

No. 710,098.

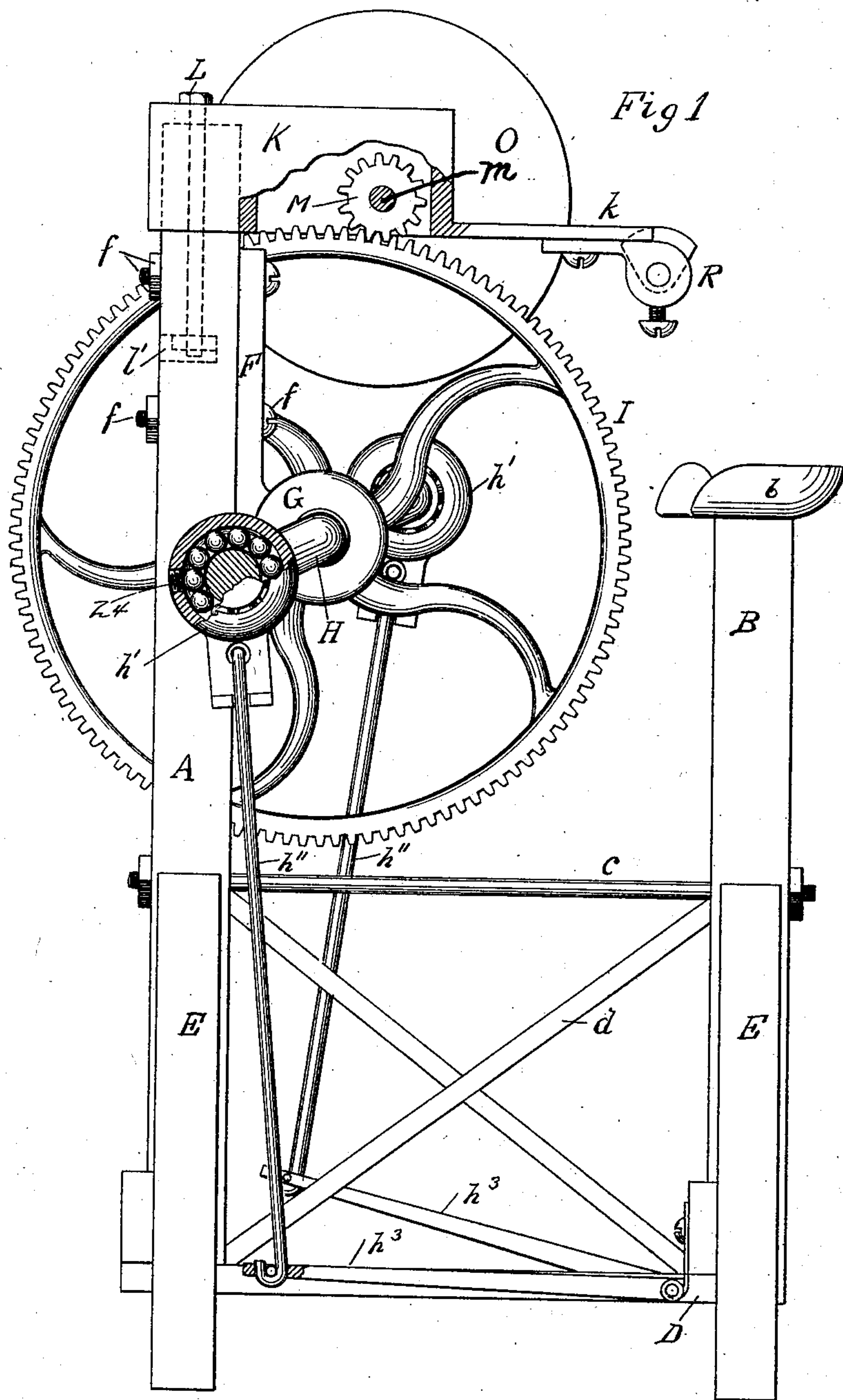
Patented Sept. 30, 1902.

N. CORNFIELD.  
EMERY GRINDER.

(Application filed Oct. 7, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses.  
Ottob. Johnson  
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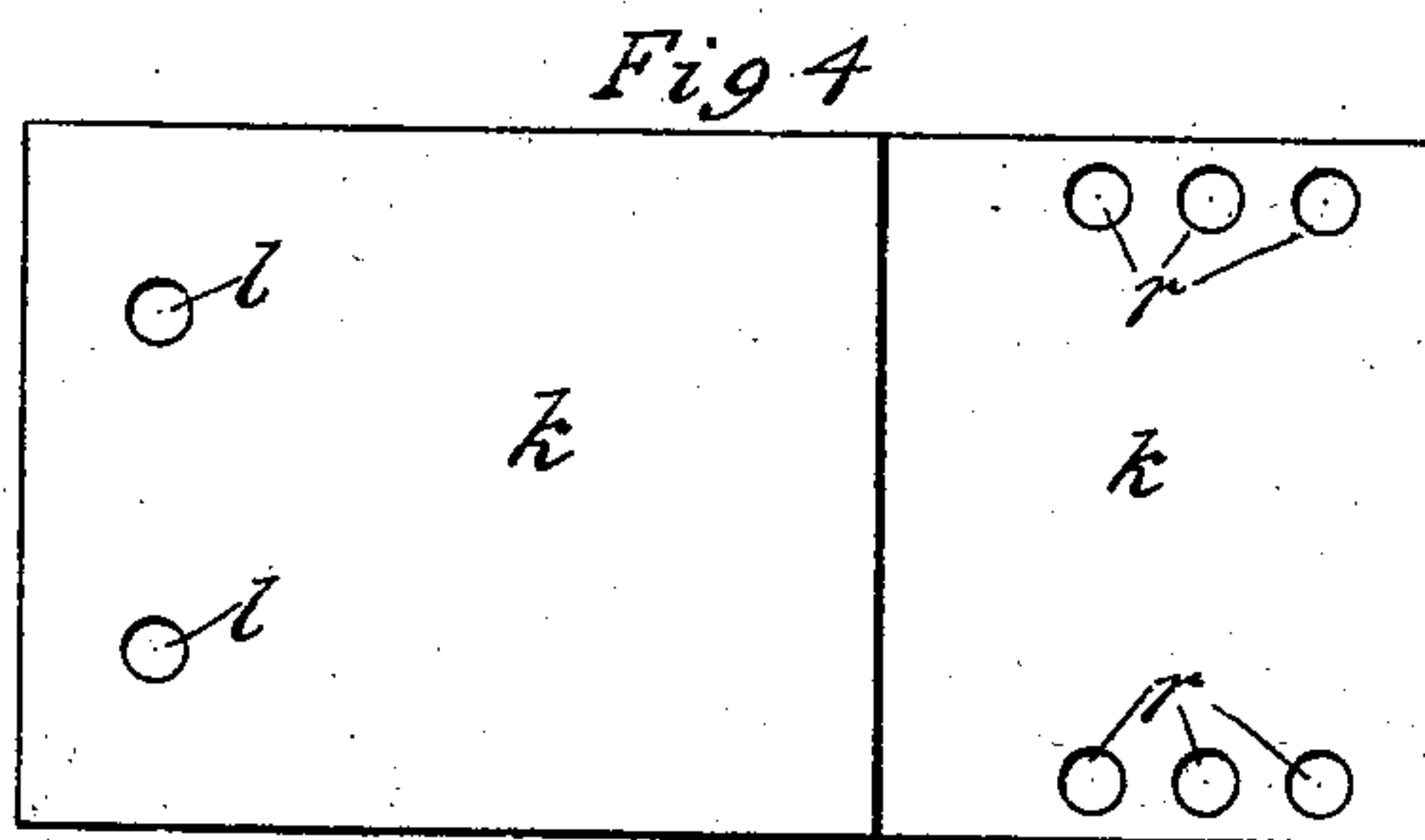
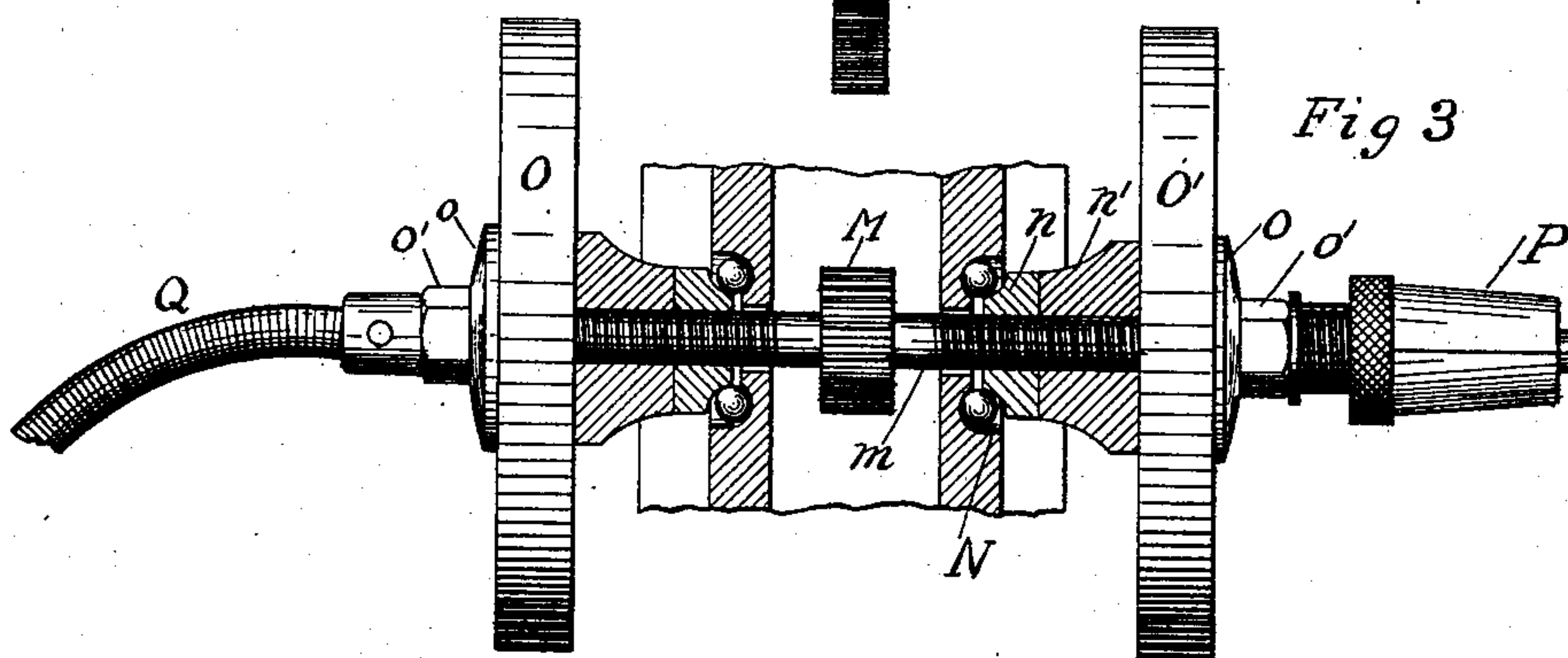
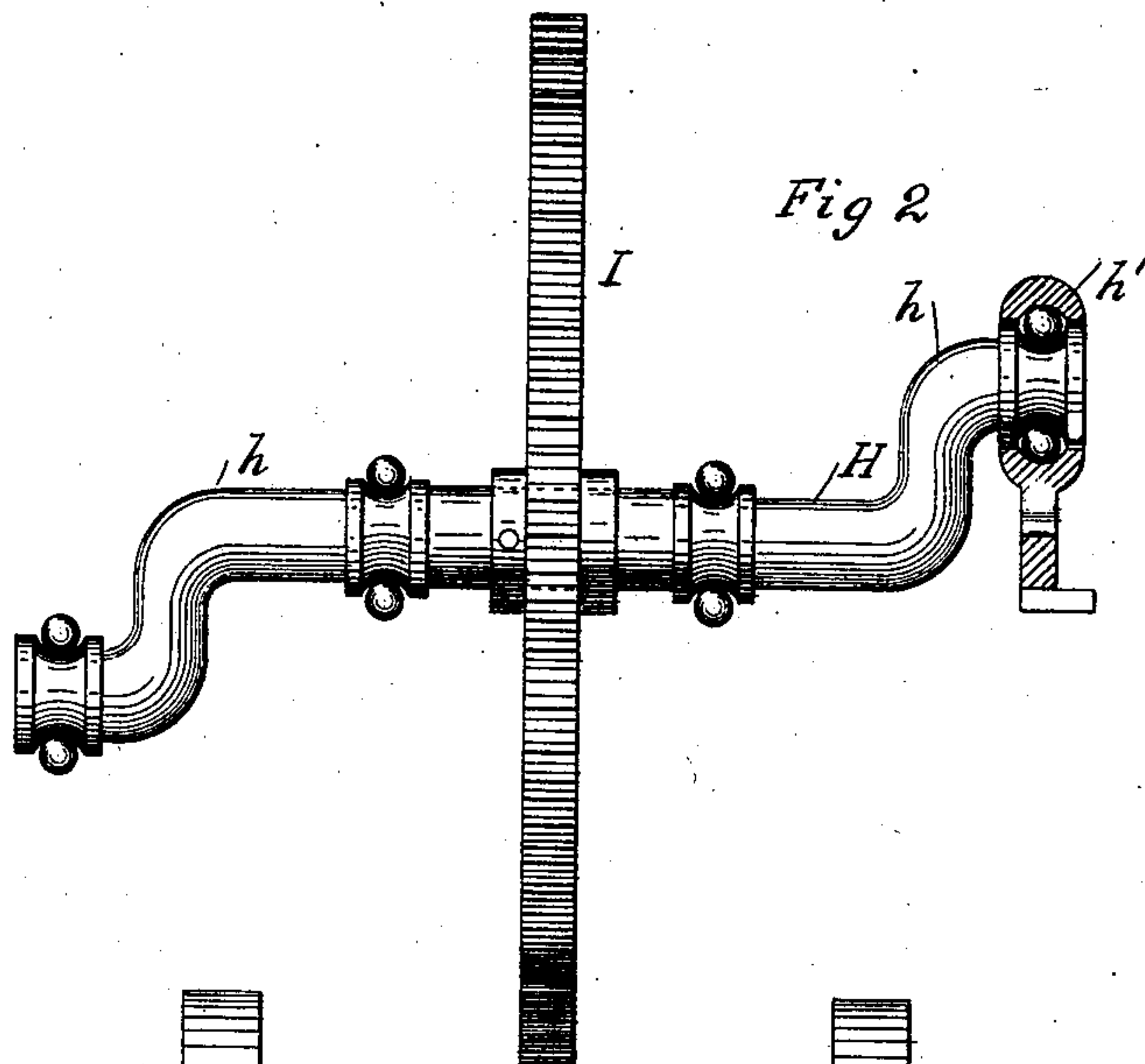
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3 Sheets—Sheet 2.



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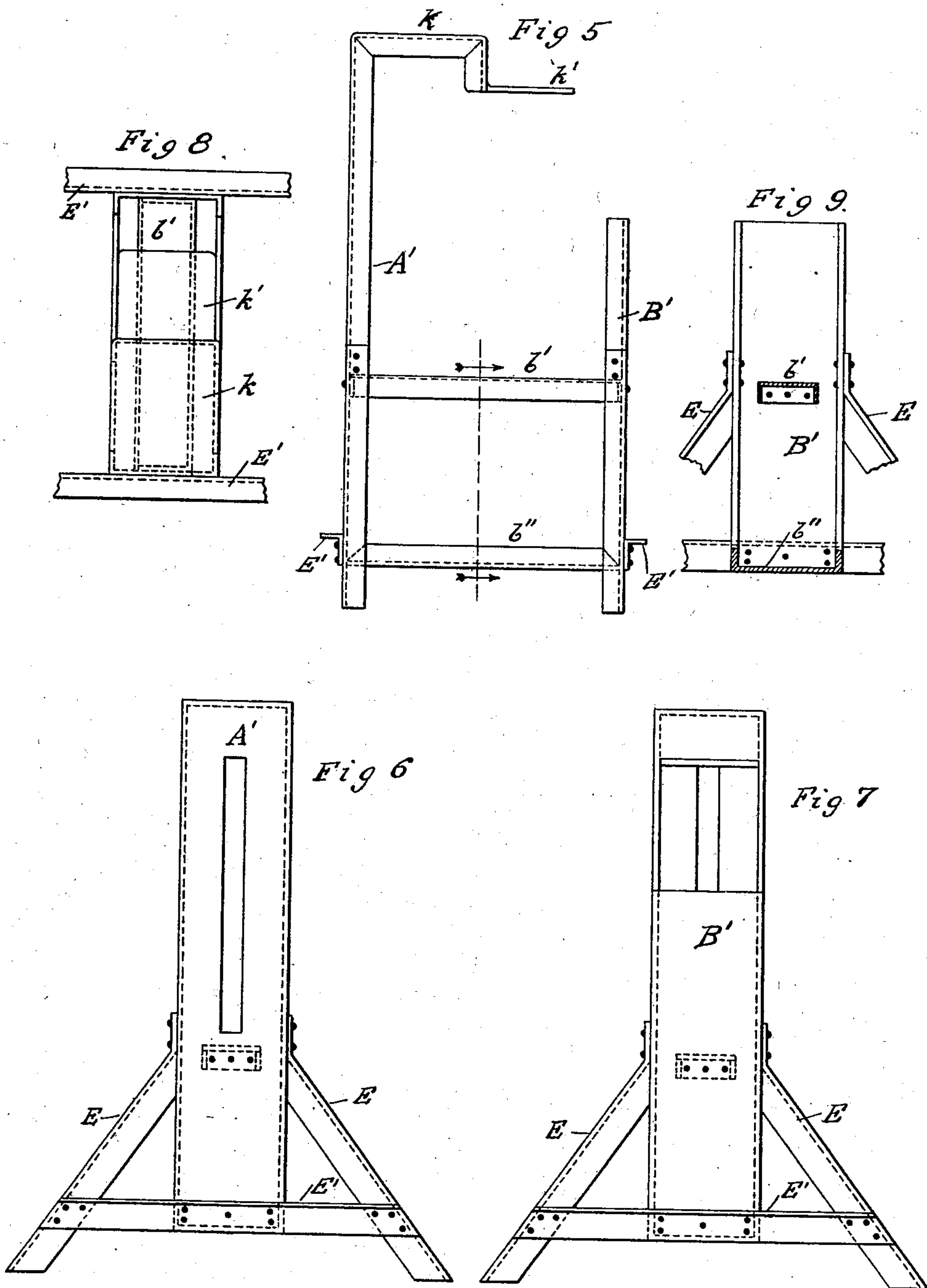
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**3 Sheets—Sheet 3.**



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# UNITED STATES PATENT OFFICE.

NOAH CORNFIELD, OF CHICAGO, ILLINOIS, ASSIGNOR TO ABRAHAM HARRIS, TRUSTEE, OF CHICAGO, ILLINOIS.

## EMERY GRINDER.

SPECIFICATION forming part of Letters Patent No. 710,098, dated September 30, 1902.

Application filed October 7, 1901. Serial No. 77,811. (No model.)

*To all whom it may concern:*

Be it known that I, NOAH CORNFIELD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Emery Grinders, of which the following is a specification.

My invention relates to machinery for mounting and driving emery grinding-wheels and tools for boring, drilling, and the like by which a very high speed and uniform motion can be given to the cutting or abrading devices with a minimum of power and loss by friction.

My invention will be described and understood by reference to the drawings, in which—

Figure 1 represents a side view of one embodiment of my invention. Fig. 2 is the main shaft with main gear attached. Fig. 3 is the pinion-shaft and pinion carrying emery or the corundum wheels, the journals and journal-gearings being shown in section, together with a portion of the gear-case, looked at from below. Fig. 4 is a top view of the gear-case and operating-table removed from the machine. An alternative construction of the framing is shown in the figures represented on Sheet 3, in which Fig. 5 is a side elevation, Fig. 6 is a rear elevation, Fig. 7 is a front elevation, Fig. 8 is a top view, and Fig. 9 is a detail view, of the seat-post, the braces and a portion of the supporting cross-beam being broken away.

Further describing my invention with reference to the drawings, in which like characters of reference denote like parts throughout, A in Fig. 1 is an upright gear-post longitudinally slotted in a manner similar to that shown at A' in Fig. 6. B is a post at the front of the machine, upon which is mounted the seat *b* to support the operator while working the pedals or using the machine. The posts A and B may be framed together in any suitable or convenient way, as by means of the bolt C, the cross-piece D and the braces *d* standing in an upright plane. The braces E, secured at their upper portion to said posts, diverge toward their lower ends and provide feet which furnish a stable foundation for the machine. Other cross-

braces E' connect the feet in pairs and between their extremities are bolted to the lower ends of the posts, which latter preferably stand off the ground. Bearing-brackets F are secured to the upright A on either side of the vertical slot therein by bolts *f*. Annular bearing-boxes G, suitably formed within to receive the antifriction-balls, are secured to said bracket or formed integrally therewith, said boxes forming a bearing for the main shaft H, to which is centrally secured in position the main gear I, so as to project through the slot in the upright A. The main shaft has cranks *h* at the extremities thereof and is preferably fitted with ball-bearings which have their casings *h'* connected by the pitman-rods *h''* to the pedals *h<sup>3</sup>*. The cranks *h* are surrounded by grooves, as best seen in Fig. 2, and the casings *h'* surround these grooves and contain the balls. The latter may be inserted into and removed from the casings through openings in their peripheries, which openings are closed by screw-plugs *h<sup>4</sup>*. A gear-box K, which may be formed of a hollow casting and preferably with a dropped table *k* integral therewith, is fitted over the end of the upright A and secured thereto by the bolts L, passing downwardly through the holes *l* and corresponding holes lengthwise of the upright. Recesses *l'* in the upright, into which a nut may be introduced, form a connection with the bolts L, by which the gear case or box K may be secured in place, so that it may not be unseated by the vibration of the machine. A pinion M is mounted on the pinion-shaft *m*, centrally thereof, so that the pinion-cogs mesh with the cogs of the main gear I. Ball-races N for antifriction-balls are formed in the material of the gear-case or may be secured thereto. The pinion-shaft is threaded from either end, and correspondingly-threaded cones *n* are screwed thereon, being followed by the block *n'*, which provides an adjustment for fit and wear. Emery-wheels O and O' are placed on the shaft *m* on either side of the table and secured in place by washers *o* and nuts *o'* or other suitable means. A chuck P for holding and centering an auger or drill may be fitted to the extremity of the shaft *m*, and provision for driving the same alternative with the



pedals may be made by attaching a flexible shaft Q or other means of communicating power to the other end of the said shaft.

The wheels O and O' may be varied in size or quality of material, as desired, and they act as fly-wheels to give a steady and uniform motion to the apparatus. In their function as fly-wheels when the machine is used for other purposes than grinding they may be replaced, either one or both, by fly-wheels of other material.

The combination gear-box and table is illustrated by a top view in Fig. 4 and also in Fig. 1, a portion of the side being broken away in the latter figure. The recessed construction provides a protection for the gearing and also provides, in connection with the bolt L, for a secure and rigid attachment to the upright A. A tool-rest R may be attached thereto, as shown in Fig. 1, the openings *r r* in Fig. 4 providing means therefor.

An alternative form of constructing the supporting-framework for my device is shown on Sheet 3, in which the uprights A' and B' are represented as made of channel-iron, the former being bent and shaped at its upper extremity to form the gear-box *k'* and dropped table *k*. The said uprights are secured together by channel-strips *b'* and *b''*, and means for steadying the complete machine on the floor is provided by the legs E and the cross-pieces E'.

My invention as illustrated by the practical and operative example shown provides an effective means of communicating high power and speed to rotary cutters of all kinds. I have illustrated it with reference to mounting thereon abrasive wheels, as of emery, corundum, and the like. I do not limit myself to the particular forms or uses illustrated; but

I claim, and desire to secure by Letters Patent, the following:

1. In an emery grinder, the combination with a frame comprising a gear-post and seat-post with a seat thereon; of a main gear and gear-case mounted on the gear-post, driving mechanism therefor, and a pinion mounted on the gear-case, substantially as set forth.

2. In an emery grinder, a frame comprising a gear-post, seat-post, means for securing the same together and a pedal attached to the frame; combined with a main gear and crank-shaft on the gear-post, a pitman-rod connecting the pedal to the crank-shaft, a gear-case attached to the gear-post and a pinion mounted on the gear-case, substantially as set forth.

3. In an emery grinder, a frame comprising a gear-post, seat-post, means for securing the same together, and a pedal attached to the frame; combined with a main gear and crank-shaft on the gear-post, a pitman-rod connecting the pedal to the crank-shaft, a gear-case attached to the gear-post, a pinion mounted on the gear-case, an abrasive wheel on the pinion-shaft, and an operating-table carried by said case, substantially as set forth.

4. In an emery grinder, a gear-post, and a main gear, combined with a gear-case and operating-table; said gear-case adapted to fit over and be framed to the gear-post and having the operating-table extended horizontally therefrom, substantially as set forth.

5. In an emery grinder, a gear-post, and a main gear, combined with a gear-case and operating-table; said gear-case adapted to be supported by the gear-post and having an integrally-formed operating-table extended horizontally therefrom, substantially as set forth.

6. A frame for an emery grinder comprising a seat-post and gear-post, means for securing the same together and supporting them in their normal positions, and a gear-case and operating-table formed integrally with each other and supported by the gear-post, substantially as set forth.

7. A frame for emery grinders comprising a seat-post and a gear-post, the latter having upright holes in its upper end and side recesses intersecting said holes near their lower extremities, and a driving-gear journaled on said gear-post; combined with a gear-case fitting over the upper end of the gear-post, an emery-carrying shaft journaled therein, a pinion on the shaft meshing with the driving-gear, bolts passing downward through said case into the holes of the post, and nuts on the bolts within the recesses of the post.

8. In an emery grinder, the combination with the seat-post and gear-post, and braces connecting them and standing in an upright plane; of the driving-shaft supported in bearings on the gear-post and having two cranks, a driving-wheel between them, a driven mechanism connected with said wheel, two treadles hinged to the frame, and pitman-rods connecting the treadles with the cranks, one treadle and its pitman-rod on either side of said braces.

9. In an emery grinder, the combination with the seat-post and gear-post, braces connecting them and standing in an upright plane, legs secured at their upper ends to the sides of both said posts with their bodies leading obliquely downward and outward, and cross-braces connecting said feet and secured between their ends to the lower ends of the posts; of the driving-shaft supported in bearings on the gear-post and having two cranks, a driving-wheel between them, a driven mechanism connected with said wheel, two treadles hinged to the frame, and pitman-rods connecting the treadles with the cranks, one treadle and its pitman-rod on either side of said braces.

10. In a machine of the character described, the combination with the two posts connected by braces in an upright plane, a driving-shaft mounted in bearings on one post and having oppositely-disposed grooved cranks, ball-cases surrounding said cranks, and series of balls therein; of two treadles hinged to the opposite post, and two pitman-rods each con-



necting a treadle with a casing, each treadle and rod standing to one side of said braces.

11. In a machine of the character described, the combination with the driven shaft and  
5 mechanism, the driving-shaft having cranks, the driving-wheel between said cranks and connected with the driven shaft, and an upright post having bearings for said driving-shaft and a slot for said driving-wheel; of  
10 ball-bearings mounted within casings on said cranks, two treadles, and pitman-rods connecting the treadles with the casings respectively.

12. The combination of a crank-shaft, with a hinged treadle, a pitman-rod pivoted at one  
15 end to the treadle, and a ball-bearing between its other end and the crank, substantially as described.

In witness whereof I have hereunto set my hand, at Chicago, in the State of Illinois, this  
20 5th day of October, 1901.

NOAH CORNFELD.

Witnesses:

C. K. CHAMBERLAIN,  
A. S. PHILLIPS.