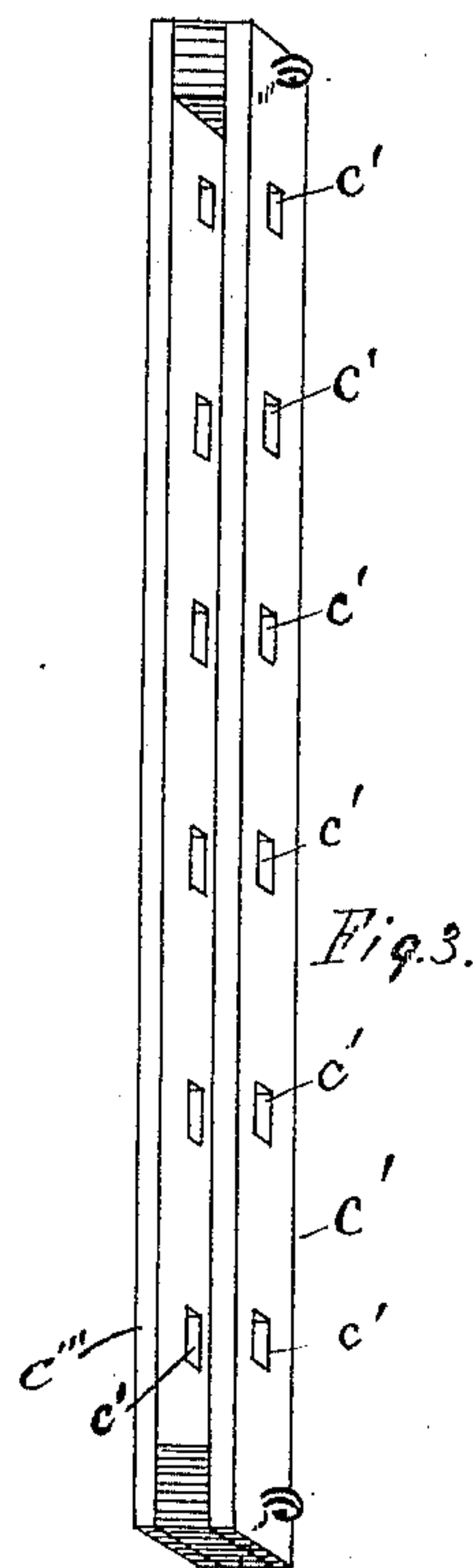
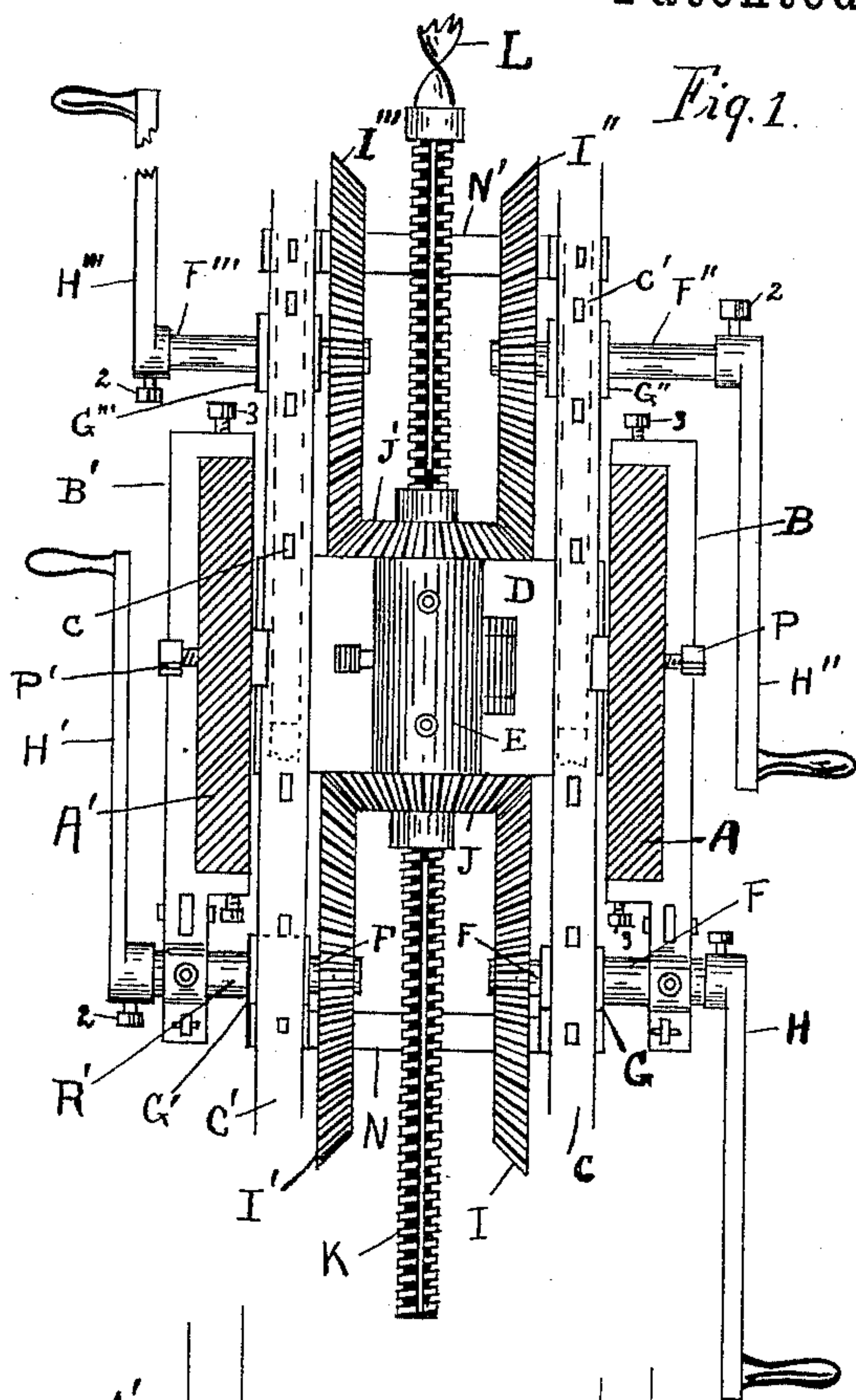


3 Sheets—Sheet 1.

COAL OR ROCK DRILL.

Patented Sept. 23, 1890.



Witnesses.  
L. M. Threlton  
J. W. Wells.

Inventors  
Isaac Wantling  
James T. Johnson  
By W. V. Jefft Atty.

(No Model.)

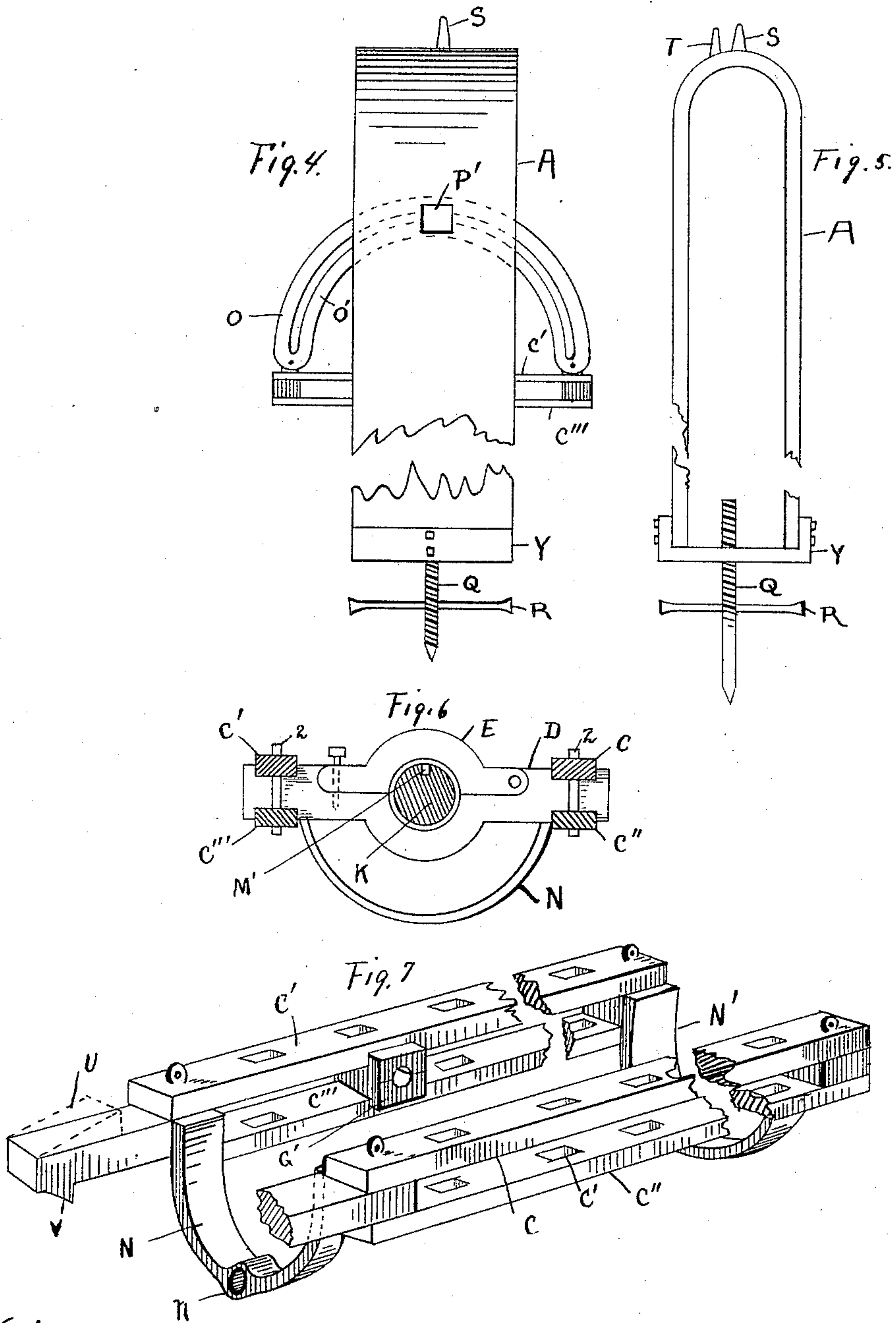
3 Sheets—Sheet 2.

I. WANTLING & J. T. JOHNSON.

COAL OR ROCK DRILL.

No. 436,815.

Patented Sept. 23, 1890.



Witnesses

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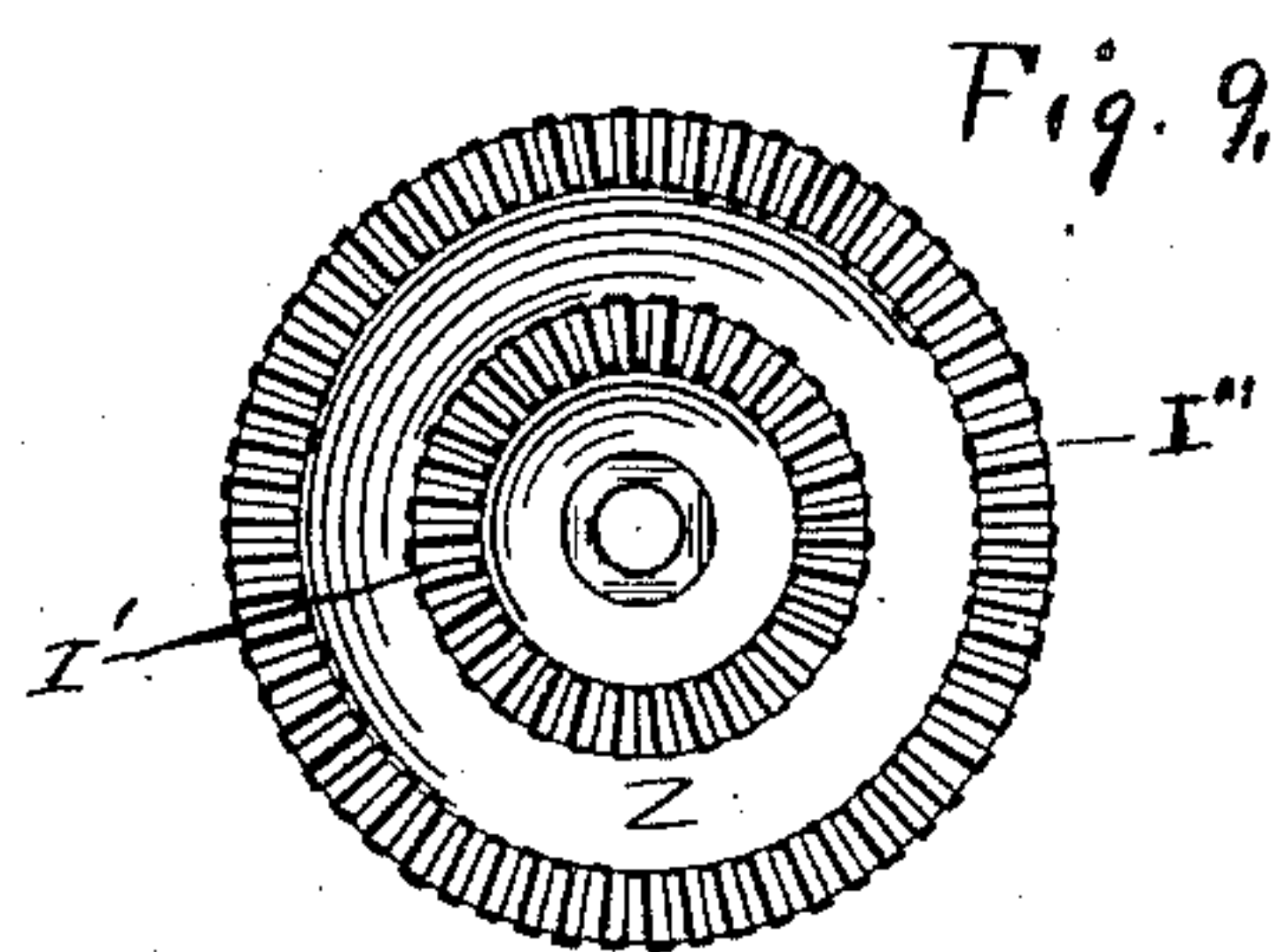
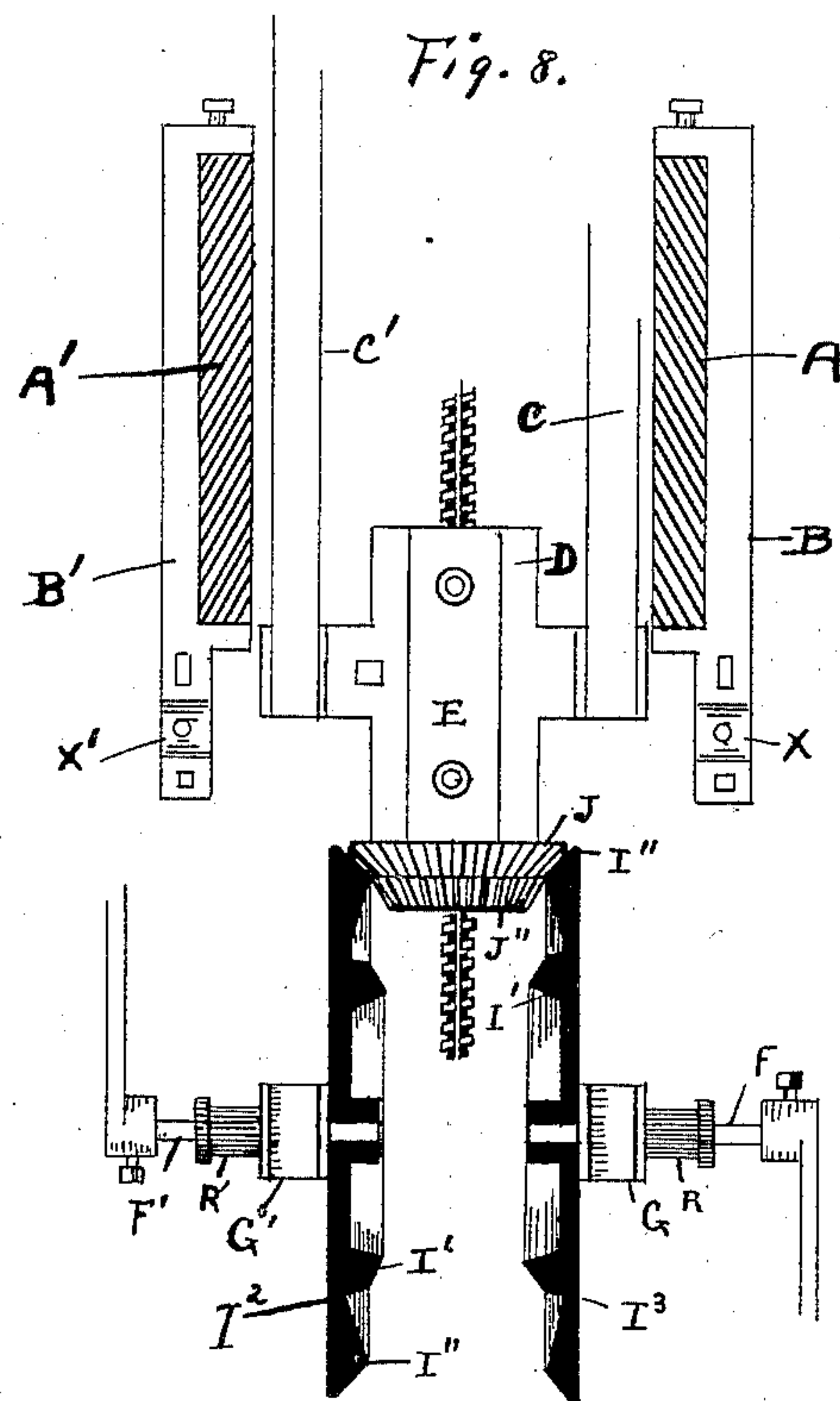
(No Model.)

3 Sheets—Sheet 3.

I. WANTLING & J. T. JOHNSON.  
COAL OR ROCK DRILL.

No. 436,815.

Patented Sept. 23, 1890.



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# UNITED STATES PATENT OFFICE.

ISAAC WANTLING AND JAMES T. JOHNSON, OF PEORIA, ILLINOIS.

## COAL OR ROCK DRILL.

SPECIFICATION forming part of Letters Patent No. 436,815, dated September 23, 1890.

Application filed July 2, 1890. Serial No. 357,484. (No model.)

*To all whom it may concern:*

Be it known that we, ISAAC WANTLING and JAMES T. JOHNSON, citizens of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Coal or Rock Drills; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to certain new and useful improvements in coal or rock drilling machines, by means of which a drill is provided which is durable and efficient in its working; and more particularly it relates to that class of drills which are designed to operate by means of gear attachments, making it possible to operate the same from either side of the drill mechanism, and, further, to that class of drills which are capable of various adjustments to accommodate itself for drilling in any desired direction or position, and combines the advantages of adapting itself to light or heavy drilling by the attachment or detachment of certain gear mechanism.

That our invention may be more fully understood reference is had to the accompanying drawings, in which—

Figure 1 is a plan view of our improved drilling-machine. Fig. 2 is a detail end view of our improvement. Fig. 3 is a detail view of a frame-work purposed to carry boxings, the same being a part of our improvement. Fig. 4 is a side view of our improved drilling mechanism, showing the main frame and the frame-work for carrying the boxings. Fig. 5 is a detailed view showing an end view of the main frame-work. Fig. 6 is an end view of a connecting-brace, against which bears a gear-wheel. Fig. 7 is a detailed view of the frame-work purposed to bear the boxings. Fig. 8 is a detail plan view showing a modification in our improved drill. Fig. 9 is a detail view showing a double-beveled gear-wheel.

In Fig. 1, A A' are the sides of the main-frame construction. B B' are bearing-plates held in position by means of the set-screws. C C' are the upper portions of a frame-work designed to carry boxings. D is a boxing bearing at either side in the frame-work, of which C C' are the upper portions. E is a

hinged section, which forms a complete boxing with the section D. The said section E is secured in position by a suitable set-screw. F F' F'' F''' are shafts, which bear at their respective ends the crank-arms H H' H'' H''' and the beveled cog-wheels I I' I'' I''', the shafts F F' being carried in the sleeves R R'. G G' G'' G''' are boxings carried in the frame-work, the upper sections of which are designated by C C', and in which said boxings are carried the shafts F F' F'' F'''. J J' are beveled gear-wheels carried upon the drill-stock K, and which said gear-wheels mesh with the beveled gear-wheels I I' I'' I'''. L is the drill. N N' are semicircular braces or ties which connect the frame-work of which C C' is the upper portion, and which said frame-work is more particularly described in Fig. 7. c c' are openings for the reception of pins which are purposed to hold the boxings in position. P P' are set-screws purposed to operate in connection with an arc provided with a slot, the purpose of which is shown in Fig. 4.

In Fig. 2, A A' refer to the sides of the main frame. B B' are bearing-plates designed to carry the sleeves R R', which said sleeves are journaled in the boxings X X' in such a manner as to be easily removed therefrom. F F' are shafts working in the sleeves R R'. C C' C'' C''' form a frame-work in which are carried the boxings G G'. O O are arcs provided with a slot, which said arcs are attached at their respective ends to the positions C C' C'' C''', and the said slotted arcs are stayed in any desired position by means of the set-screws P P'.

In Fig. 3, C'' C''' are frame-pieces provided with the holes c'.

In Fig. 4, A is one side of the main frame, with the spur S at its upper portion and provided with the plate Y at its lower portion. Q is a thread-bar carried in a threaded opening at the central portion of the plate Y. R is a twist-bar carried in a perforation in the thread-bar Q. C' C''' are frame-pieces of the frame-work designed to carry the boxings hereinbefore described. O is an arc provided with the slot O' and attached at either end to the frame-work C' C'''. P' is a set-screw working in connection with the slot O' in the arc O to stay it in the desired position, which, it will be seen, is of advantage



when it is desired to fix the machine to drill in a certain desired position.

In Fig. 5, A is the main frame-work, which is provided at its upper portion with the spurs S T, the spur T being shorter than the spur S. Y is a base-plate, the central portion of which is provided with a threaded opening in which is carried and operated the thread-bar Q. R is a twisting-bar.

In Fig. 6, C C' C'' C''', together with the semicircular frame-piece N, form the frame-work hereinbefore described, in which are carried the boxings. D is the lower and main section of a connecting-brace designed to form a bearing-point for a cog-wheel. E is the top section or cap, being properly hinged and provided with suitable set-screws to fix it firmly over the thread-bar, which said cap E, in connection with the lower section D, together form a complete connection-brace for a cog-wheel used at points beyond the main boxing, (which is designated by the same letters,) and is carried in the frame-work C C' C'' C''' and held in position in the said frame-work by means of the pins *i i'*. M' is a keyway in the thread-bar.

In Fig. 7, C C' C'' C''', together with the semicircular frame-pieces N N', form a frame-work in which are carried boxings, one of which is here represented by G'. V refers to a grip-bar in the end of the frame-work, designed to hold the frame in position when it is desired to dispense with the main-frame portion A A'. (Shown in preceding figure.) n is the semicircular frame-piece. N is a threaded opening designed to carry a thread-bar, which may be used as a grip-bar by screwing the same into the body of the coal or mineral when it is desired to dispense with the other supporting means of the frame-work which carries the boxings and drilling mechanism. U refers to a wedge.

In Fig. 8, A A' are the sides of the main frame. B B' are bearing-plates fixed to the main frame by means of suitable set-screws and carrying on their forward ends the boxings X X'. C C' are the upper portions of the frame-work designed to carry the boxing D and other boxings, as hereinbefore described. The said boxing D is purposed to carry the thread-bar. E is the cap or upper section of the boxing D. J is a beveled gear-wheel carried at the end of the boxing and upon the thread-bar. F F' are shafts bearing on their respective ends suitable crank-arms and the double-beveled cog-wheels I I, having the two sets of beveled cogs I' I'', either of which sets of beveled cogs may be made to mesh with the beveled cog-wheel J, as may be desired, the purpose of which will be more fully explained hereinafter. The shafts F F' are carried in the sleeves R R'. In this figure it is shown that the boxing is drawn out and the sleeves detached from their bearings or boxings X X', in which position it will be seen that the double-beveled cog-wheels may be made to mesh with the beveled cog-wheel J,

with either the outer or inner set of cogs, and again adjusted properly in its bearings X X'.

In Fig. 9, I' I'' designate the sets of cogs.

By reference to Fig. 1 it will be seen that the main frame A A', being adjusted in a perpendicular position, is designed to carry the bearing-plates B B'. The said bearing-plates B B' are capable of various adjustments upon the sides of the main frame. When it is desired to raise or lower the machine in adjusting it for drilling, it is accomplished by loosening the set-screws, which enables the bearing-plates to be raised or lowered upon the frame-work to accommodate the drilling in any position or height desired and is fixed in that position by tightening the said set-screws. At the forward end of the bearing-plates B B' the boxings X X' are provided, which form journal-bearings for the sleeves R R', and within the said sleeves R R' are carried the shafts F F', upon which shafts are carried at their respective ends the crank-arms H H' and the cog-wheels I I'. The said sleeves R R' also form a bearing for the frame-work C C' C'' C''', the said sleeves R R' carrying on their inner ends suitable boxings which are purposed to slide back and forth in the frame-work C C' C'' C''' as desired, and may be fixed in any desired position by the insertion of keys in the openings provided in the frame-work, which said openings are of such distance apart that the boxings G G' fit perfectly between them and are thus held firmly in position by means of the said keys. It will further be seen by reference to Fig. 1 that another set of cogs, shafts, and crank-arms may be attached and made to operate in connection with the drill mechanism. The complete operation in this figure is evident. The boxings D are carried in the frame-work C C' C'' C''' the same as the boxings G G', and are held in position by the same means and are capable of adjustment within the frame-work by sliding back and forth in the same. The boxings D, carrying the thread-bar K, which is threaded to correspond with the threads in the boxing formed by the parts D E, have the beveled gear-wheels J J' contacting with their respective ends, the said cog-wheels being carried upon the thread-bar K. The shafts F'' F''' are carried in the boxings G'' G''', and on the ends of the said shafts are borne the shafts H'' H''' and the beveled cog-wheels I'' I''', which said beveled cog-wheels I'' I''' mesh with the beveled cog-wheels J' in the same manner as the cog-wheels I I' mesh with the cog-wheel J, thus making it possible for four men to work with the machine at the same time. It will further be seen by the examination of Fig. 1 that the frame-work C C' C'' C''' may be continued out indefinitely, and by supplying new boxings, connecting-braces, gearing, shafts, and crank-arms an indefinite amount of power may be applied; or by reference to Fig. 8 it will be seen that the advantage of speed or power, whichever may be desired, is gained through the adjustment of



the double-beveled cog-wheel to suit the application desired. It will be seen that by properly adjusting the double-beveled cog-wheels I I' to mesh with the cog-wheel shown in Fig. 8 the advantage in the speed is gained whereby adjusting the double-beveled cog-wheels I I', so that the inner set of bevels mesh with the cog-wheel J'', the advantage of power is gained at a sacrifice of speed. Either this construction or the one previously shown may be used.

In Fig. 4 it will be seen that the arc O, being attached to the frame-work in which the boxings and drilling mechanism are carried, renders it possible to adjust the machine at any desired angle and fix it in that position by means of the slot and set-screw working in combination with the main frame A A'. It will further be seen, with reference to the adjustment of the machine to drill in the various positions, that it can be so adjusted as to drill in a perpendicular position, because of the bearing-plates B B' extending out beyond the main-frame portion and providing a bearing which forms the journal or axis of rotation.

By reference to Figs. 4 and 5 the use of the spurs S T and the thread-bar Q will be seen. When it is desired to fix the frame in a given position, the rotation of the thread-bar Q by means of the twist-bar R in the proper direction will raise the frame, and when it is raised until the spurs S T are embedded in a surface it will be seen that the frame will be held rigidly in that position, and when it is desired to change the direction of the frame it is accomplished by turning the thread-bar in the proper direction until the shorter spur T is relieved from contact, when it may be easily turned to any position or direction and can again be fixed rigidly, as before explained.

In operation, the machine proper being first adjusted in the desired position and in readiness to drill, it will be seen that the rotation of the crank-arms H H' H'' H''', the arms H H'', and the arms H' H''' in opposite directions will rotate the cog-wheels I I' I'' I''' also in opposite directions, since the crank-arms and cog-wheels are upon the same shafts, which said cog-wheels I I' I'' I''', meshing with the cog-wheels J J', rotate the said cog-wheels J J' in the same direction, and since the beveled cog-wheels J J' are made to engage the drill-stock K by means of the spline or key M working loosely in the groove or keyway M', it necessarily rotates the drill-stock, which said drill-stock, bearing in the threaded boxings D E, causes the said drill-stock to travel backward or forward, according to the direction of the rotation of the crank-arms. The drill-stock K, by means of the spline M, working loosely in the groove M', is allowed a forward or backward movement. A drill being fixed in a socket at the end of the drill-stock, the movement of the said drill necessarily follows the movement of the drill-stock, thus performing the operation of drilling. It will be seen that by means of

the gearing herein shown and described the rotation of the drill is greatly facilitated—that is, that the speed is greatly increased and steadiness of movement and equalization of power are gained.

The speed of the movement of the drill may be varied by changing the relative sizes of the cog-wheels I I' I'' I''', and the power may be increased by lengthening the crank-arms, and, as before described, an indefinite amount of power may be had by the addition of boxings, connecting-braces, gearing, shafts, and crank-arms properly adjusted in the frame-work C C' C'' C''' and the gearing made to properly mesh.

As before described, the machine may be raised or lowered upon the main frame to accommodate itself to different heights in which it may be desired to drill, and it is also capable of another adjustment—viz., the adjustment at different angles. It will be seen by reference to Fig. 1 that the frame-work, with the drill, may be tilted in any position, and in fact can be made to perform a complete revolution about its bearing or axes, which are the sleeves R R', without in any way affecting the operation of the machine, as the cog-wheels I I' will always mesh with the cog-wheel J whatever the adjustment may be, since the frame-work C C' C'' C''' and the cog-wheels I I' have substantially the same axes of rotation, which are the sleeves R R' and the shafts F F', carried in the said sleeves R R'.

The operation of the modification, as shown in Fig. 8, may be easily understood when it is seen that the boxing D, with its cap E, has a slightly different form from the boxings shown in the other figures—viz., the sides are cut away, so as to permit the shifting of the double-beveled cog-wheels into a position to mesh with the inner set. By this modification of the boxing space is given for the overlapping portions of the cog-wheels I I'. In other respects its operation is the same as that described in connection with Fig. 1, the same adjustments may be made, and the same speed or power had, the particular advantage in this particular construction being that when in drilling, the outer set of cogs meshing with gear-wheel J, the drill chances to contact with a hard substance the difficulty is overcome by the adjustment of the wheels I I' so that the inner sets of cogs I' are made to mesh with the cog-wheel J'', whereby double power is gained.

Having thus fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a coal-drilling machine, the main frame A A', having the spurs S T, of unequal lengths, at its upper portion, the base-plate Y, provided with a threaded opening at its central portion, the thread-bar Q, working in the threaded opening of the base-plate and having the twist-bar R, the frame-work composed of the parts C C' C'' C''', with the semicircular



frame-pieces N N', the said frame-pieces C C' C'' C''' being provided with a series of openings for the reception of pins and separated with suitable blocks or boxings to form  
5 slots for carrying the boxings, all in combination, substantially as described and set forth.

2. In a coal-drilling machine, the main frame A A', having the spurs S T, of unequal  
10 lengths, at its upper portion, the base-plate Y, provided with a threaded opening at its central portion, the thread-bar Q, working in the threaded opening of the base-plate and having the twist-bar R, the bearing-plates B B',  
15 with suitable set-screws and carrying at one of their respective ends the boxings X X', in which bear the sleeves R R, on the inner ends of which sleeves are the boxings G G', the frame-work composed of the parts C C' C''  
20 C''', in which are carried the boxings G G', the shafts F F' F'' F''', which bear on their respective ends the crank-arms H H' H'' H''', and the beveled cog-wheels I I' I'' I''', the beveled gear-wheels J J', and the boxing formed  
25 by the parts D E, which is carried in the frame-work C C' C'' C''', internally threaded,

and in which travels the drill-stock K, all in combination, substantially as described and set forth.

3. In a coal-drilling machine, the main  
30 frame A A', with the spurs S T, of unequal lengths, the base-plate Y, the thread-bar Q, having the twist-bar R, the bearing-plates B B', having the boxings X X', the sleeves R R', which bear the boxings G G' and by which  
35 the shafts F F' are carried, the frame-work C C' C'' C''', in which the boxings G G' are carried, the boxings formed of the parts D E, internally threaded, the shafts F F', bearing on one end suitable crank-arms, the double-  
40 beveled gear-wheels I I, having the double set of cogs I' I'', and the cog-wheels J J'', carried upon the drill-stock which bears in the boxings D E, all in combination, substantially as described and set forth.  
45

In testimony whereof we affix our signatures in presence of two witnesses.

ISAAC WANTLING.

JAMES T. JOHNSON.

Witnesses:

BOB M'CORMICK,

E. T. MOORE.