

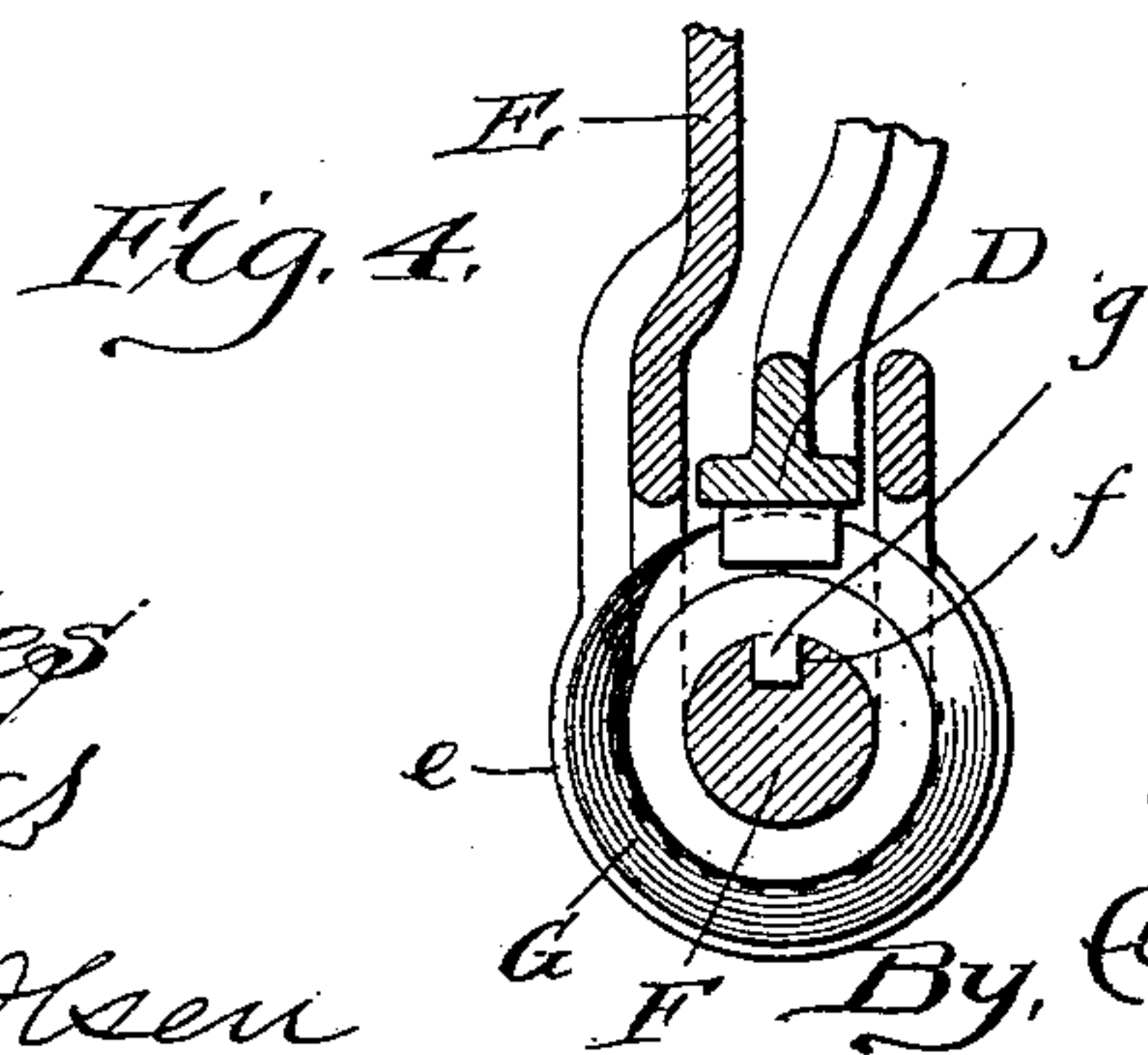
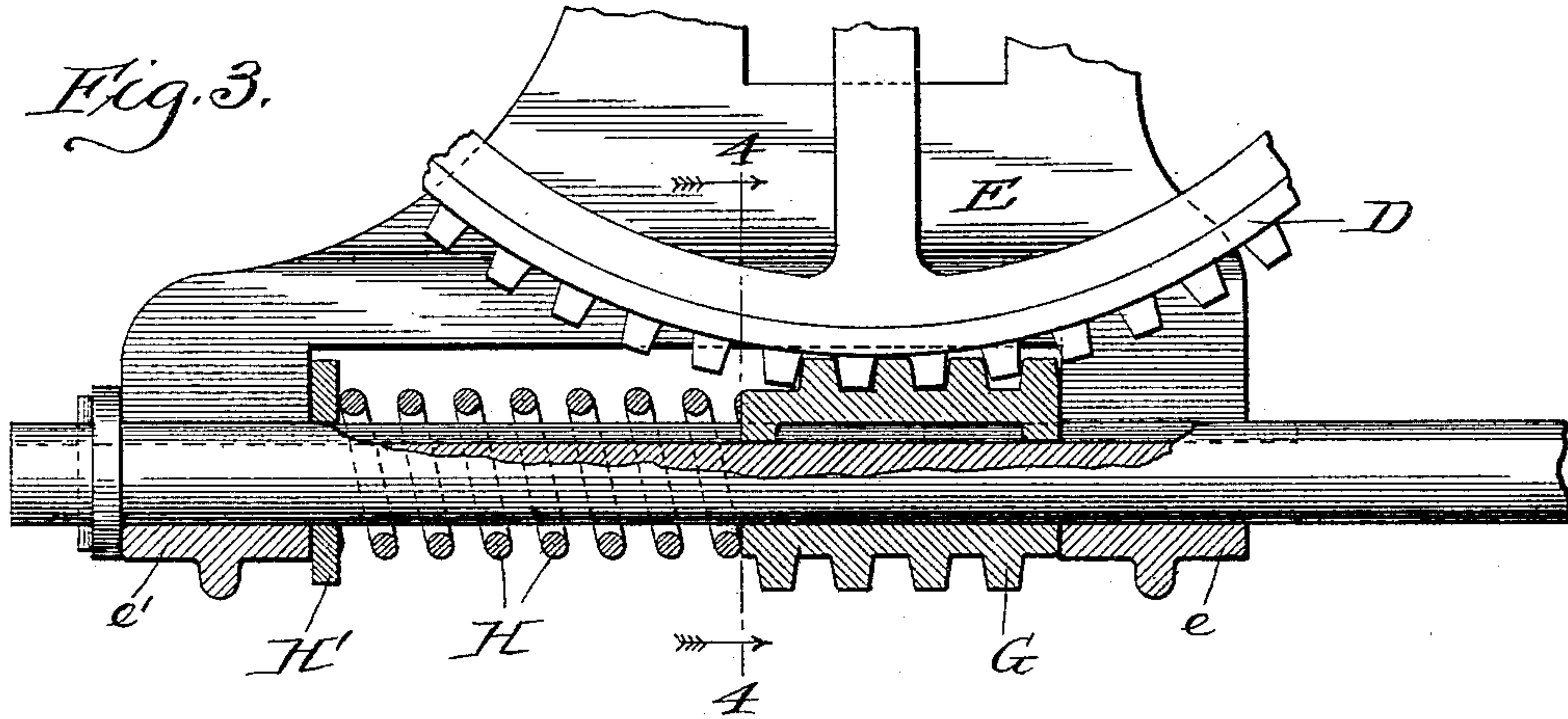
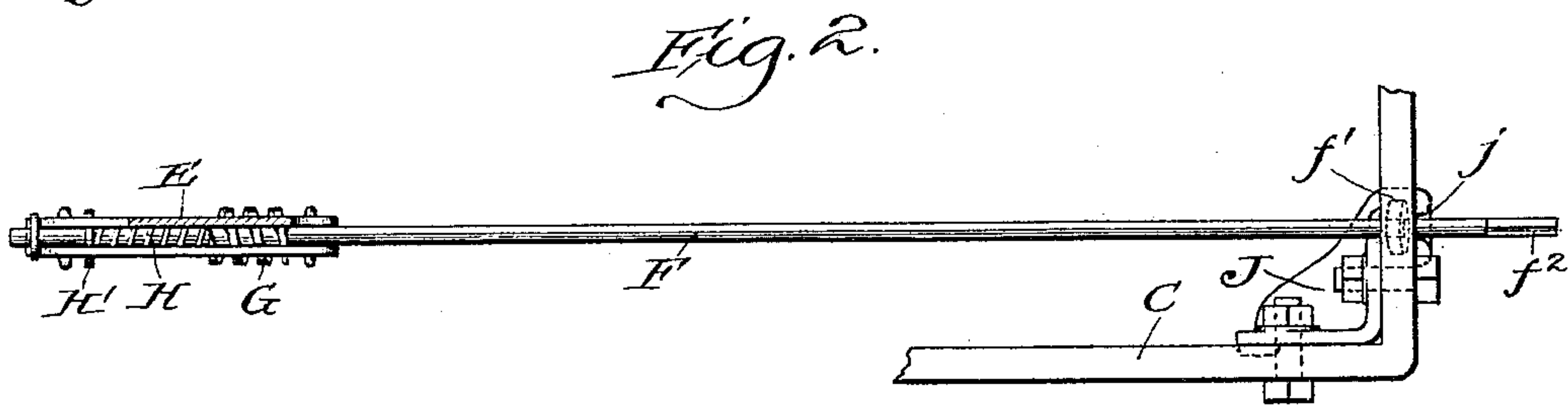
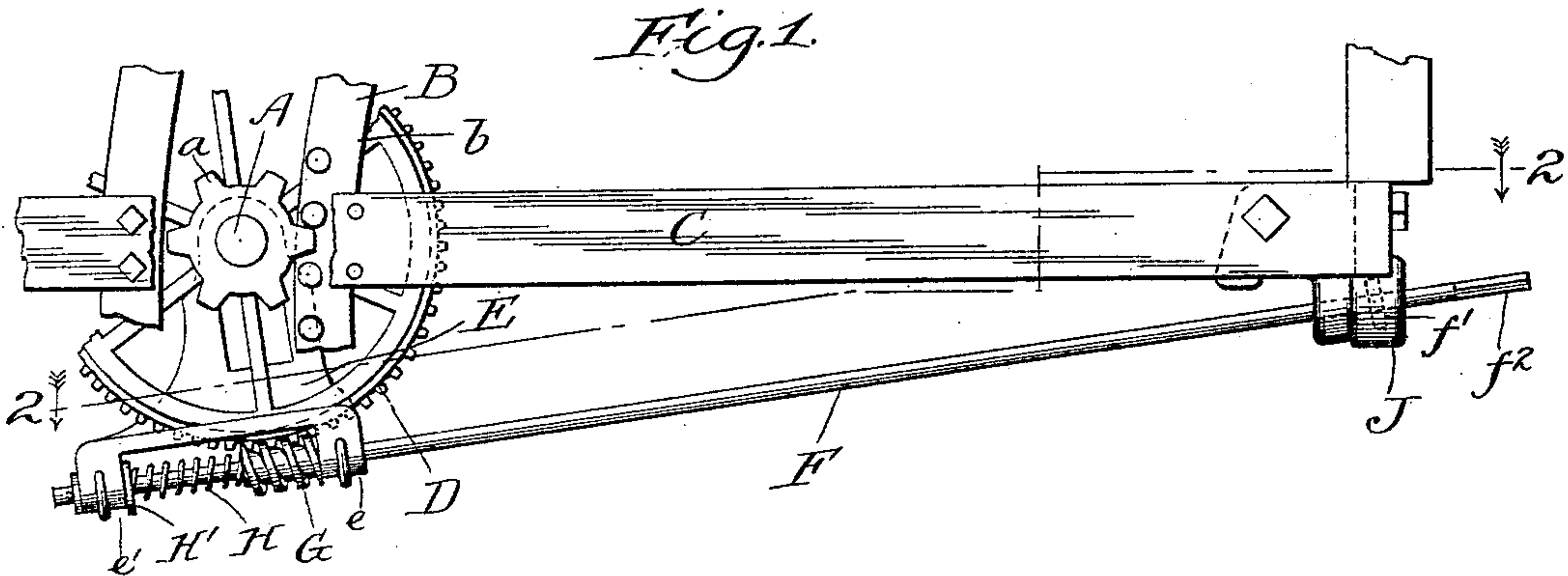
No. 618,111.

Patented Jan. 24, 1899.

J. MACPHAIL.  
HARVESTER.

(No Model.)

(Application filed Mar. 7, 1898.)



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# UNITED STATES PATENT OFFICE.

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## HARVESTER.

SPECIFICATION forming part of Letters Patent No. 618,111, dated January 24, 1899.

Application filed March 7, 1898. Serial No. 672,935. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES MACPHAIL, a citizen of the United States, residing at Blue Island, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Harvesters, of which the following is a specification.

My invention relates to harvesters; and its object is to provide suitable and efficient mechanism for raising and lowering the main frame of the harvester and for protecting the machinery from the effects of unusual shocks or jars to the main or ground wheel of the harvester.

In the drawings, Figure 1 is a side elevation of a portion of a harvester, showing my device in position thereon; Fig. 2, a sectional plan on the irregular line 2 2 of Fig. 1; Fig. 3, an enlarged sectional elevation of a part of the device; and Fig. 4, a section on the line 4 4 of Fig. 3, looking in the direction of the arrow.

The main axle or shaft A of the usual master or ground wheel has fixed thereon a pinion *a*, adapted to engage the teeth or pins *b* upon the ordinary sector-arm B, which is secured to the main frame C of the harvester. A worm-gear D is cast solid with the pinion or made separate and fastened thereto, as may be desired, and is mounted on the main axle.

A yoke or hanger E is mounted loosely upon the shaft, and its lower portion is hook-shaped and provided with bearings *e e'*, arranged beneath the worm-gear and in the same vertical plane. The forward end of the operating-shaft F is mounted in these bearings and is provided with a groove *f*, which is adapted to receive a feather *g* of a worm G. This worm, which meshes with the gear D, is located on the shaft between the bearings *e e'* and is permitted to rotate with the shaft and to move longitudinally thereon.

Suitable means, such as a coiled spring H, abutting at one end against the worm G and at the other against the washer H', loosely arranged on the operating-shaft, keep the worm in normal position against the portion *e*, as shown in the drawings.

The rear end of the operating rod or shaft is loosely mounted in a bracket J, which is

secured to the main frame and provided with an upwardly-extending opening *j*, so as to receive the operating-shaft. This shaft has a button *f'*, cast or otherwise formed on itself, which button is adapted to be received by such bearing, whereby the operating rod or shaft will be free to rotate and to move vertically whenever occasion requires.

My device, being constructed as hereinbefore set forth, operates as follows: When the operating-shaft is rotated by any suitable crank applied to the angular end *f<sup>2</sup>* of the shaft, the worm communicates the movement through the gear and the rack-and-pinion device, so as to raise or lower the main frame. In case of an unusual shock or of any jar to the machinery the tendency of the worm-gear is to rotate, and consequently to exert a pull on the worm, so as to move it in a direction longitudinal of the shaft. If the worm was rigid on the operating-shaft without any compensating mechanism, such shaft would receive the whole strain; but in my construction the shaft is entirely relieved in such a contingency. When the worm-gear is thus caused to rotate, it will force the worm to the left, Fig. 1, upon the operating-shaft against the tension of the spring, which is powerful enough to subsequently restore the parts to their normal positions. The operating-shaft is thus freed from any strain whatsoever in case of any shock or jar to the main or ground wheel of the harvester.

Although I have described more or less precise forms and details of construction, I do not wish to be understood as limiting myself thereto, as I contemplate changes in form, the proportion of parts, and the substitution of equivalents, as circumstances may suggest or render expedient and without departing from the spirit and scope of my invention.

I claim—

1. In a harvester, the combination, with the main frame and axle of the harvester, of a rack-and-pinion device for raising and lowering the main frame, a worm-gear for actuating the pinion, an operating-shaft and a worm movable longitudinally upon the shaft and meshing with the worm-gear.

2. In a harvester, the combination, with the main frame and axle of the harvester, of



a rack-and-pinion device for raising and lowering the main frame, a worm-gear for actuating the pinion, an operating-shaft, a worm movable longitudinally upon the shaft and meshing with the worm-gear and means for holding the worm in normal position upon the shaft.

3. In a harvester, the combination, with the main frame and axle of the harvester, of a rack upon the frame, a pinion engaging the rack and fixed upon the axle, a worm-gear connected to the pinion, an operating-shaft, a worm movable longitudinally upon the shaft and meshing with the worm-gear and a coiled spring holding the worm in normal position upon the shaft but permitting it to move thereon against the tension of such spring.

4. In a harvester, the combination, with the main frame and axle of the harvester, of a rack-and-pinion device upon the frame, a worm adapted to actuate said device, and an operating-shaft carrying the worm, such worm being mounted upon the shaft by a feather and groove.

5. In a harvester, the combination, with the main frame of the harvester, of raising and lowering mechanism for the main frame, an operating-shaft, and a worm adapted to actuate such mechanism and mounted upon the shaft, such worm being rotatable with the shaft but having an independent movement longitudinally of the shaft.

6. In a harvester, the combination, with the main frame and axle of the harvester, of a rack-and-pinion device for raising and lowering the main frame, a worm-gear for actuating the pinion, a yoke loosely mounted upon the axle and provided with bearings at its

lower portion, an operating-shaft arranged in such bearings and a worm rotatable with, but having a longitudinal movement on, the shaft and adapted to engage with said worm-gear.

7. In a harvester, the combination, with the main frame and axle of the harvester, of a rack-and-pinion device for raising and lowering the main frame, a worm-gear for actuating the pinion, a yoke loosely mounted upon the axle and having a lower hook portion with two bearings beneath the said worm-gear and in substantially the same vertical plane, an operating-shaft mounted in said bearings, a worm mounted upon the shaft and having an independent longitudinal movement thereon and a spring arranged between said bearings and adapted to keep the worm in normal position and against said independent movement.

8. In a harvester, the combination, with the main frame and axle of the harvester, of a rack-and-pinion device for raising and lowering the main frame, a worm-gear for actuating the pinion, a yoke loosely mounted upon the axle and provided with bearings substantially beneath the worm-gear, an operating-shaft journaled at one end in said bearings, a button substantially near the other end of the shaft, a bracket arranged upon the frame and adapted to receive the said other end of the shaft and its button, a worm arranged upon the shaft and having an independent longitudinal movement and a spring holding the worm in normal position.

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