No. 621,113. Patented Mar. 14, 1899.

J. F. LOMPREY.

BORING MACHINE.

(Application filed Feb. 14, 1898.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

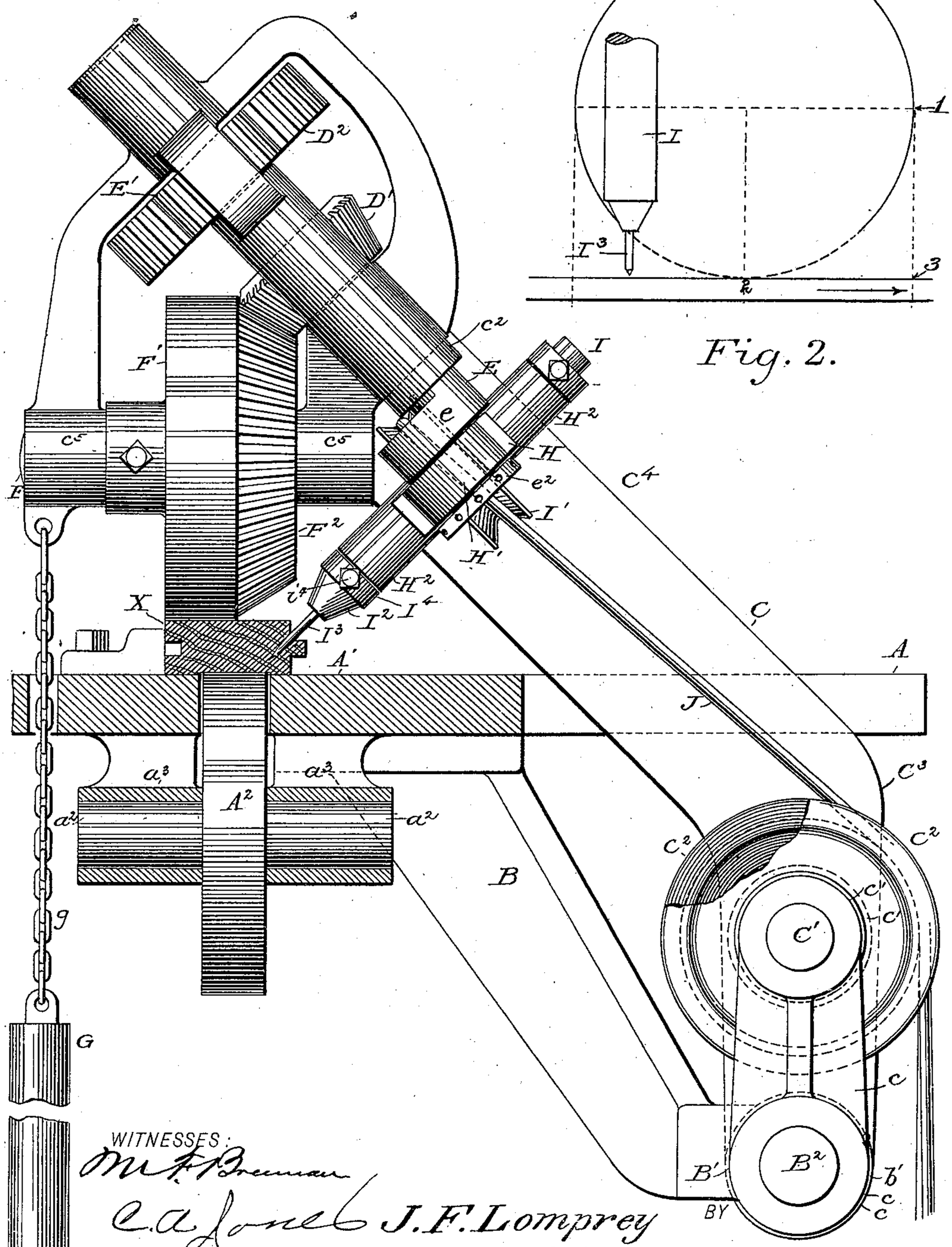

Fig. 2.

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Fig. 3.

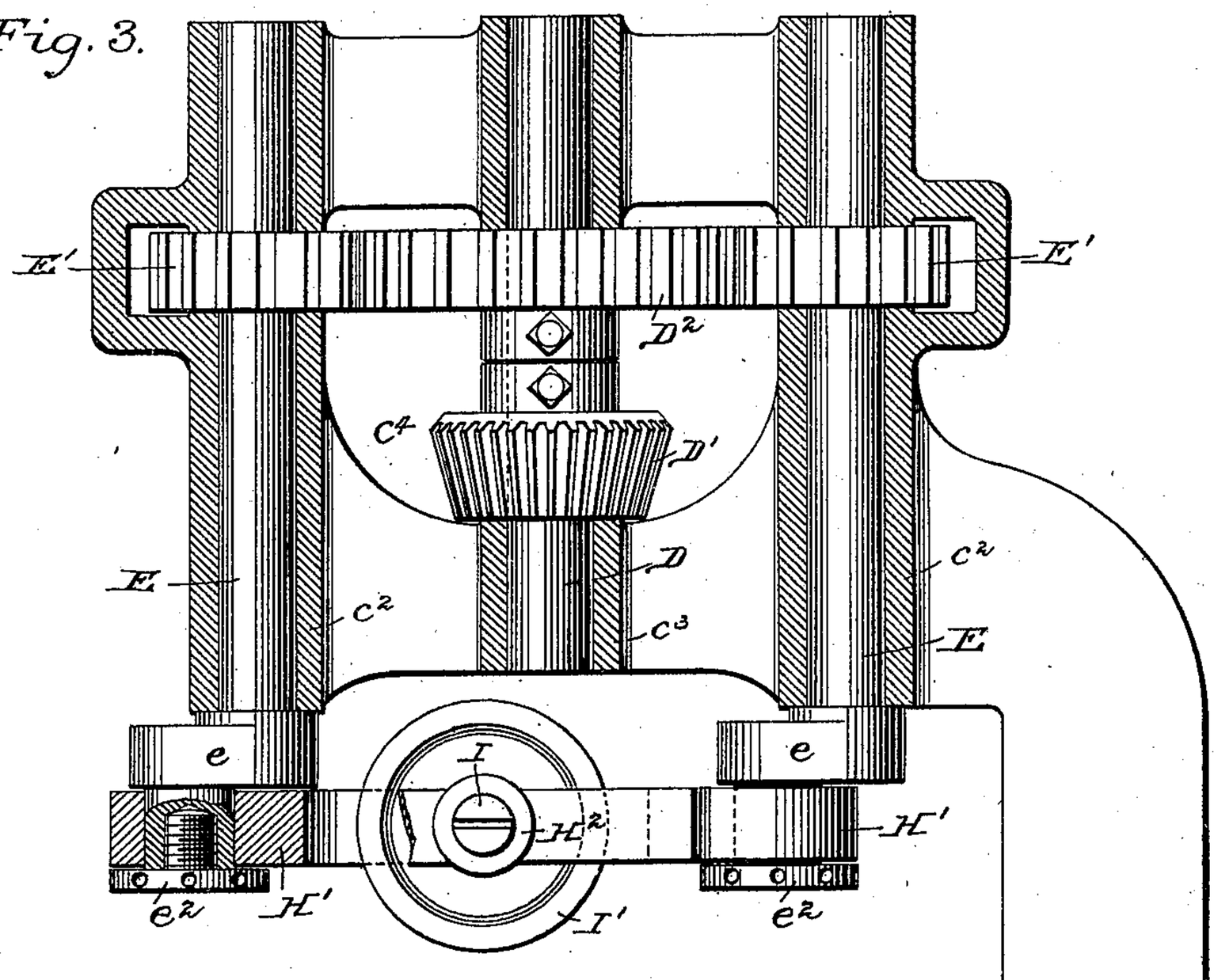

Fig. 4

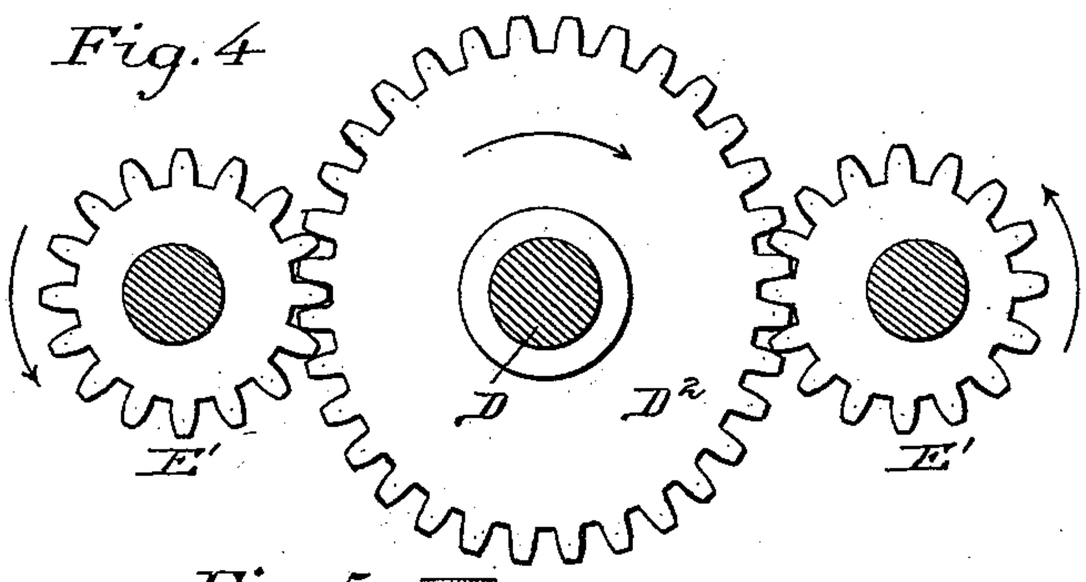

Fig. 5

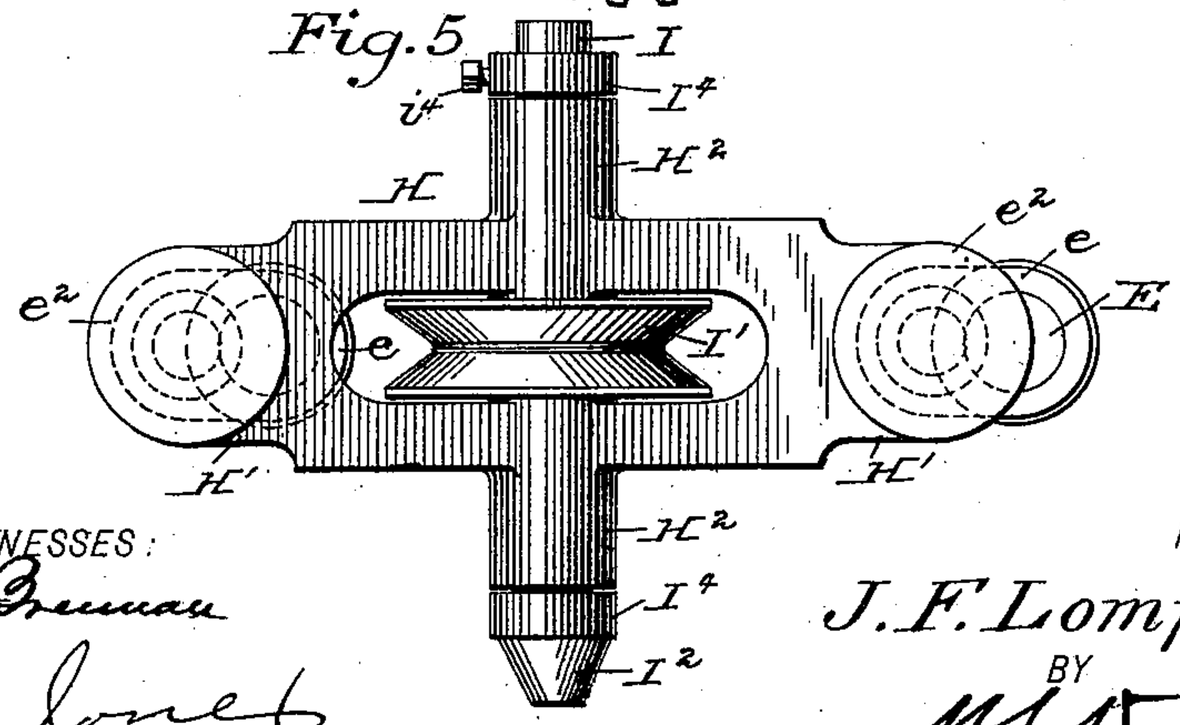

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Fig. 6.

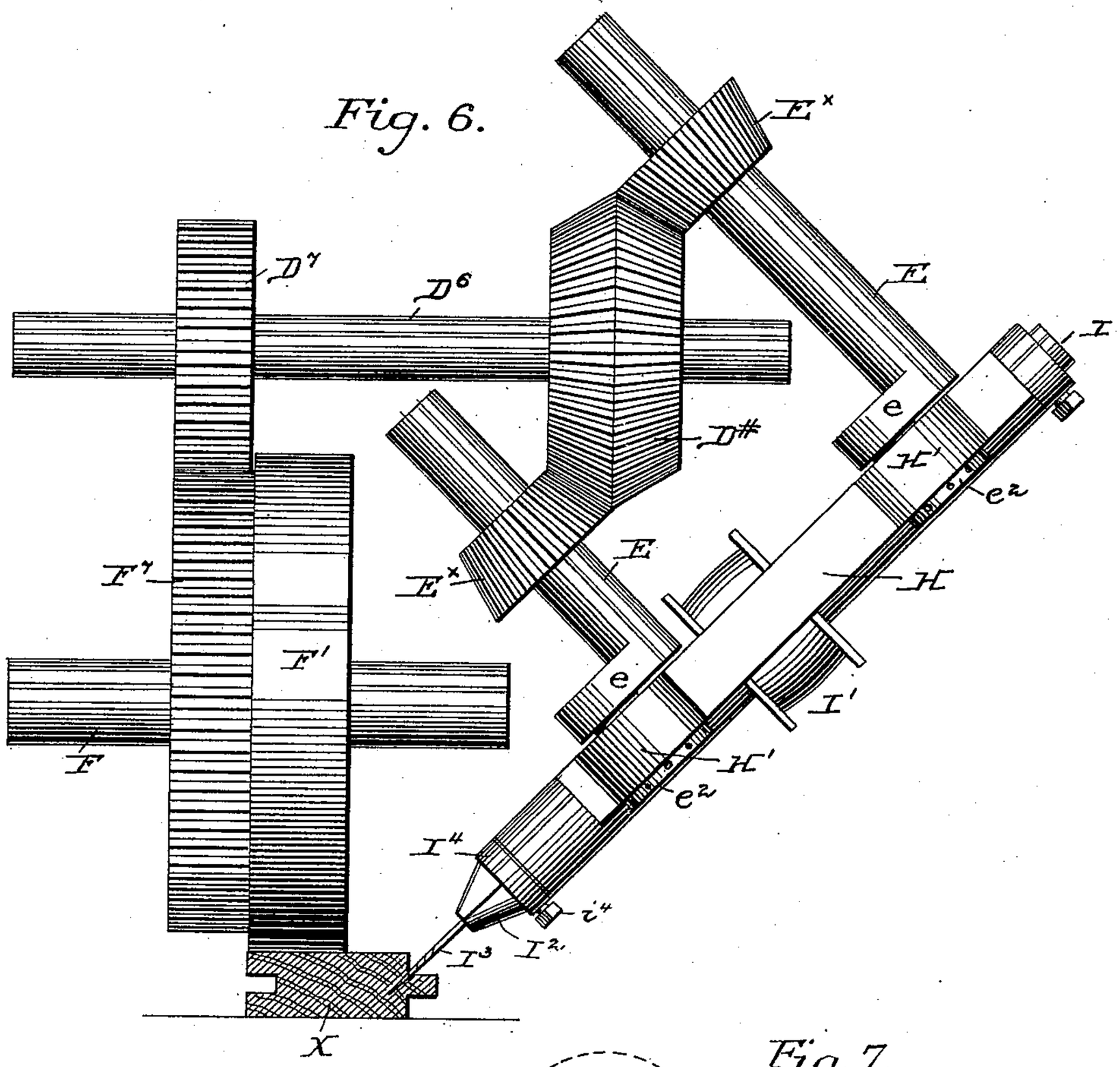
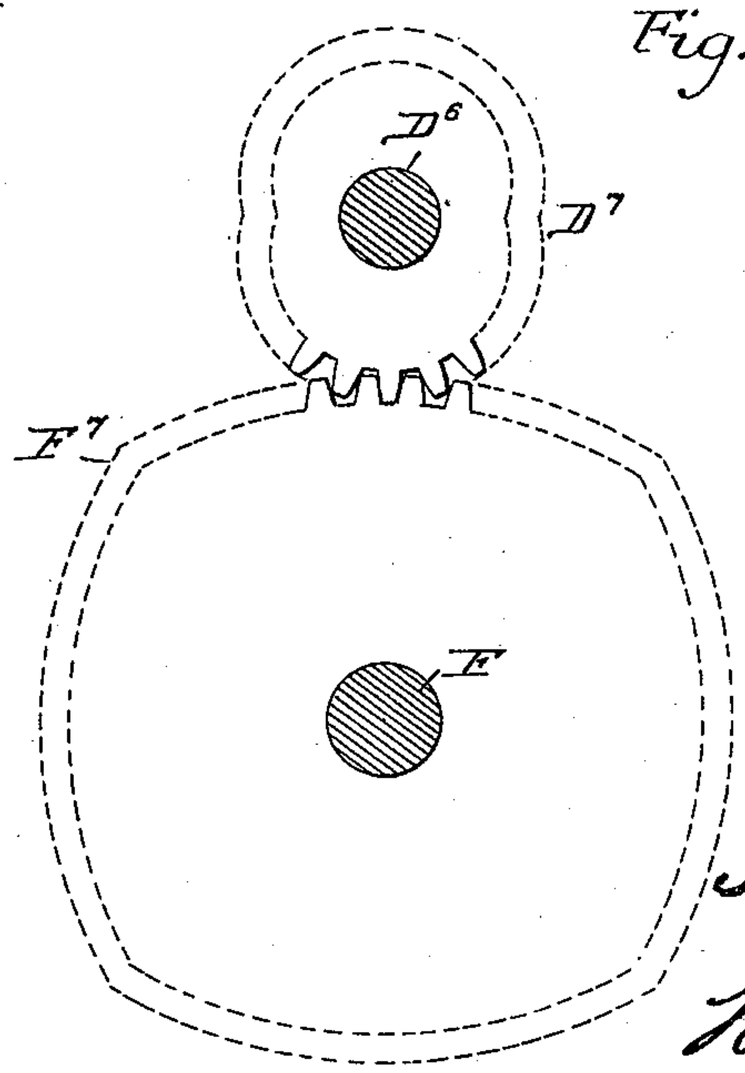


Fig. 7.



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UNITED STATES PATENT OFFICE.

JERRY F. LOMPREY, OF PETOSKEY, MICHIGAN.

BORING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 621,113, dated March 14, 1899.

Application filed February 14, 1898. Serial No. 670,253. (No model.)

To all whom it may concern:

Be it known that I, JERRY F. LOMPREY, a citizen of the United States, residing at Petoskey, in the county of Emmet and State of Michigan, have invented certain new and useful Improvements in Boring-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.

My invention relates to that class of machines which are used for boring nail-holes in boards while the stock is in motion.

The objects of the invention are to provide a novel and effective gearing for operating the crank-shafts which carry the drill-carrier; to construct such gearing of an irregular gear driven by the flooring-board through intermediate gearing, so that the spindle-holder carrying the drill-spindle in a circular motion will conform to the exact motion of the board moving in a straight line, and to provide a vertically and outwardly swinging frame which carries the boring mechanism and the operating friction-wheel, so that the said wheel will be pressed down on the upper side of the boards when the frame is swung into its operative position thereover and serve also as the presser-wheel therefor, and, on the other hand, should a board break under the boring-machine the swinging frame and mechanism carried thereby may be automatically swung from over the same.

With these and other objects in view my invention consists in certain features of construction hereinafter specified, and particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a side elevation of a boring-machine embodying my invention, the same being shown applied to the end of a matching-machine. Fig. 2 is a diagrammatic view illustrating the relative travel of the drill and stock. Fig. 3 is a sectional view of the head of the machine; Fig. 4, details in elevation of the drill-shifting gears. Fig. 5 is a front elevation of the drill-carrier and its support. Figs. 6 and 7 illustrate modifications hereinafter referred to.

Like letters and numerals of reference indicate like parts in all the figures of the drawings.

A represents the end portion of a flooring or matching machine to which my improved boring-machine is shown as applied, though the latter may be made and operated as a separate or independent machine, if desired, and A′ is the table or bed along which the flooring-boards X pass over a supporting-wheel A^2, projecting up through a slot in the table. The supporting-wheel A^2 has its shaft or trunnions a^2 mounted in bearings a^3, secured to the under side of the table.

B is a bracket bolted to the flooring-machine frame or other support and provided with bearings B′ B′, supporting a shaft or pin B^2 below the table and to one side of the path of the floor-boards.

C is the vertically and downwardly swinging frame which carries all of the boring mechanism, and this frame is provided at its lower angular end C^3 with bearings *c c*, mounted on the shaft or pin B^2. In vertical alinement with the bearings *c c* are other bearings *c′ c′*, which support a shaft C′, carrying the idler-pulleys C^2 C^2.

From the upper end of the part C^3 the frame C extends upwardly and inwardly over the table in the form of an inclined arm C^4, the upper end of which projects laterally and is provided with parallel longitudinally-extending bearings c^2 c^2 and c^3, which bearings are intersected by an opening c^4. In the middle bearing c^2 is journaled a shaft D, provided with a beveled driving-gear D′ and an elliptical transmitting-gear D^2, which for convenience and as a generic term I will denominate an "irregular" gear.

E E are parallel crank-shafts mounted in the bearings c^2 c^2, their lower ends carrying the wrist-pins or eccentrics *e e*, provided with threaded holes, while thereto are secured the eccentric gears E′ E′, which mesh with the irregular gear D^2, by which they are driven to rotate the shafts E E.

Directly below the bearings c^3 the frame C is provided with horizontally-alined bearings c^5 c^5, in which is mounted a shaft F, extending parallel with the shaft a^2 of the supporting-wheel A^2. On the shaft F is mounted the combined gear and friction drive-wheel F′, which rests on the board X, directly over the supporting-wheel A^2, to hold the board down and be in turn rotated thereby as the board travels along. The inner side of the wheel F

is provided with a bevel-gear F^2, which meshes with the bevel-gear D′, which, through gearing D^2 E′ E′, rotates the crank-shafts E E. If greater weight than that of the frame C and parts carried thereby is required, a weight G may be suspended by a chain *g* from the upper free end of the frame, as shown in Fig. 1.

H is the inclined drill-spindle carrier, in the form of a rectangular open body, provided on its vertical sides with boxes H′ H′, mounted on the wrist-pins *e e*, to which they are secured by the headed screws e^2 e^2. The upper and lower portions of the carrier H are provided with alined bearings H^2 H^2, in which is mounted the drill and spindle I, which is provided with a suitable drive-pulley I′ within the open portion of the carrier H. The lower end of the drill-spindle is provided with a suitable drill-socket I^2, in which the drill I^3 is held. The drill-spindle I is held in its bearings H^2 by a collar I^4, having a set-screw i^4. The drill-spindle I extends downwardly and outwardly toward the lower portion of the wheel F′, so that the drill will bore an oblique hole in the adjacent tongue edge of the flooring-board.

The pulley I′ is driven by a belt J from any suitable drive-pulley (not shown) over idlers C^2 to and around said pulley I′.

It will be seen from the foregoing that the moving board X rotates the friction-wheel F′ and gear F^2, which latter, through gearing D′, D^2, and E′, causes the rotation of the shafts E, the cranks *e* of which carry the drill-carrier H, which will therefore have a longitudinal movement with the board, as well as motion toward and from the board. It is necessary to impart to the drill a movement that will be identical with that of the board while the drill is in contact with the stock, and this is effected by the elliptical gear D^2 and eccentric gears E′ E′. To better illustrate this, referring to Fig. 2, the distance from 1 to 2 (the travel of the drill) is greater than the distance from 3 to 2, (the travel of the board.) It is therefore necessary that the drill travel faster than the board to accomplish the greater distance in the same time that the board travels the lesser. The motion of the drill is faster as it approaches the board and gradually decreases until it reaches its greatest depth at the point indicated as 2, and again gradually increases as the drill recedes from the board. The gear D^2 being irregular yet travels regularly and imparts, through the eccentric gears E′ E′, irregular motion to the cranks *e e*, thus carrying the drill-spindle with the board.

Referring now to Figs. 6 and 7, it will be seen that the same results and operations are attained by a modified mechanism. The swinging frame C is omitted to more clearly show the shafting and gearing carried thereby. The crank-shafts E E in this construction lie in the same vertical plane, and their cranks *e* carry the drill-carrier H, in which is mounted drill-spindle I, having drive-pulley I′. The bevel-gears $E^\times$ on crank-shafts E mesh with the respective halves of a double bevel-gear $D^\times$, mounted on the shaft D^6, which corresponds in function to the shaft D in Figs. 1 and 3 and is provided with an elliptical gear D^7, meshing into an irregular gear F^7, carried by the wheel F′ on the shaft F. Thus while the location of the irregular gears is different from that of the gearing D^2 E′ E′, yet the function is the same and the mode of operation is substantially so. The relative movement of the drill to that of the board will be perfect and the same as that described in the preferred form. (Shown in Figs. 1 to 5.)

Although I have herein illustrated and described two modes of construction and arrangement of the details composing my invention, yet it will be obvious that others will readily suggest themselves. I therefore would have it understood that I do not limit my invention to the particular construction herein shown and described, but hold that I may vary the details and arrangement thereof in any manner and to any extent within the scope of my invention.

Having thus fully described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. The combination with the parallel crank-shafts and the drill-spindle carrier operated thereby, of irregular gearing for operating said crank-shafts, and means for operating said gearing.

2. The combination with the parallel crank-shafts, and the drill-spindle carrier operated thereby, of a drive-wheel operated by the traveling boards, and irregular gearing, substantially as described connecting said drive-wheel with the said crank-shafts.

3. The combination with the parallel crank-shafts, the drill-spindle carrier operated thereby, eccentric gears on said crank-shafts, and an intermediate shaft provided with an irregular gear meshing with said eccentric gears, of a drive-wheel operated from the traveling board and geared to said intermediate shaft.

4. The combination with the parallel crank-shafts having eccentric gears, an intermediate shaft provided with an irregular or elliptical gear meshing with said eccentric gears, and a drill-spindle carrier mounted on the crank-shaft wrist-pins, of a drive-wheel in the path of the boards for operation thereby, a bevel-gear turning with said drive-wheel and meshing with a bevel-gear on said intermediate shaft.

5. The combination with a swinging frame overhanging at its upper end the path of the boards, of a combined drive and presser wheel journaled in said frame, parallel crank-shafts having a drill and spindle carrier mounted on their wrist-pins, a drill-spindle mounted in the carrier and provided with means for rotating it, gears on the upper portions of said crank-shafts, an intermediate shaft having a gear meshing with the gears on the crank-shaft, and gears connecting said intermediate shaft with the drive and presser wheel.

6. The combination with the bed or table to support the moving boards, of an inclined frame pivoted at its lower end and extending at its upper end over the said table, a combined drive and presser wheel journaled in the free end of the frame for operation by the traveling boards, crank-shafts journaled in said frame at an angle to the axis of said drive-wheel and provided at their upper ends with gear-wheels, an intermediate parallel shaft having a gear meshing with the crank-shaft gears and also geared to the said drive and presser wheel, a drill-spindle carrier on the lower cranked ends of said crank-shafts, a drill-spindle journaled in said carrier at right angles to said crank-shafts, a pulley on said spindle, and idle-pulleys also journaled on the swinging frame to guide a belt to said pulley.

7. The combination with the bed or table to support the moving boards, of a frame pivoted at its lower end and at its upper end overhanging said bed or table, a combined drive and presser wheel mounted on the free end of said frame, crank-shafts also on the frame, irregular gearing, substantially as described, connecting said crank-shafts with said drive and presser wheel, and a drill-spindle carrier mounted on the lower cranked ends of said shafts, and provided with an inclined drill-spindle the lower end of which extends toward the lower side of the drive and presser wheel.

8. The combination with the vertically-swinging frame pivoted at its lower end and having a combined drive and presser wheel journaled in its free end, of parallel crank-shafts journaled in said frame above and at an angle to said wheel, eccentric gears on the upper ends of said crank-shafts, an intermediate shaft provided with an irregular gear meshing with said eccentric gears and provided with a bevel-gear meshing with a similar gear turning with the drive and presser wheel, a drill-spindle carrier on the lower cranked ends of the shafts, and a drill-spindle mounted on the carrier and provided with means for rotating it.

JERRY F. LOMPREY.

Witnesses:
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S. C. SMITH.