

(No Model.)

A. J. MARTIN & L. HEATH.
CHANGEABLE SPEED GEARING.

No. 432,418.

Patented July 15, 1890.

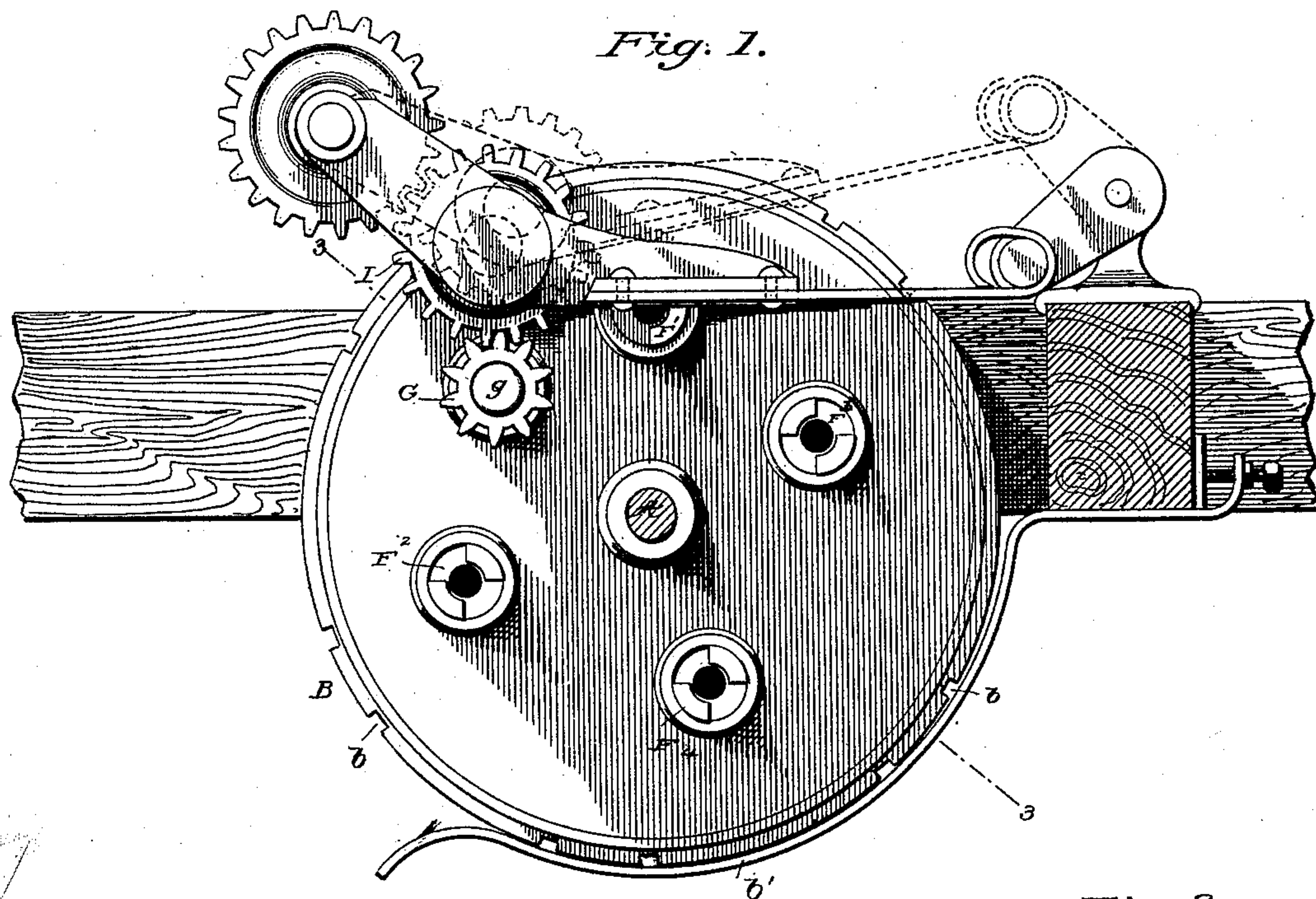


Fig. 2.

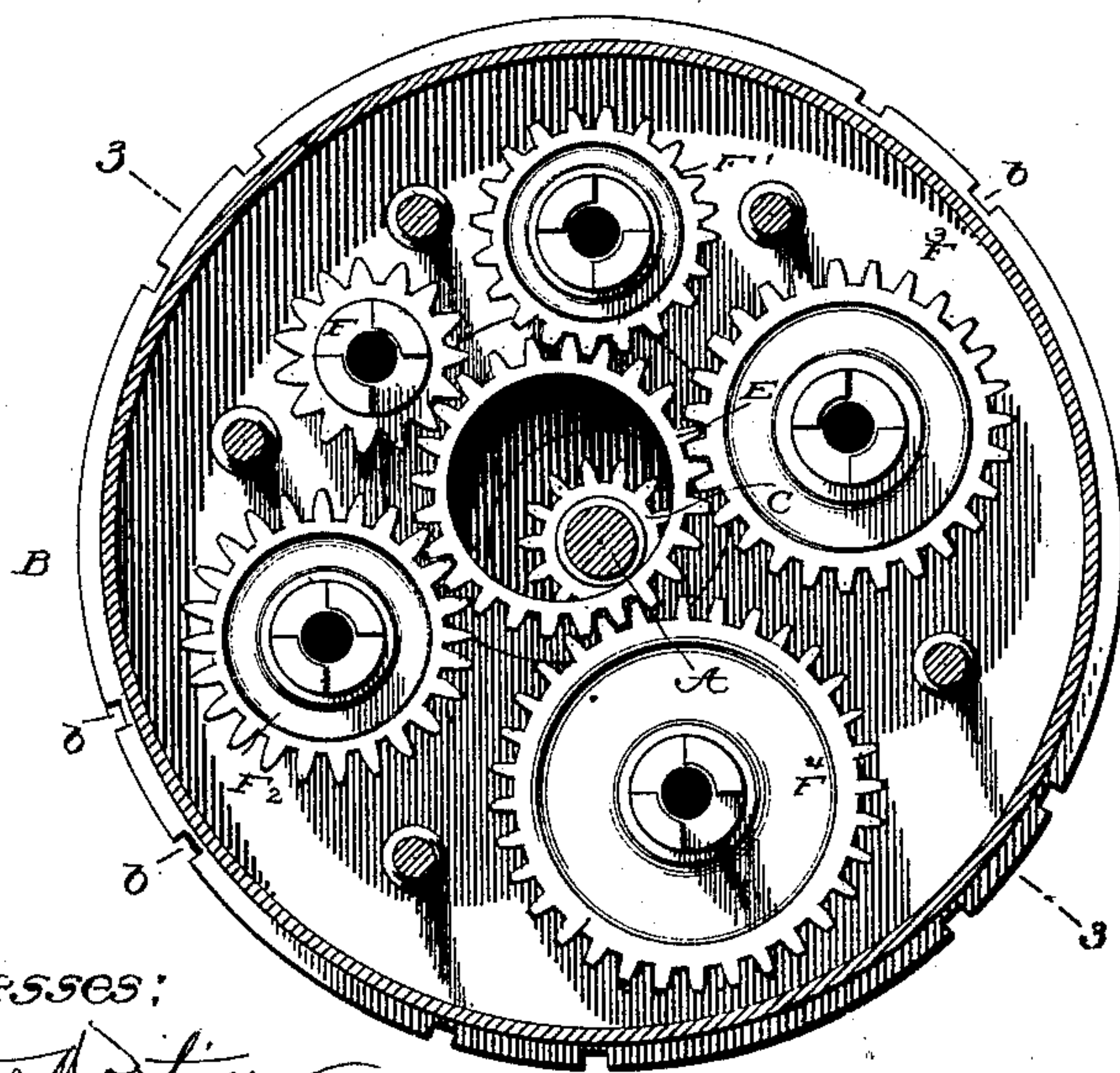
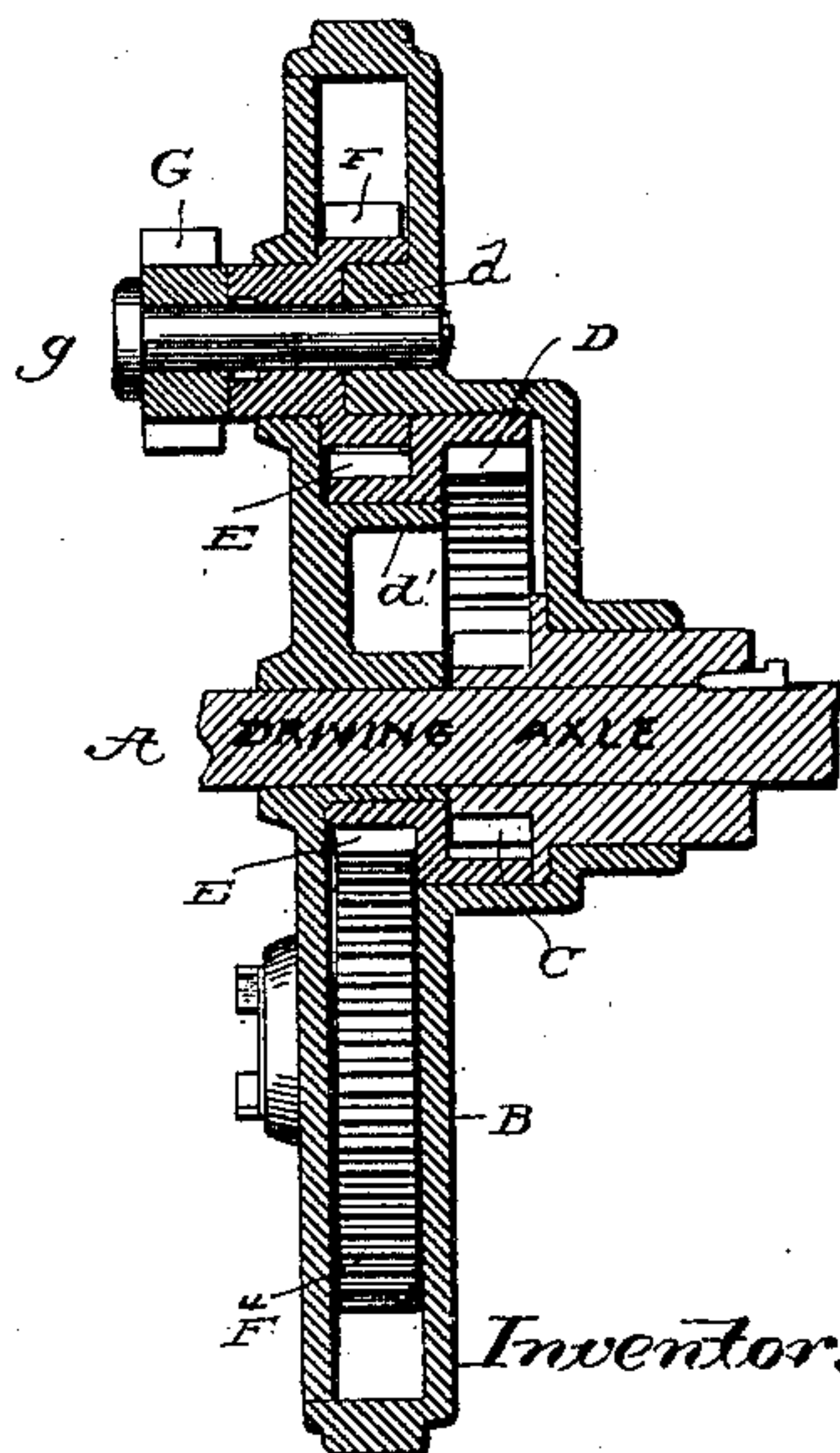


Fig. 3.
on line 3-3



Witnesses:

W. W. Martin.
A. R. Kennedy.

Inventor:

A. J. Martin.
Laurance Heath.
By Phil T. Dodge, Atty.

UNITED STATES PATENT OFFICE.

ANDREW J. MARTIN AND LAWRENCE HEATH, OF MACEDON, NEW YORK,
ASSIGNORS TO BICKFORD & HUFFMAN, OF SAME PLACE.

CHANGEABLE-SPEED GEARING.

SPECIFICATION forming part of Letters Patent No. 432,418, dated July 15, 1890.

Application filed May 20, 1890. Serial No. 352,544. (No model.)

To all whom it may concern:

Be it known that we, ANDREW J. MARTIN and LAWRENCE HEATH, of Macedon, in the county of Wayne and State of New York, have
5 invented certain Improvements in Changeable-Speed Gearing, of which the following is a specification.

Our invention relates to an adjustable gearing by which various speeds may be transmitted to a driven pinion from a pinion having a constant rate of speed. It has reference more particularly to that type of gearing which is represented in Letters Patent of the United States granted to Albert Armitage
15 July 6, 1886, No. 345,018, and to Kirkpatrick and Martin, February 15, 1887, No. 357,834.

The principal object of the invention is to secure a very slow motion of the driven pinion when required; and to this end it consists
20 in combining with the main driving-pinion and the series of pinions of different diameters grouped around the same and mounted in a revoluble support, so that either one of said pinions may be brought into operative
25 position, as heretofore, an internal gear and a pinion acting therein as the prime mover.

In the accompanying drawings, Figure 1 is a side elevation of our improved gear mechanism as it appears when applied to the frame
30 of a grain-drill, for which it is mainly intended. Fig. 2 is a side view of the gear-train, the side of the casing being removed to expose the internal parts. Fig. 3 is a cross-section on the line 3 3 of Figs. 1 and 2.

Referring to the drawings, A represents the central driving shaft or axle, which may be mounted in fixed bearings of any suitable character. When used in a grain-drill, the main ground-wheels are usually attached directly to this axle to drive the same.
40

B represents a hollow disk-like casing mounted to rotate around the axle and provided at its outer edge with a series of notches *b*, adapted to be engaged by a projection on the spring-latch *b'*, fixed to the main frame or other support, so that the casing may be revolved at will to bring one or another of these pinions into action, as hereinafter explained, and locked in the required position
50 by the latch. This casing, it is to be under-

stood, stands normally at rest. Within the casing, fixed rigidly on the axle, is a pinion C, which engages an internally-toothed gear or ring D, mounted to revolve in a seat or cavity on one side of the casing B. It will be
55 observed that this internal gear D is eccentric to the driving-pinion C, by which it is constantly rotated at a relatively low speed. The internal gear D is formed integral with or attached firmly to the side of a spur-pin-
60 ion E, located within the casing B, and engaging a series of pinions *F F' F''*, &c., which are of different diameters, so that they are rotated in different times. The entire series
65 of pinions *F F'*, &c., are mounted on journals in the casing B, and are permanently engaged with the driving-pinion E, so that they are all driven constantly thereby, although but one at a time is in use. Each of the pinions
70 has its journal extended or exposed through one side of the casing, in order to receive an external pinion G, which is applied to that particular inside pinion which is for the time being in use. The manner of connecting this
75 pinion G with the inside pinion is not of the essence of our invention. The two parts may have hubs arranged to interlock, as shown in the drawings, combined with a central pin *g*, to maintain their action, or they may be otherwise constructed.
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In a suitable bearing on the frame of the machine we mount a pinion I to communicate motion to the seed mechanism or other mechanism to be finally driven. By revolving the gear casing or shell B the external pinion G,
85 when applied to either one of the internal pinions, may be brought into engagement with the fixed pinion I.

The operation is as follows: A rotary motion being imparted from any suitable source
90 to the shaft A, the pinion C is revolved therewith and imparts in turn a constant but slower rotation to the internal gear D and its attached pinion E. The pinion E in turn communicates motion to the pinions *F F'*, &c.
95 One of the last-named pinions is connected for the time being with the external pinion G, which in turn communicates motion to the final pinion I. Such of the pinions *F F'*, &c., as are not connected to the pinion G re-
100

volve idly on their bearings, but perform no labor and are subject to no material wear or friction. As the respective pinions F F' F², &c., revolve at different rates of speed, it follows that the final pinion I is driven at a higher or lower rate of speed, according as the pinion G is connected to one or another of the internal pinions. We prefer to sustain the internal pinions F F', &c., by means of studs or journals *a*, formed on the inner wall of the case, to sustain the spur-pinion E on a stud *a'* on the opposite wall of the case, and to give the pinion C a peripheral bearing within the case, as shown; but it is to be understood that their pivotal supports may be of any suitable form and arrangement, provided the parts occupy the relations herein described and are adapted to receive the adjustments set forth.

Having thus described our invention, what we claim is—

1. In combination with the rotatable casing, the variant pinions mounted therein, the center pinion with which they engage, the internal gear attached to the center pinion, and the primary driving-pinion engaging the internal gear.

2. The driving-shaft and its pinion and the shell or casing mounted to revolve around said shaft, in combination with the variant pinions mounted therein, and a pinion engaging all the variant pinions and driven by an intermediate gear from the pinion on the main shaft.

In testimony whereof we have hereunto set our hands, this 1st day of May, 1890, in the presence of two attesting witnesses.

ANDREW J. MARTIN.
LAWRENCE HEATH.

Witnesses:

W. L. ACKER,
G. W. KIRKPATRICK.