

(No Model.)

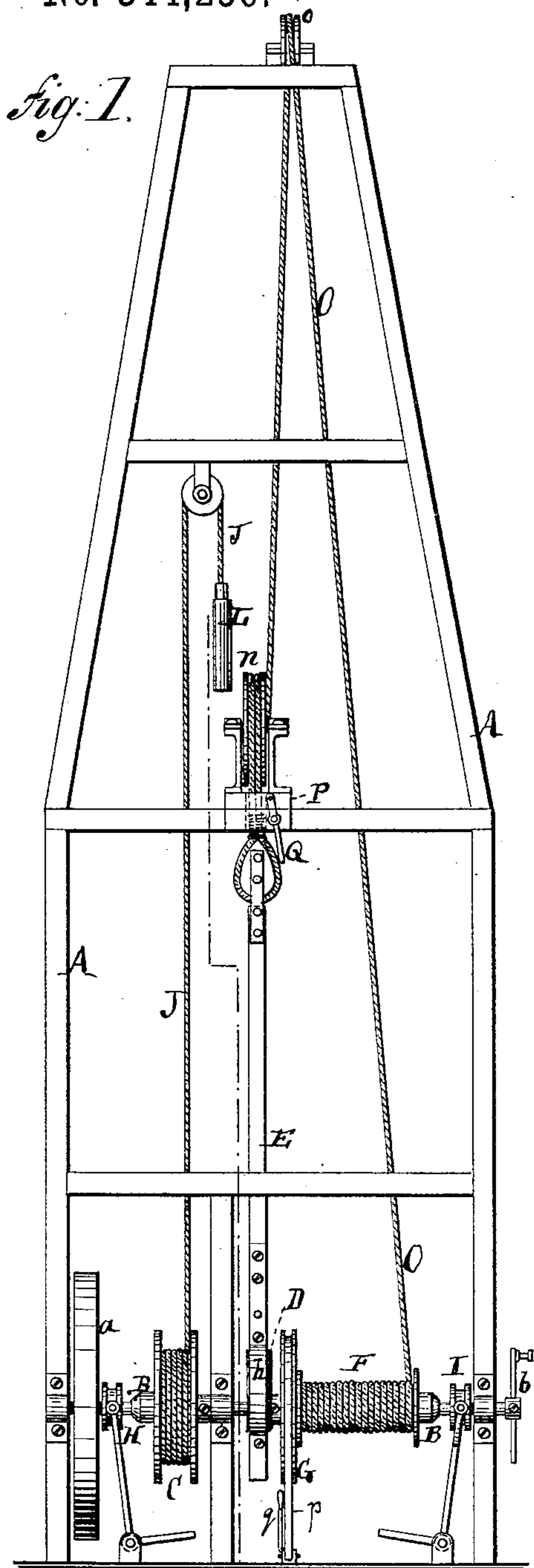
2 Sheets—Sheet 1.

D. DULL.

DRILLING MACHINE.

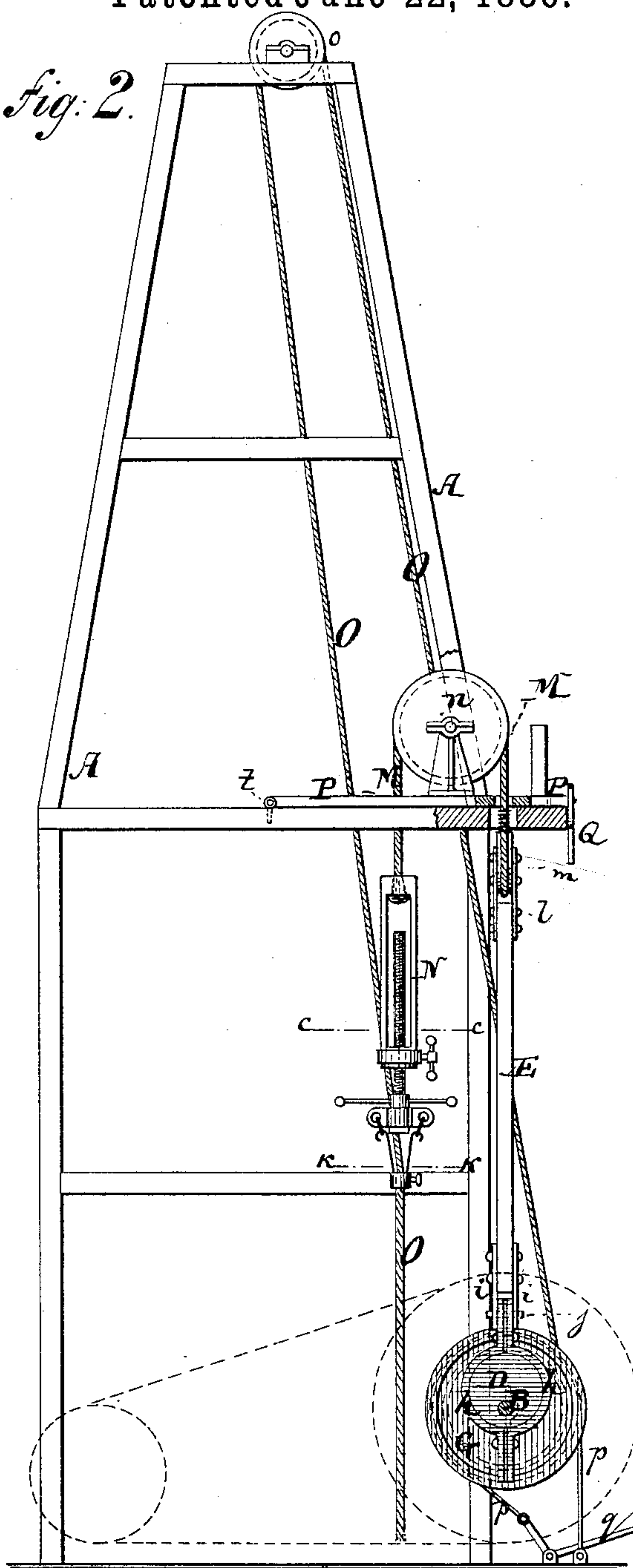
No. 344,256.

Patented June 22, 1886.



WITNESSES:

A. Schehl.
John M. Speer.



INVENTOR

Daniel Dull.

BY *Briesen & Steele*

ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

D. DULL.
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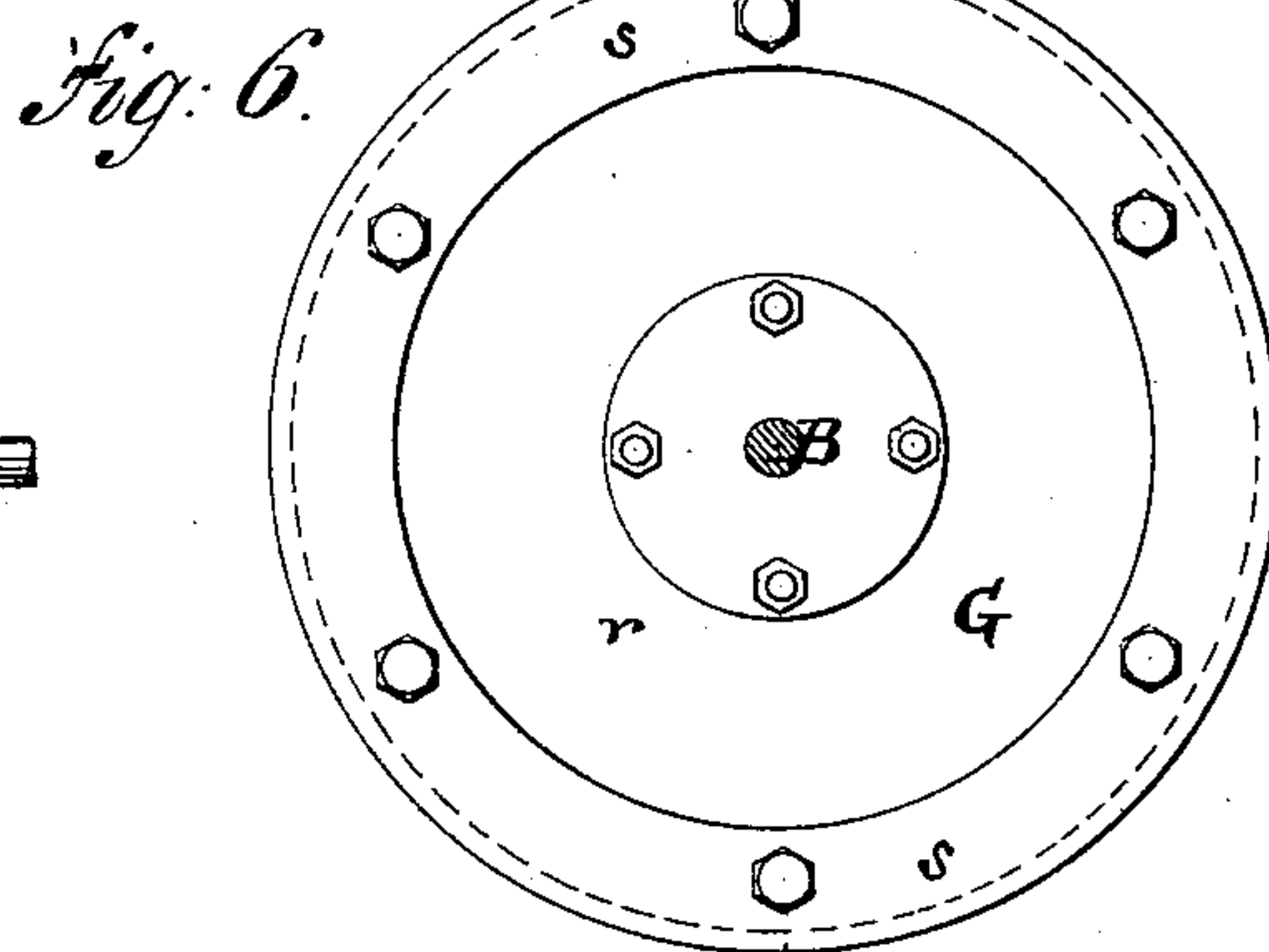
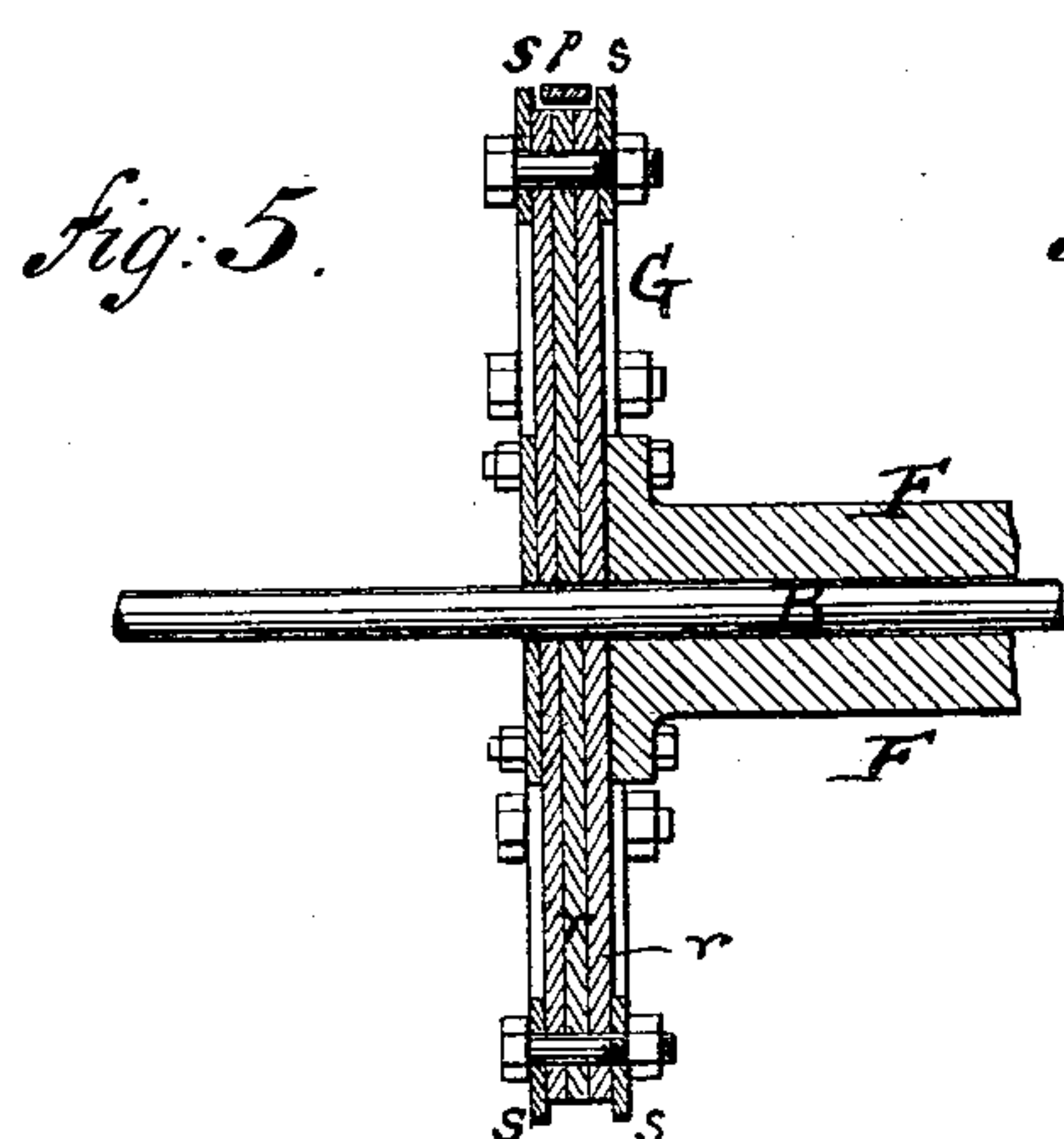
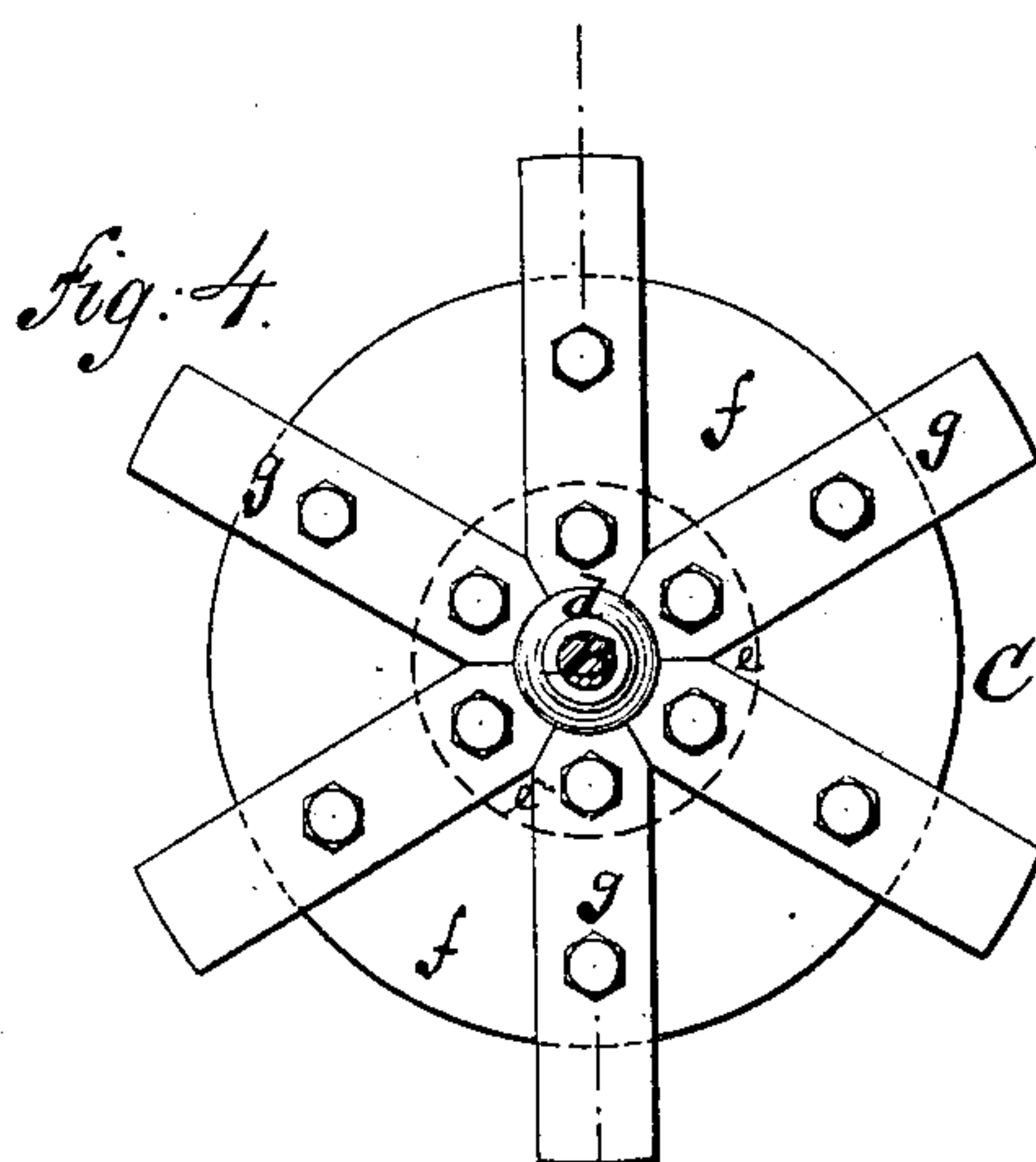
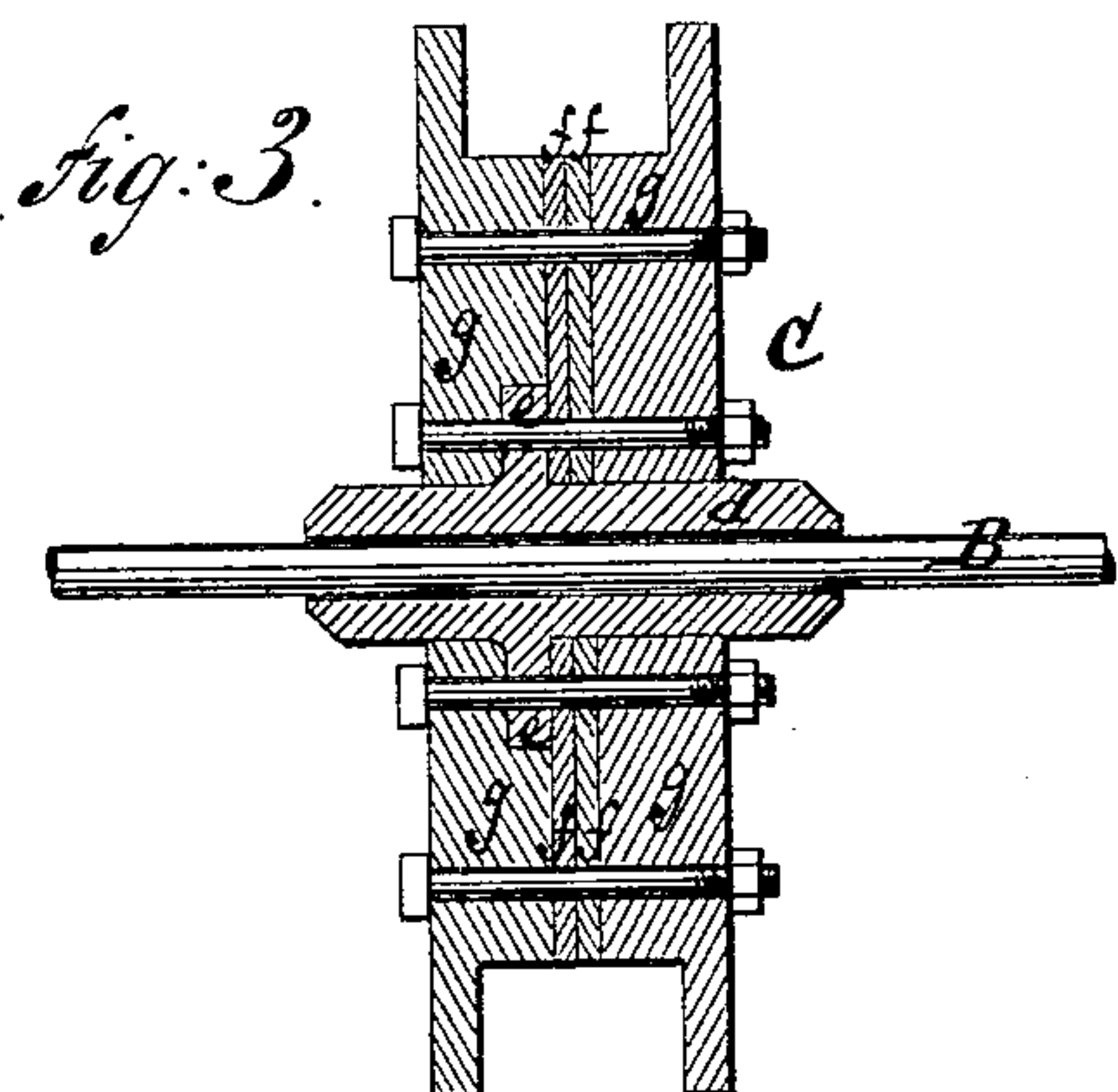


Fig. 7.

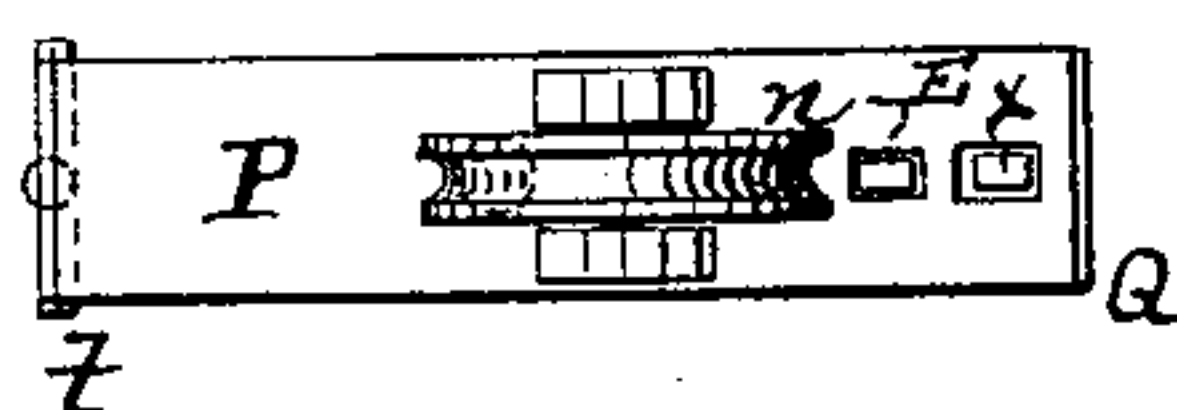


Fig. 9.

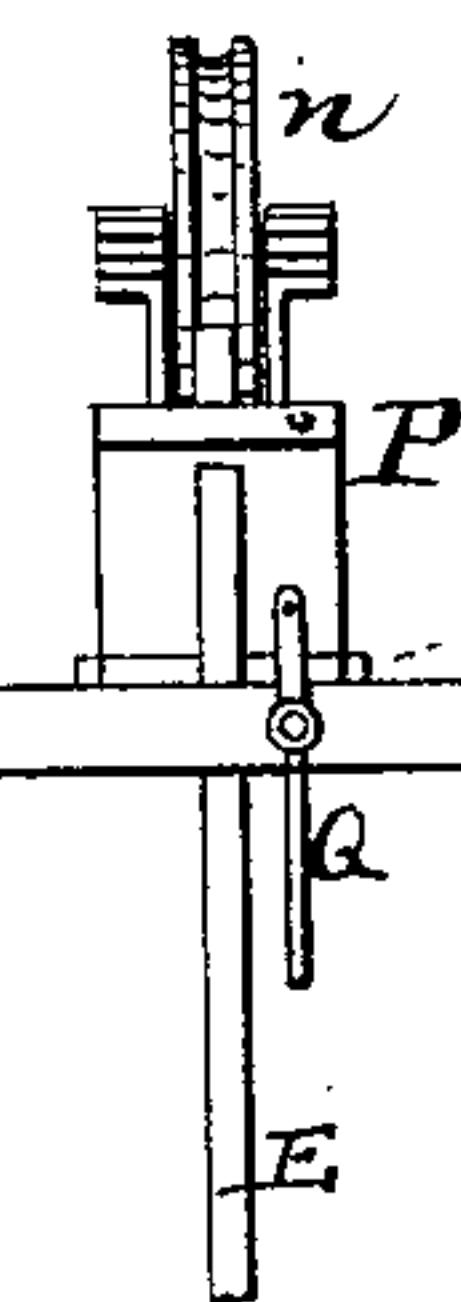


Fig. 8.

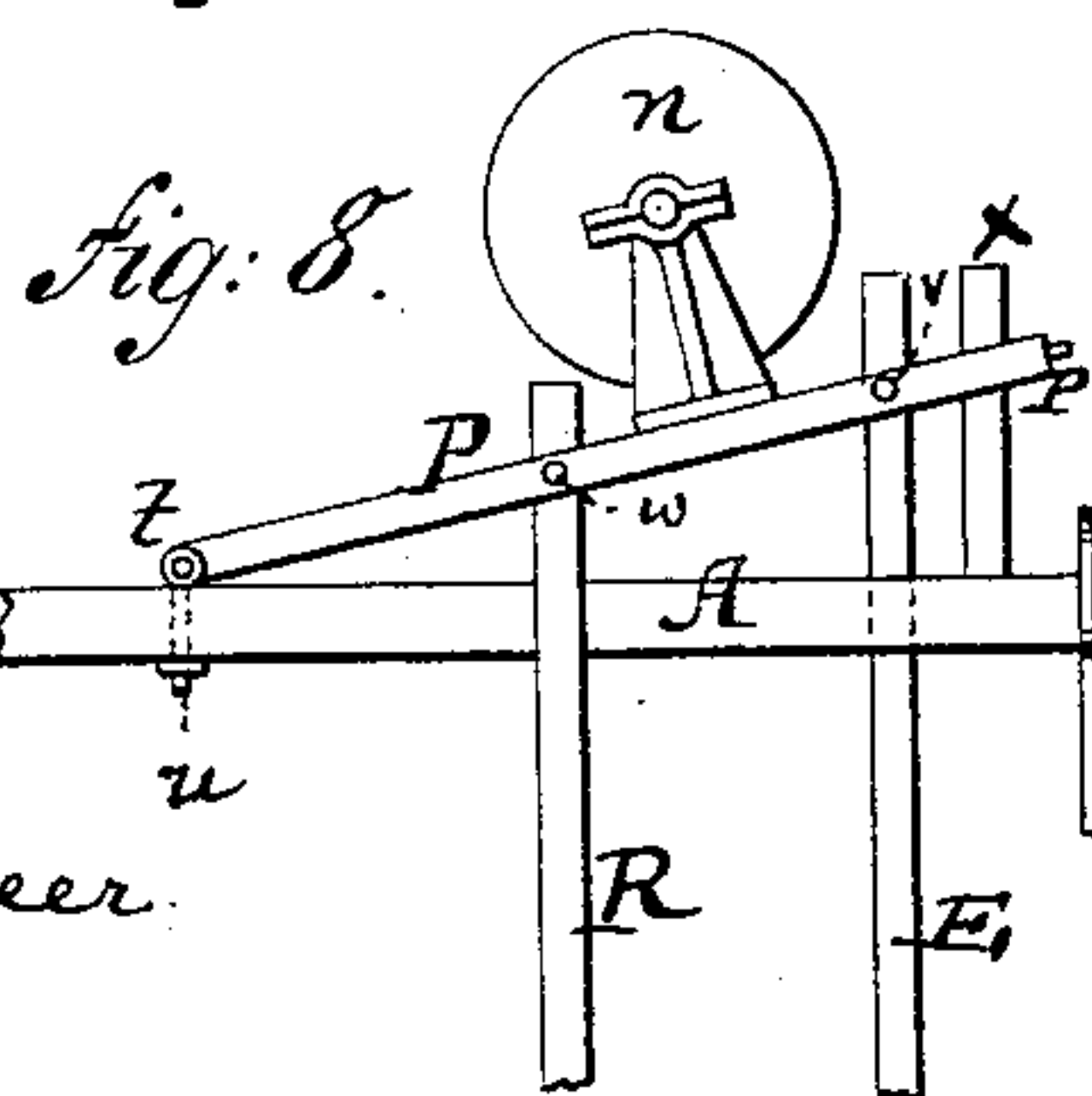


Fig. 10.

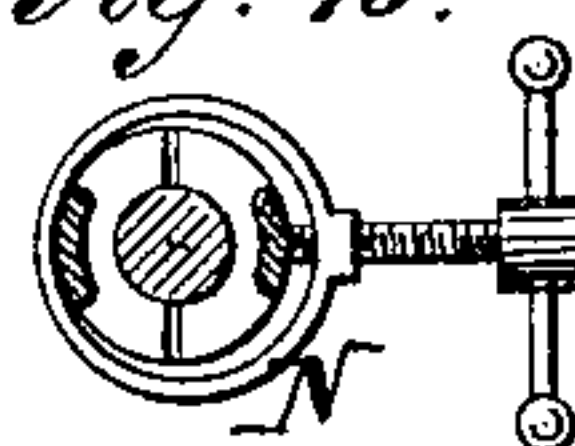


Fig. 11.



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UNITED STATES PATENT OFFICE.

DANIEL DULL, OF NEW YORK, N. Y.

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 344,256, dated June 22, 1886.

Application filed September 12, 1885. Serial No. 176,907. (No model.)

To all whom it may concern:

Be it known that I, DANIEL DULL, a resident of New York, in the county and State of New York, have invented an Improved Drilling-Machine, of which the following is a full, clear, and exact description, reference being made to the accompanying drawings, in which—

Figure 1 is a front elevation of my improved drilling-machine. Fig. 2 is a side elevation of the same. Fig. 3 is an enlarged central section of the sand-reel which is used in the machine. Fig. 4 is a face view of that sand-reel. Fig. 5 is a central section of the brake-wheel; Fig. 6, a face view of the same; Fig. 7, a top view of the pulley over which the rope controlling the drilling-tools passes; Fig. 8, a side view thereof, and Fig. 9 an end view of the same. Fig. 10 is a horizontal section of the temper-screw on the line *cc* in Fig. 2, and Fig. 11 is a horizontal section of the same on the line *kk* in Fig. 2.

This invention relates to a new machine for drilling wells, being applicable more particularly to the drilling of deep wells.

The object of the invention is, principally, to economize in the cost of the machine by compacting the parts as thoroughly as possible; and the invention consists in the novel combinations of parts hereinafter specified.

In the drawings, the letter A represents the main framing of the drilling-machine, in the lower part of which is hung a driving-shaft, B. To the driving-shaft B rotary motion is imparted by a belt from a suitable engine, said belt passing around a driving-wheel, *a*, which is mounted upon the shaft B.

Fig. 2 indicates by dotted lines the connection between the shaft B and the driving-engine.

The wheel *a* in an ordinary drilling-machine, such as I propose making, should be about seven feet in diameter. The shaft B carries also a sand-reel, C, being a reel intended to hold the sand-pump suspended and to let it down when necessary; also a cam, D, which is intended to operate the pitman E, that reciprocates the drilling-tools. Further, the shaft B carries a drum, F, which is connected with the rope from which the drilling-tools are suspended. This drum F has mounted

upon it also a brake-wheel, G. The reel C is loose on the shaft B, but can be thrown into action by a clutch, H. In like manner the drum F is loose upon the shaft B, but can be thrown into action by a clutch, I. These clutches H and I are of ordinary construction and need not here be further described. The shaft B at one end is also shown to carry a sliding crank, *b*, which during the rotation of the shaft may be connected with a bellows whenever it is desired to use such bellows for the shaping of the drilling-tools.

The sand-reel C is more clearly represented in Figs. 3 and 4 of the drawings, and it is of a peculiar construction, which I will now proceed to explain.

Upon a hub, *d*, which surrounds the shaft B, is mounted a peripheral flange, *e*. Against the face of this flange are placed two planks, *ff*, which are both of wood, of annular form, and placed against one another with their grain crossed. Against the outer side of these planks are placed the reel-arms *g*, as clearly shown in Figs. 3 and 4. The outer ends of these reel-arms project beyond the peripheries of the planks *f*, and on their inner faces these arms are notched out down to the peripheries of these planks, all as shown in Fig. 3.

Suitable bolts unite the planks *f* and arms *g* to one another and to the flange *e* of the hub *d*.

In practice I find that the outer periphery of the reel C should be about four feet, the planks *f* being each about one inch in thickness, while each reel-arm *g* is about six inches thick.

The notch or groove around the reel is about ten inches wide and six inches deep. This gives ample room to wind onto said reel the rope J, from which the sand-pump L is suspended—that is to say, during the operation of drilling the sand-pump L will be held in the elevated position shown in Fig. 1 by coiling the rope J upon the reel C, but from time to time, whenever the sand-pump is to be put in operation, the clutch H is moved to throw the reel C into operation, and the sand-pump is then let down and afterward drawn up again by the reel.

The cam D, which is to reciprocate the drilling-tools, is surrounded by a strap, *h*, which

is in two parts, as shown in Fig. 2, both parts being bolted together through their projecting parallel arms. The pitman E is connected to the two-part strap *h* by plates *i*, which are bolted to the sides of the pitman and pivoted at *j* to one of the arms that project from said strap. On the pivot *j* the pitman E is permitted to vibrate in one direction. The upper end of the pitman E is connected by bolted plates *l* with a block, *m*, around which a rope, M, that connects with a temper-screw, N, is placed. This rope M, which in the machine is about two inches in diameter, passes around a pulley, *n*, that is supported by the main frame-work, as hereinafter more fully described. The temper-screw N is of the ordinary construction—that is to say, it is not of my invention. It serves to connect the rope M with another rope, O, from which the drilling-tools are suspended. One end of the rope O is secured to the drum or bull-wheel F, from which the rope O passes around a friction-pulley, *o*, and thence down to the temper-screw N. The bull-wheel F carries a brake-wheel, G, which is surrounded by a brake-strap, *p*, that can be worked by a lever, *q*. When the drilling operation is going on, the shaft B being revolved reciprocates by means of the cam D the pitman E. This in turn reciprocates the temper-screw and this raises and lowers alternately that end of the rope O which carries the drilling-tools, forcing the latter in the downward stroke against the substance to be drilled. As the drilling-tools progress in their downward course, the temper-screw is lengthened until its extreme elongation of about six feet is attained, when the temper-screw is again shortened and made to take a new bite on the iron part of the rope O, whereupon operations are continued as before. Whenever necessary, the brake-lever *q* is swung down to tighten the strap *p* against the wheel G, and thereby prevents the bull-wheel from turning and the rope O from unwinding.

The special construction of the brake-wheel G is shown in Figs. 5 and 6. These figures show that the body of the brake-wheel is composed of three disks or circular planks, *r*, which are bolted to the flange or head of the bull-wheel F, and which carry near their peripheries projecting rings *s s*, all of said parts being connected with each other by proper bolts. Between the rings *s* a peripheral groove is formed, in which the brake-strap *p* is confined. The pulley-wheel *n* is not hung in the rigid or main frame A directly, but is supported by a hinged platform, P. This platform and its connections, besides being shown in Figs. 1 and 2, is more clearly represented in Figs. 7, 8, and 9. The platform P is hinged to the frame A by a hinge, *t*, which hinge allows the platform to be tilted, as in Fig. 8, for purposes hereinafter described. The hinge *t* is secured to the frame A by a vertical swiveled pin, *u*, and thus permits the platform P to be moved in a horizontal direction around

the pin *u*. The platform P, when lowered upon the supporting-frame A, as in Figs. 1 and 2, connects at its free end with a lever, Q, which is pivoted to the frame A and engages with a pin on the platform P, so that by swinging this lever the platform P may be displaced horizontally around the pin. This is done for the purpose of enabling the tools to be drawn out of the drill-hole, where but for such horizontal adjustability of the platform P the wheel *n* would be in the way of the tools when they are drawn vertically out of the drill-hole. The platform P, being hinged to the frame A, can also be used as a link in a regular pump for pumping out the drill-hole. In this case the rope M and temper-screw are disconnected from the pitman E, and the said pitman, or an elongation thereof, is pivoted, as at *v* in Fig. 8, to the platform P. The said platform P, by another pivot, *w*, or by T-iron, if desired, is connected with the plunger-rod R of the regular pump; hence, when the pitman E is reciprocated up and down the platform P will be swung on its hinge, and will alternately raise and lower the plunger-rod R, thus pumping out the drill-hole. Whenever this pumping is taking place, the lever Q must of course be disconnected from the platform P, and as a special protection against lateral displacement I put the post *x* through a hole in the platform P, said post being secured in the framing A, so that on such post the platform may be guided, and by it prevented from lateral motion.

It will be seen that all the parts of this machine can be operated from the central shaft, B, and that the multiplicity of shafts at present made use of in such drilling apparatus is entirely dispensed with. Thus the mechanism is compacted and rendered less expensive to erect and maintain, and also less bulky, and therefore more easy to transport.

It will be observed that whenever the pitman E is moved up the tool on the rope O will be dropped into the well, while when the pitman is moved down said tool will be lifted.

I believe I am the first to unite the pitman and rope M with the separate actuating-rope O.

I claim—

1. In a drilling-machine, the shaft B, combined with the sand bull-wheel F, clutch I, cam D, pitman E, rope M, pulley *n*, rope O, and temper-screw N, which connects the ropes M and O, substantially as and for the purpose herein shown and described.

2. The sand-reel C, constructed of the flanged hub *d e*, planks *f*, which are placed against the flange of the hub, and of the radial arms *g g*, which are placed against opposite sides of the planks *f* and extend beyond the outer periphery of the same, and which are notched on their inner faces down to the periphery of the planks, as set forth.

3. The platform P, carrying the guide-wheel *n* for the actuating-rope M, in combination with the hinge *t* and the upright swiv-

el *u* thereof, substantially as herein shown and described.

4. The platform *P*, carrying the guide-wheel *n* for the actuating-rope *M* of the drilling-machine, in combination with the swiveled hinge *t u* and lever *Q*, substantially as described.

5. The combination of the shaft *B* and the cam *D* with the strap *h*, pivoted plates *i*, pit-

man *E*, plates *l*, block *m*, actuating-rope *M*, and temper-screw *N*, all arranged for operation substantially as herein shown and described.

DANIEL DULL.

Witnesses:

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HARRY M. TURK.