(No Model.) 2 Sheets—Sheet 1.

E. F. AUTENRIETH.

MECHANICAL MOVEMENT.

No. 398,214. Patented Feb. 19, 1889.

Fig. 1

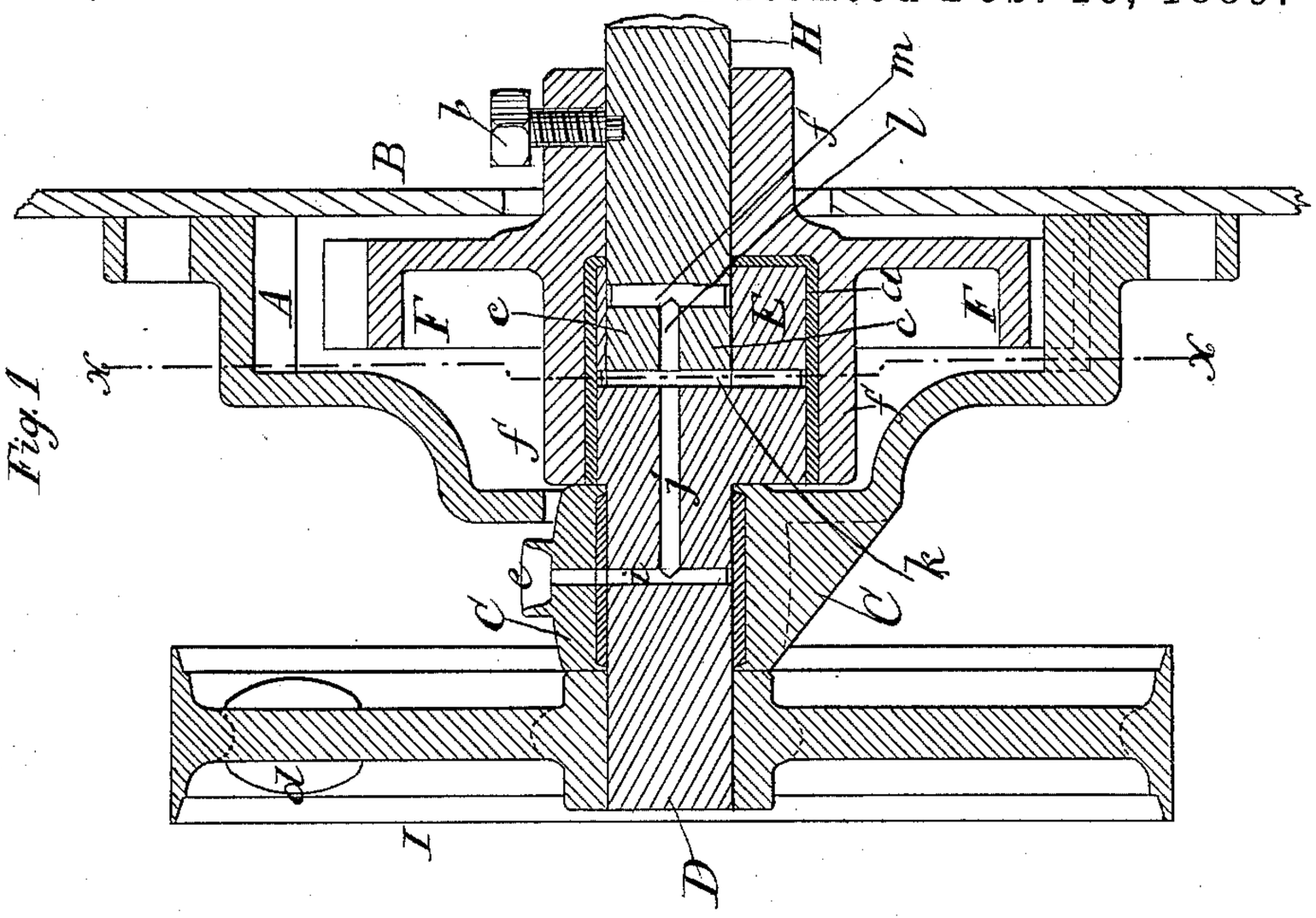
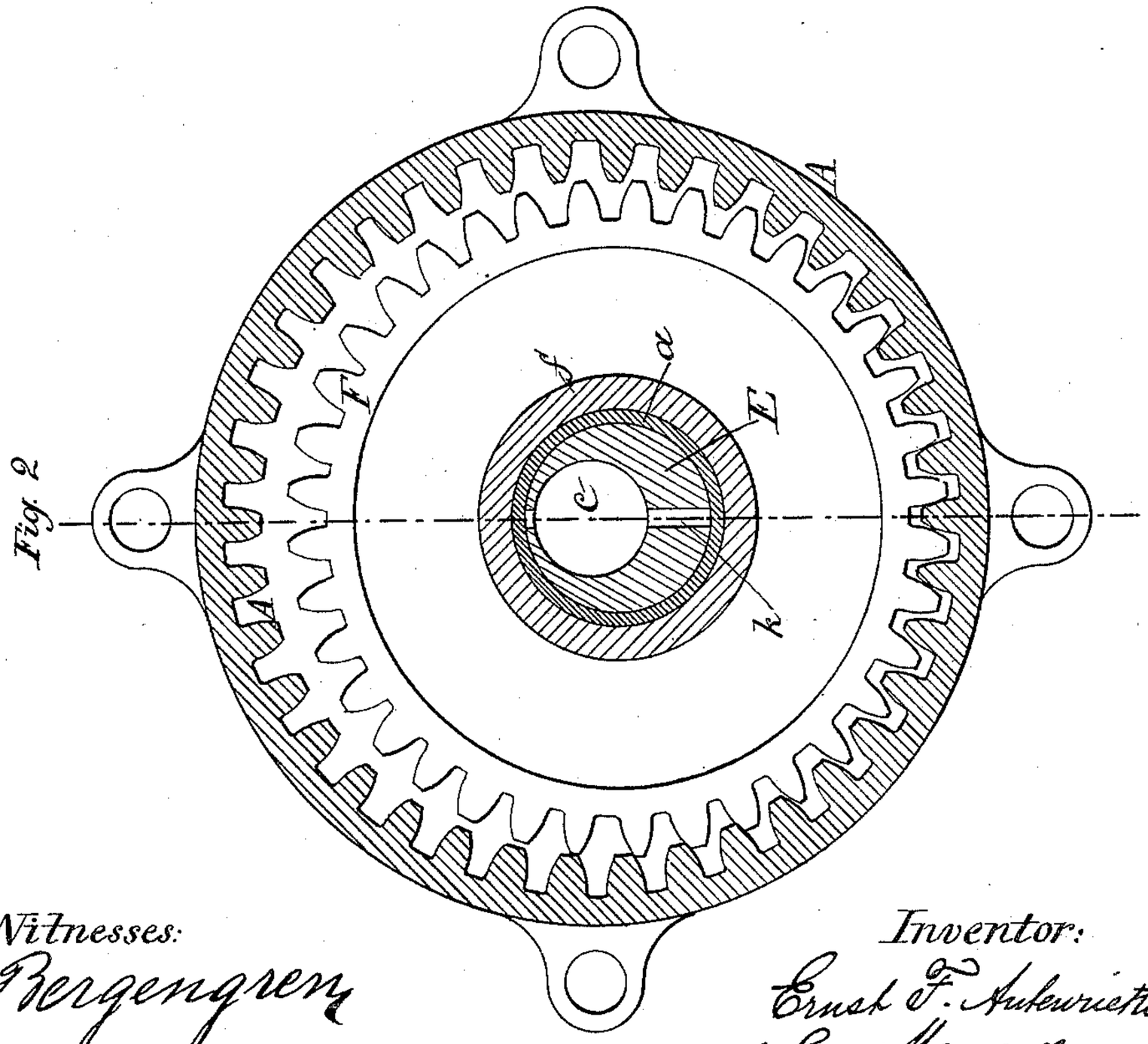


Fig. 2



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(No Model.) 2 Sheets—Sheet 2.

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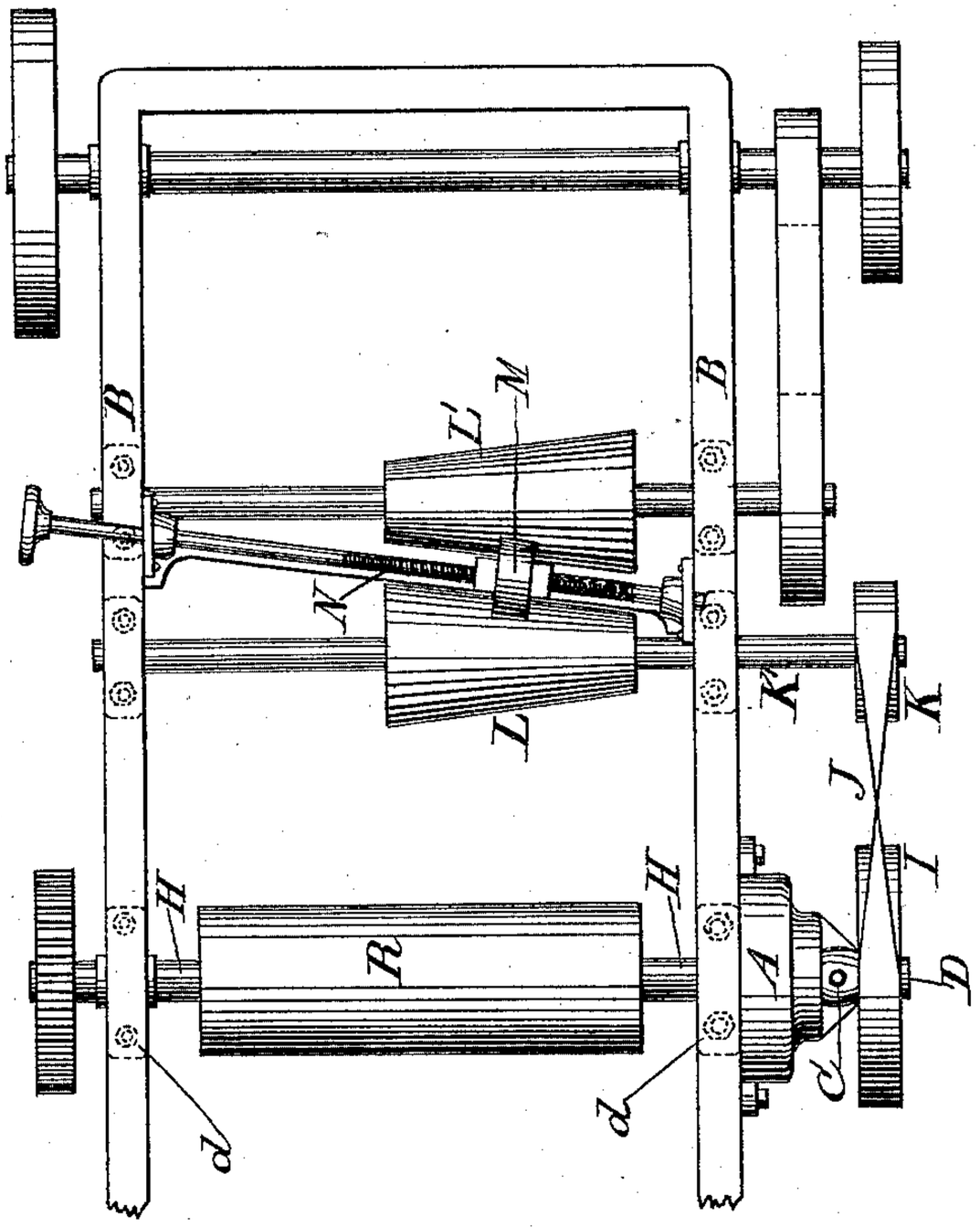
Fig. 3



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UNITED STATES PATENT OFFICE.

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MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 398,214, dated February 19, 1889.

Application filed November 13, 1888. Serial No. 290,662. (No model.)

To all whom it may concern:

Be it known that I, ERNST F. AUTENRIETH, of New York, in the county of New York, and State of New York, have invented a new and useful Improvement in Mechanical Movements, of which the following is a specification, reference being had to the accompanying drawings.

The object of this invention is to provide in a very compact form gearing for the purpose of transmitting rotary motion at a reduced speed.

I will now proceed to describe my invention in detail, and afterward point out its novelty in claims.

Figure 1 represents a central vertical section of a driving-shaft and a portion of a driven-shaft having my invention applied. Fig. 2 represents a vertical section in the line *x x* of Fig. 1 as viewed from the left. Fig. 3 is a plan of a portion of a wood-planing machine, illustrating the application of my invention thereto.

Similar letters of reference designate corresponding parts in all the figures.

A designates an internally-toothed spur-gear, which is intended to be fastened in a fixed position to a stationary support—as, for instance, the framing B of the machine to which my invention is to be applied.

C designates a fixed journal-box for the support of the driving-shaft D. This journal-box is arranged in front or outside of the gear A in concentric relation thereto. In the example of my invention represented this box is rigidly connected to the gear A by having its lower part in the same casting therewith.

On the driving-shaft D there is secured an eccentric, E, which projects within the fixed gear A, as shown in Fig. 1. In the example of my invention represented this eccentric is made in the same piece with the shaft D.

F designates an externally-toothed spur-gear corresponding in pitch with the fixed internally-toothed gear A, but having a smaller number of teeth. This gear F is arranged within the fixed internally-toothed spur-gear A. The hub *f* of this gear F is bored from one end concentrically to its pitch-line to receive and constitute a bearing for the eccentric E on the driving-shaft D. This concentric bore is represented in Figs. 1 and 2 as having fitted tightly to it a bushing, *a*, of hard metal, in which the eccentric is fitted to turn freely. The said hub is bored eccentrically from its other end to receive the shaft H to be driven, which I will hereinafter speak of as the "second shaft," to which the gear F is firmly secured by any suitable means, as, for instance, a set-screw, *b*, as shown in Fig. 1.

The eccentricity of the second shaft, H, to its gear F corresponds with the eccentricity of the eccentric E to its shaft D. The second shaft, H, is in line with the driving-shaft D. It may be supported in any suitable bearings; but I prefer that, as shown in Fig. 1, the inner end of the said shaft shall be fitted as a journal to a bearing, *c*, made by boring the eccentric E, or the end of the driving-shaft D. In Fig. 3 the second shaft, H, is also represented as supported in bearings in the machine-frame B, the said bearings being indicated in dotted outline. The driving-shaft D is represented as furnished with a driving-pulley, I, and this driving-pulley is represented as being furnished with a counter-balance, *d*, to counterbalance the eccentric E.

In order to provide for the oiling of the eccentric-bushing *a* and the journal-bearing *c* from the oil-cup *e* of the journal-box C, I provide in the shaft D, within the journal-box C, a transverse passage, *i*, opposite the oil-hole of the cup *e*, and through the eccentric E and shaft D a central longitudinal passage, *j*, which meets the transverse passage *i*, before mentioned. I also provide in the eccentric a transverse passage, *k*, and I further provide in the second shaft, H, a central passage, *l*, and a transverse passage, *m*, the latter passage being within the bearing *c*. The oil flows from the oil-cup *e* and journal-box through the passages *i j k l m*, supplying oil to the eccentric through the passage *k*, and also supplying it to the journal C through the passages *l* and *m*.

The operation of the movement is as follows: Rotary motion being transmitted through the pulley I to the shaft D and eccentric E, the

gear A is carried round by the eccentric E in an eccentric orbit within and in gear with the fixed gear A, and this motion within the gear A causes it to have a slow rotation about the common axis of the two shafts, and this rotation is also given to the second shaft, H, to which it is secured. The velocity of this rotation will depend upon the relative number of teeth within the gears A and F, being as the difference between the number of teeth in the two gears is to the number of teeth in the small gear—for instance, in the example represented there are thirty-eight teeth in the large gear A and thirty-six in the smaller one F, the difference in the number of teeth being two, and the smaller wheel of the shaft H making eighteen revolutions for every revolution of the driving-shaft D.

The example of my invention illustrated in Fig. 3 shows the movement applied to drive the shaft H of the first feed-roll, R, of the planing-machine. The driving-pulley I on the shaft D receives motion from a belt, J, from the pulley K on the shaft K′ of one of two cone-pulleys, L L′, of which L derives motion from L′ through an intermediate friction-wheel, M, which is capable of being adjusted lengthwise of the said cone-pulleys by means of a screw, N.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with an internally-toothed stationary gear, a driving-shaft concentric with said gear and an eccentric carried by said driving-shaft, of a second shaft arranged in line with the driving-shaft, a gear having fewer teeth arranged within and gearing with said stationary gear and secured fixedly on the second shaft in eccentric relation thereto and containing a concentric bearing fitted loosely to the eccentric on the driving-shaft, substantially as herein described.

2. The combination of an internally-toothed stationary gear, a driving-shaft concentric therewith and an eccentric carried by said driving-shaft, a second shaft arranged in line with the driving-shaft, a gear internal to and gearing with said stationary gear secured fixedly on the second shaft in eccentric relation thereto and fitted to the eccentric on the driving-shaft, and a bearing within said eccentric for the end of the second shaft, substantially as herein described.

3. The combination, with a driving-shaft, a stationary internally-toothed gear, and a journal-box for said driving-shaft secured concentrically upon said toothed gear, of an eccentric fast upon the said driving-shaft, a second shaft in line with the driving-shaft, and an eccentric gear fast on the second shaft and fitting loosely to the eccentric on the driving-shaft, substantially as herein described.

4. The combination of an internally-toothed stationary gear, a driving-shaft concentric therewith, a stationary journal-box for said shaft, an eccentric carried by said shaft, a second shaft arranged in line with the driving-shaft, an eccentric gear secured to said second shaft in eccentric relation thereto and fitted to the eccentric on the driving-shaft, and a bearing within said eccentric for the end of the said second shaft, the said driving-shaft and eccentric having longitudinal and transverse oil-passages, and the said second shaft having longitudinal and transverse oil-passages, substantially as herein described, whereby oil is to be delivered from said stationary journal-box to the exterior of the eccentric, and also to the bearing provided within the eccentric for the second shaft, all substantially as herein described.

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