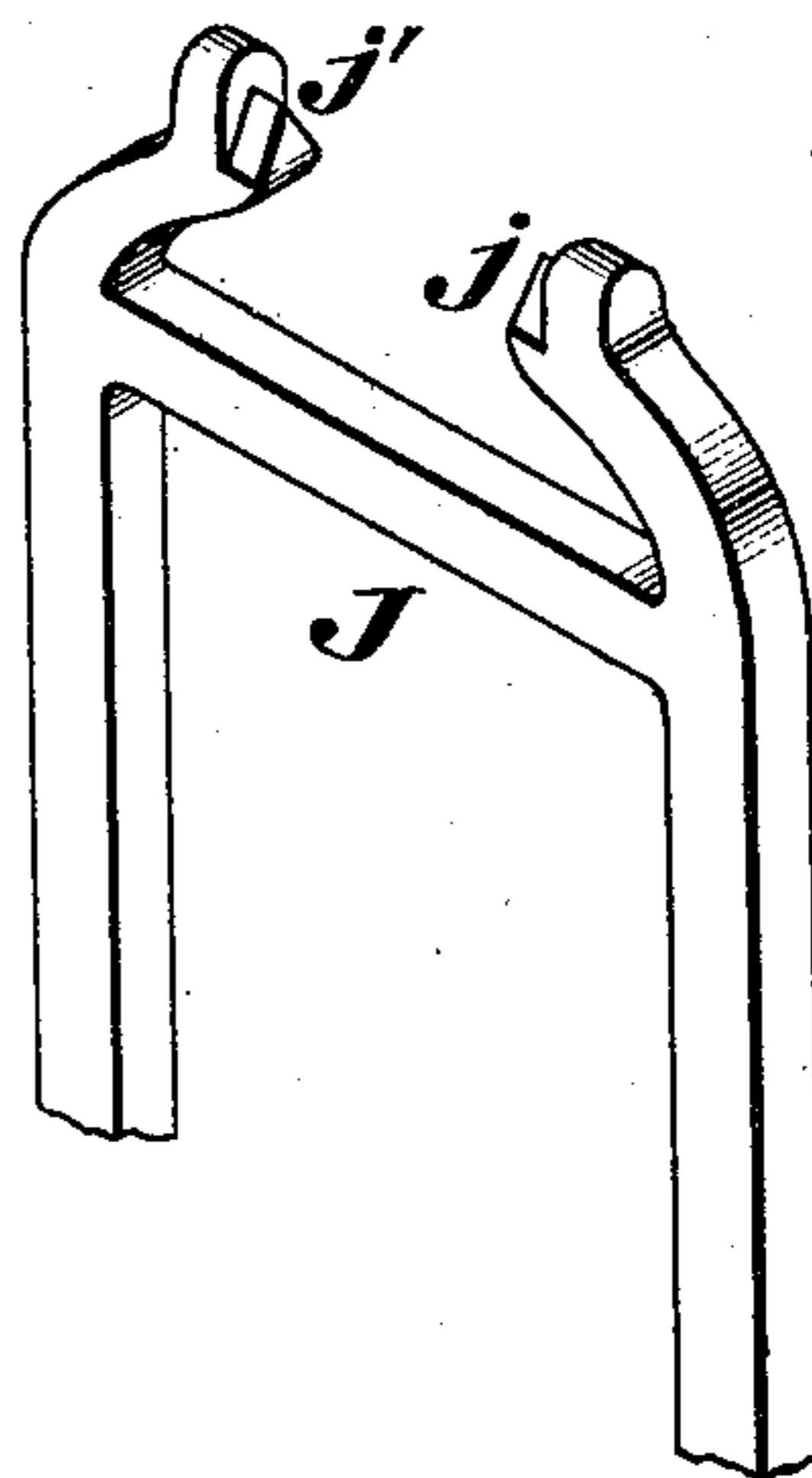
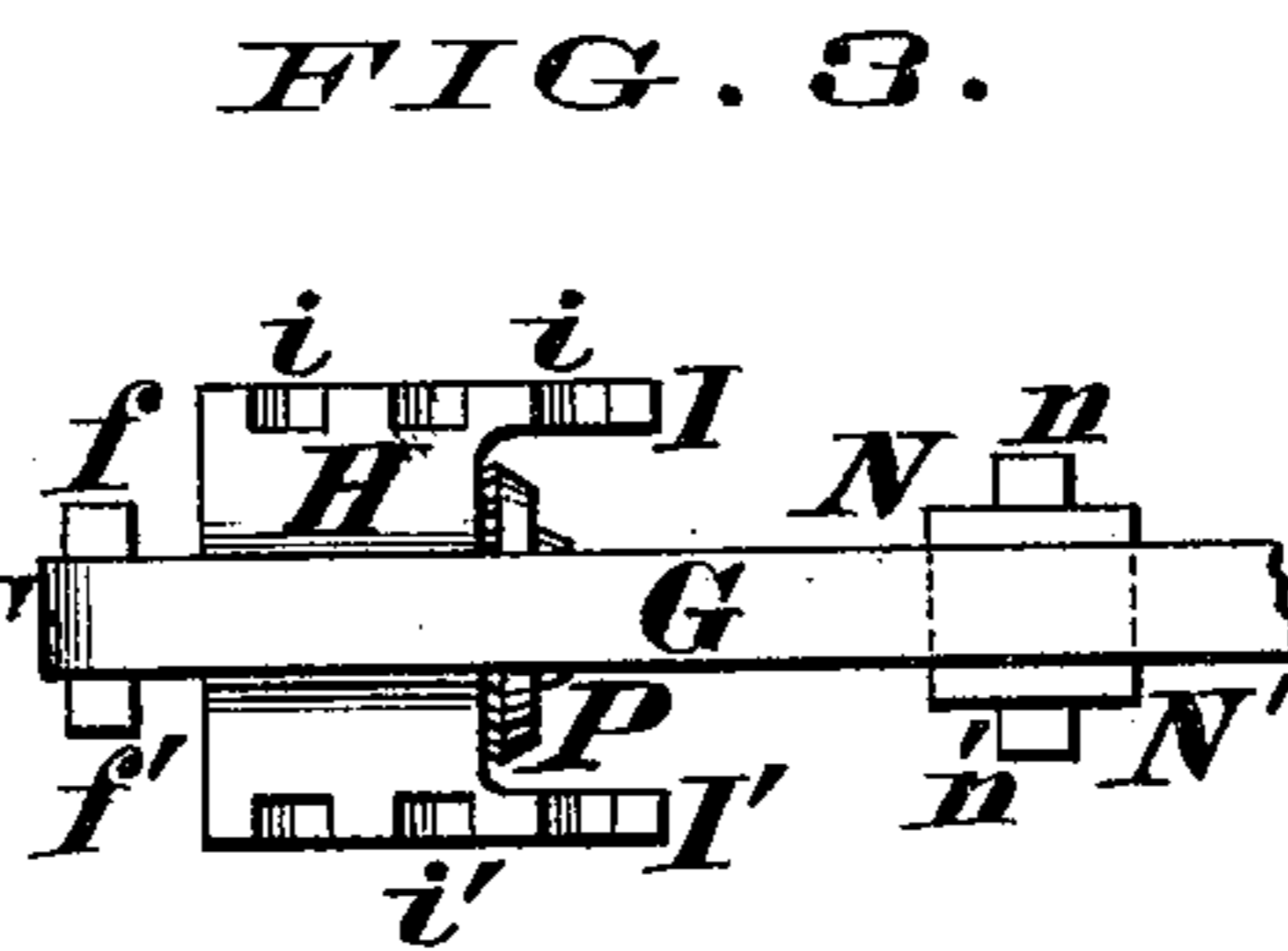
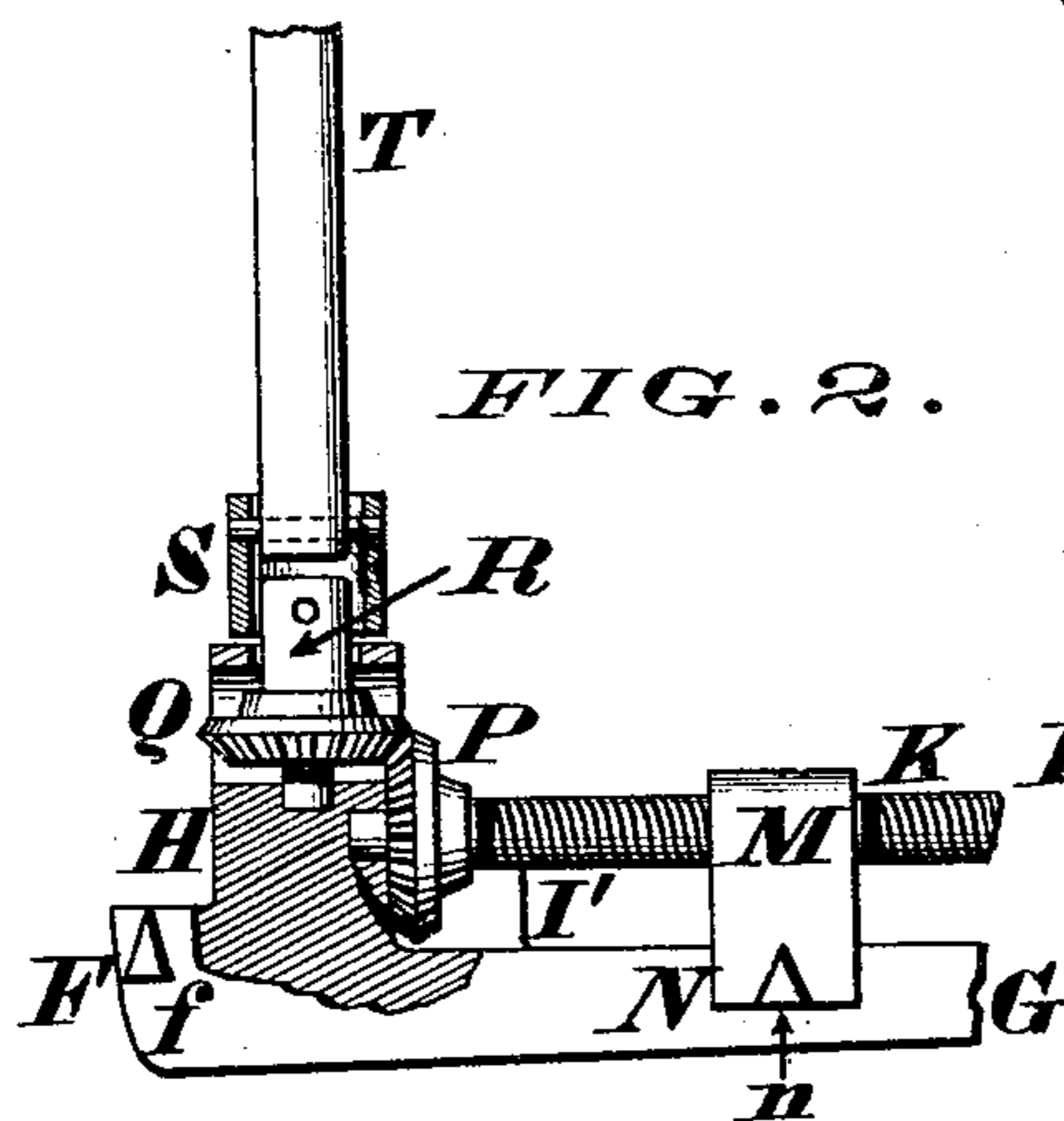
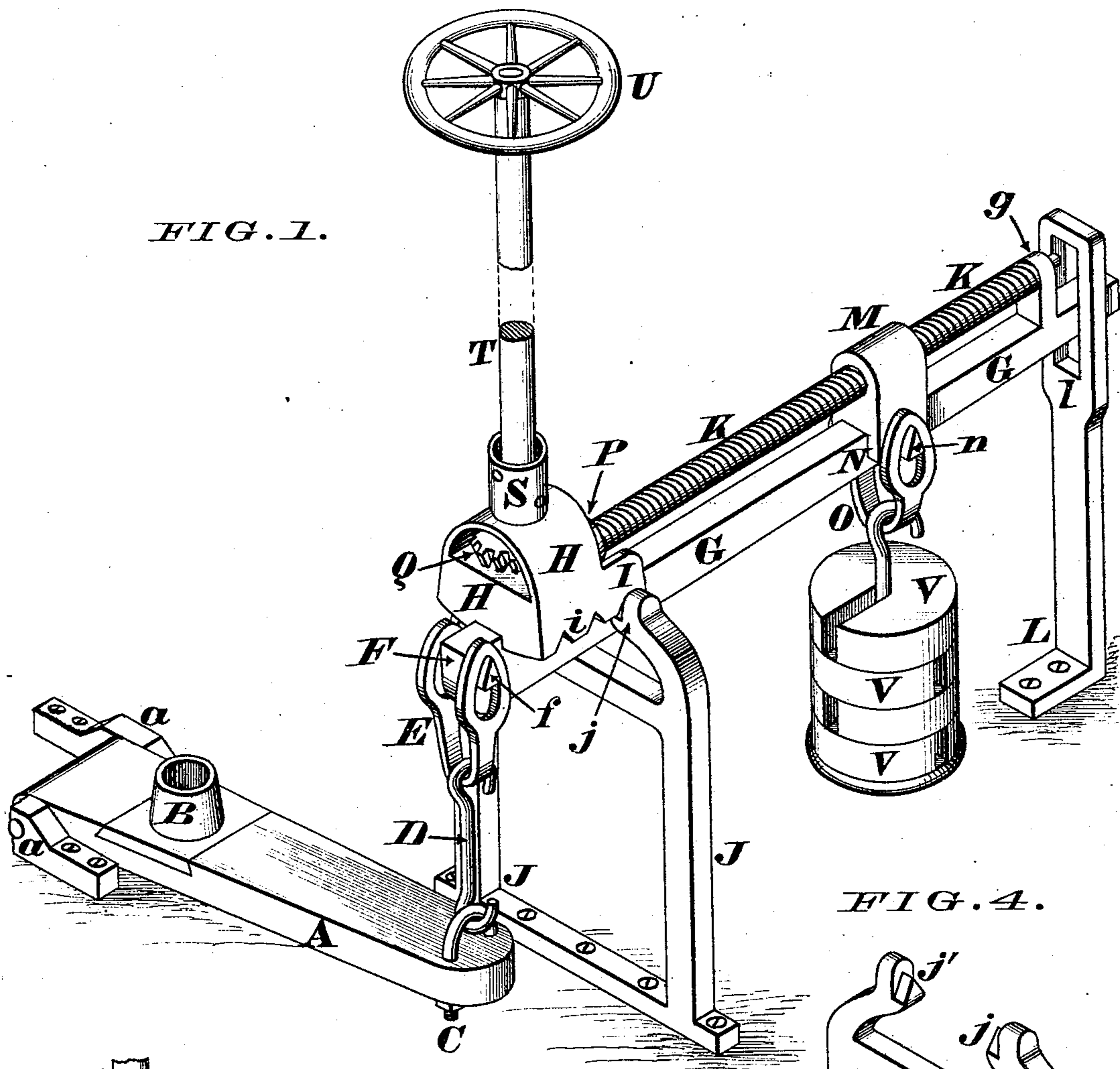


H. KLINKERMANN.
Counter-Balancing Mill-Stone.

No. 166,785

Patented Aug. 17, 1875.



Attest.

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W. J. Farmer.

H. Klinkermann
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UNITED STATES PATENT OFFICE.

HERMAN KLINKERMANN, OF DILLSBOROUGH, INDIANA.

IMPROVEMENT IN COUNTERBALANCING MILLSTONES.

Specification forming part of Letters Patent No. **166,785**, dated August 17, 1875; application filed May 28, 1874.

To all whom it may concern:

Be it known that I, HERMAN KLINKERMANN, of Dillsborough, Dearborn county, Indiana, have invented a new and useful Mode of Counterbalancing Millstones, of which the following is a specification:

The object of my invention is to counter-balance millstones in such a manner as to enable them to be self-compensating, thereby insuring a perfect uniformity of meal, no matter how much the spindle may expand or contract; and this automatic counter-balance also allows stones or other obstructions to pass through between the burrs without injuring them. To accomplish this result I dispense with the old-fashioned rigid and unyielding screw, which has heretofore been employed for supporting the free end of the bridge-tree, and substitute therefor a link, chain, or other flexible coupling, which depends from the heel of a lever or steelyard, the latter being loaded with a suitable weight or weights, capable of being adjusted longitudinally of said steelyard, either by hand or by other mechanical appliances. After this weight has been once set to any determined point, so as to exert the desired upward pressure against the spindle for the purpose of grinding the grain to a certain degree of fineness, it will be impossible to affect the running of the mill so as to alter the quality of the meal, for it is evident that the moment the spindle contracts from any cause whatever, and tends to bring the stones in too close proximity to each other, the steelyard will give, and thus automatically adjust itself to compensate for the shortening of the spindle. If, on the contrary, the spindle should expand, thereby separating the stones and causing the grain to be ground too coarse, the steelyard will allow the bridge-tree to fall, and restore the burr to its original position.

Having thus briefly indicated the leading features of my improvements, I will now proceed to give a detailed description of the same.

In the accompanying drawings, Figure 1 is a perspective view of my improved device for counterbalancing millstones. Fig. 2 is a vertical section through the heel of the steelyard and its accessories. Fig. 3 is a plan of the under side of the steelyard-heel, and Fig. 4 is

a perspective view of the supports for the steelyard.

A represents an ordinary bridge-tree, which is pivoted to the floor or frame of the mill at *a*, and is provided with the customary step B, for the reception of any approved form of spindle. Secured to the outer or free end of this bridge-tree is a staple, C, with which engages one end of a link, D, whose upper end is hooked over a shackle, E, the latter being suspended from the two knife-edged bearings *f f'* of the heel F of a steelyard, lever, or scale-beam, G.

If preferred, the devices C, D, and E may be omitted, and a chain, wire-rope, or other flexible coupling substituted for them.

Secured to the steelyard G, and near the heel thereof, is a housing, H, having cheeks I I', which are provided, respectively, with a series of notches, *i i'*, that are adapted to bear upon the knife-edged fulcrums or pivots *j j'*. These pivots are formed upon or else attached to a frame or bracket, J, that supports the steelyard G. Journaled within the housing H is one end of a screw, K, which is parallel with the steelyard G, and has its other end journaled in a lug, *g*, that projects upwardly from the toe of said steelyard. Lateral movement of the toe of the steelyard is prevented by passing it through a slot, *l*, of an upright, L. The screw K engages with a nut, M, whose cheeks N N' embrace the sides of the steelyard, so as to prevent any rotation of said nut when the screw is turned either to the right or left. These cheeks have outwardly-projecting knife-edged bearings *n n'*, from which a shackle, O, is suspended, and depending from said shackle are one or more weights, V, of any suitable size. Attached to the screw K is a bevel-wheel, P, that gears with a similar wheel, Q, the latter being keyed to a short vertical shaft, R, that is journaled within the housing H. S is a universal joint, which couples the shaft R to the main operating-shaft T, which latter may be carried up to any suitable height, and furnished with a hand-wheel or crank, U.

My compensating devices are manipulated so as to operate in the following manner: The hand-wheel U is first rotated so as to adjust the weight or weights V to such a position

upon the steelyard G as will produce the proper upward pressure upon the bridge-tree A and the spindle of the burr. The mill is then set running, and it is evident that the grain will be ground to a uniform fineness, whether the spindle expands or contracts, as previously explained; and it is also apparent that the steelyard G will turn upon its bearings *j j'* far enough to allow stones or other obstructions to pass through between the burrs without injuring them, after which the parts will resume their proper grinding positions.

The weights can be adjusted the entire length of the steelyard, and if this is not sufficient a greater range of movement can be obtained by inserting the bearings *j j'* in either of the notches *i i'*. It is also evident that the weight V, after once being adjusted, cannot be accidentally shifted by the vibrations of the mill or otherwise, as the screw K maintains it securely in any desired position.

The drawing shows my improvement as arranged for use with an upper-runner mill; but it is evident that, with a slight modification, it can be adapted for use with an under runner.

The nut M, resting upon the beam G, prevents the weights V springing the adjusting-screw K; and, if preferred, the beam can be graduated, so as to indicate the exact pressure brought to bear upon the support of the spindle. The object of the universal coupling S is to insure the correct action of the bevel-gears P Q in case the lever G should deviate

considerably from a horizontal position, as any such change would not destroy the vertical position of the main shaft T. Instead of employing the shafts R T and bevel-gears P Q for manipulating the screw, the latter may be turned with a crank or wrench applied at either of its ends, and the bridge-tree A can be in line with the steelyard, and not located at right angles to the same, as represented.

An inferior modification of my invention may be arranged by notching the upper edge of the steelyard, or else perforating it, and suspending the weight by a shackle from said notches, or else from a pin inserted in either of the apertures, in either of which cases the screw would be superfluous.

I claim as my invention—

1. The combination of pivoted bridge-tree A *a*, having removable step B, detachable connection C D E, and steelyard G, having weights V, and whose supporting-heel F has bearings *f f'*, as and for the purpose set forth.

2. The housing H, having cheeks I I', provided with a series of notches, *i i'*, for changing the position of the bearings, as set forth.

3. In combination with the vertical shafts R T, the bevel-wheels P Q and coupling S, as and for the purpose set forth.

In testimony of which invention I hereunto set my hand.

HERMAN KLINKERMANN.

Attest:

GEO. H. KNIGHT,
H. DANZELMAN.