

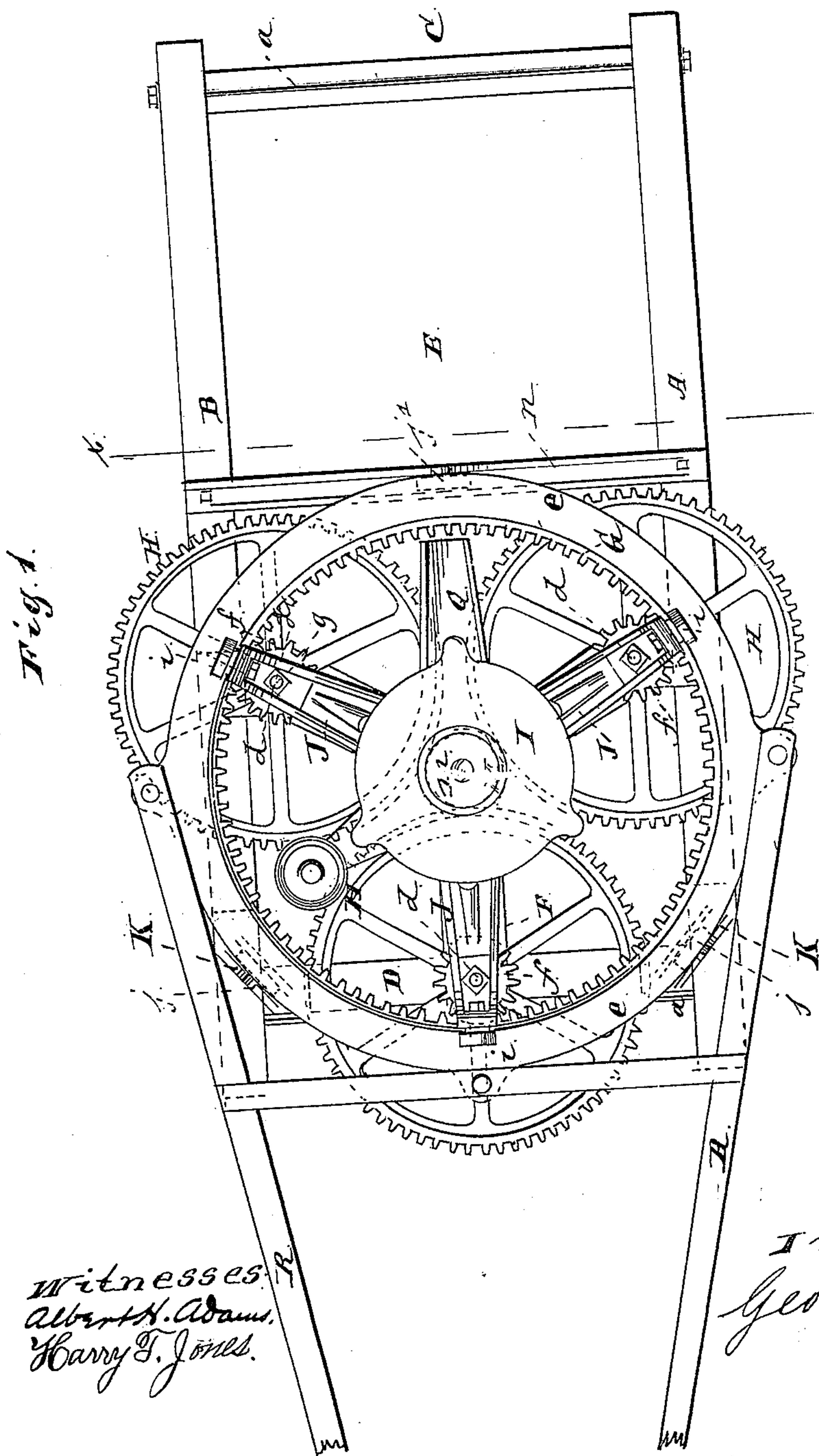
No Model.)

3 Sheets—Sheet 1.

G. K. SMITH.  
GRINDING MILL.

Patented Feb. 2, 1886.

No. 335,391.



Inventor:  
George K Smith

Witnesses:  
Albert H. Adams,  
Harry T. Jones.

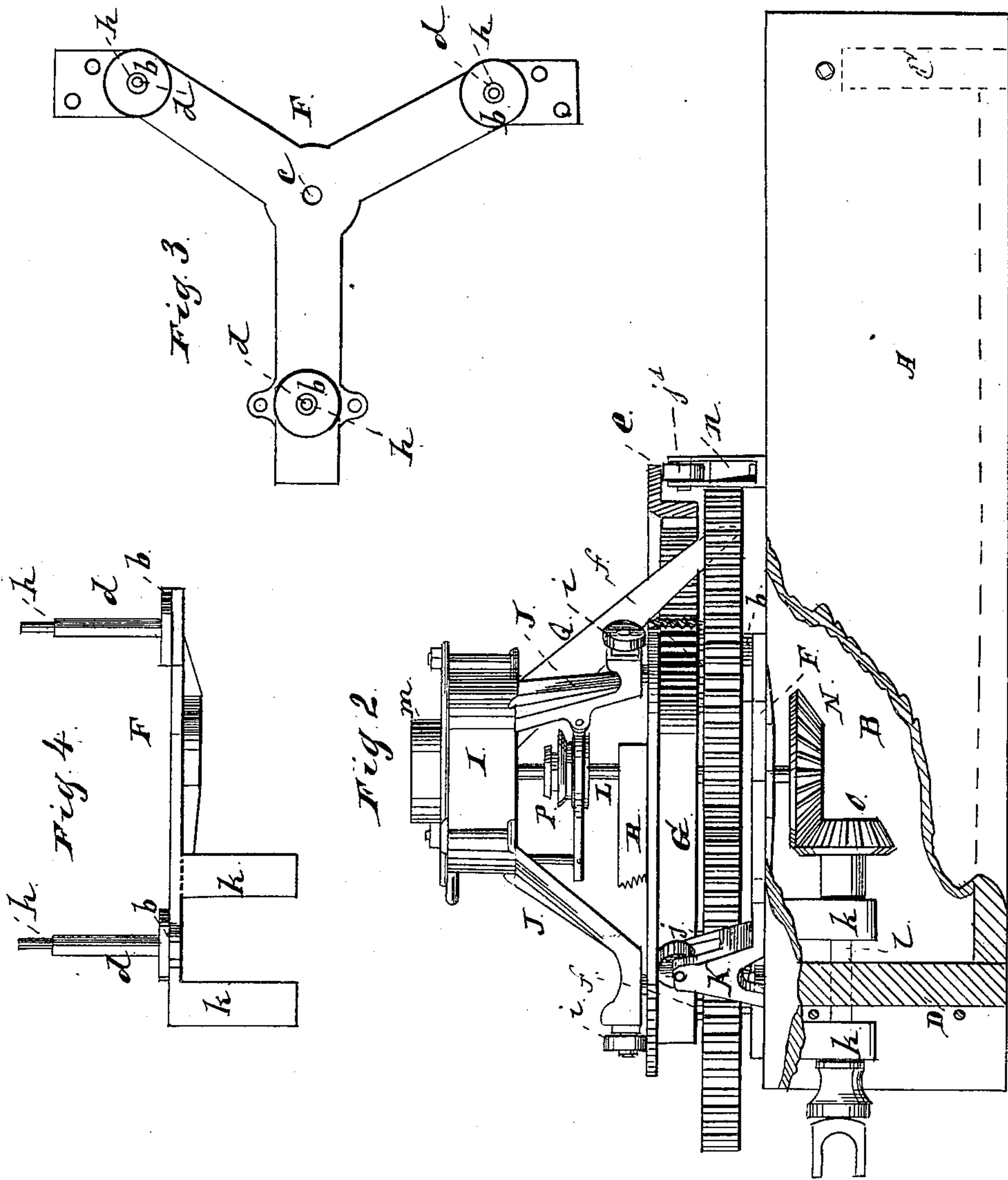
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Fig. 5.

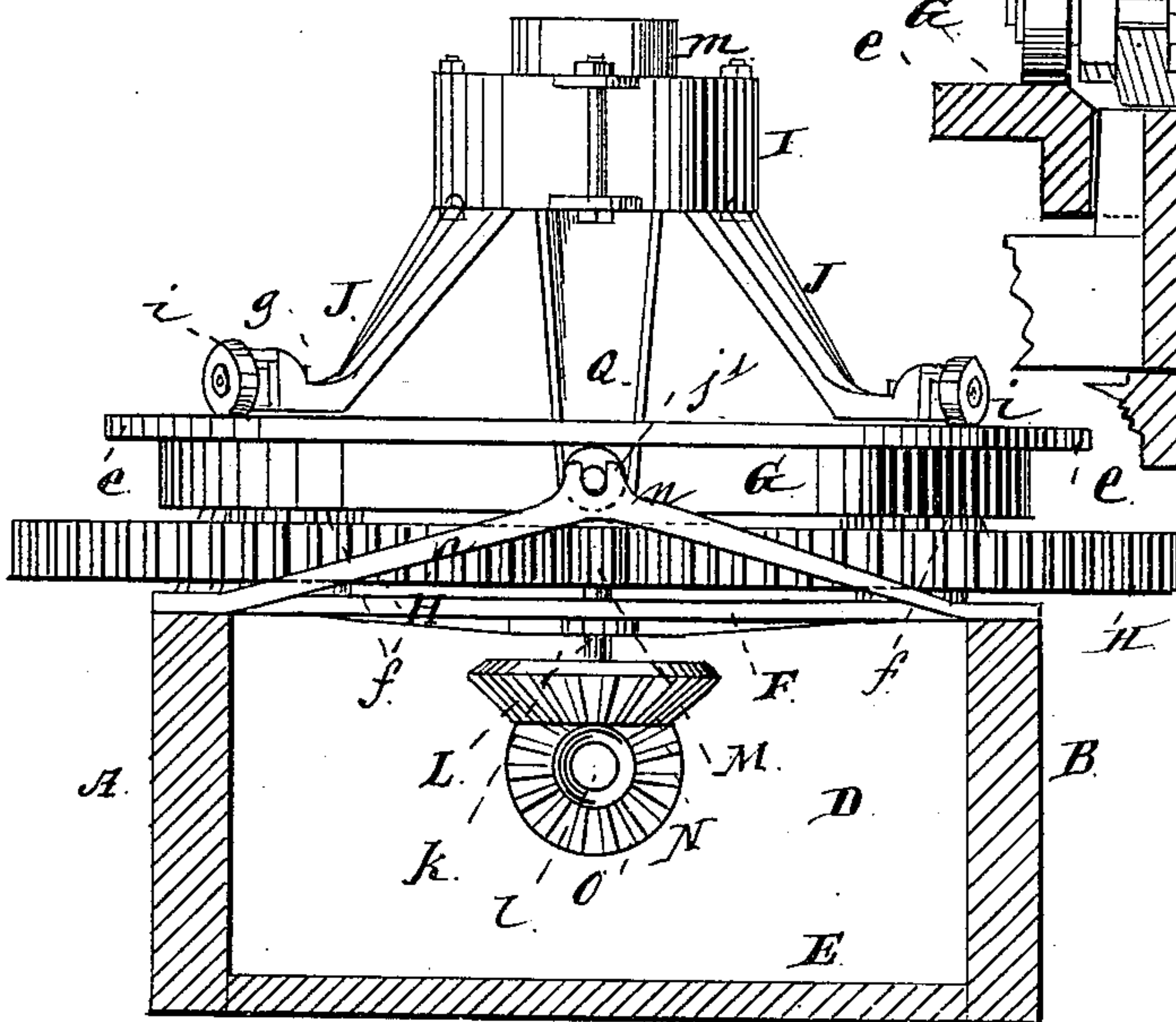


Fig. 6.

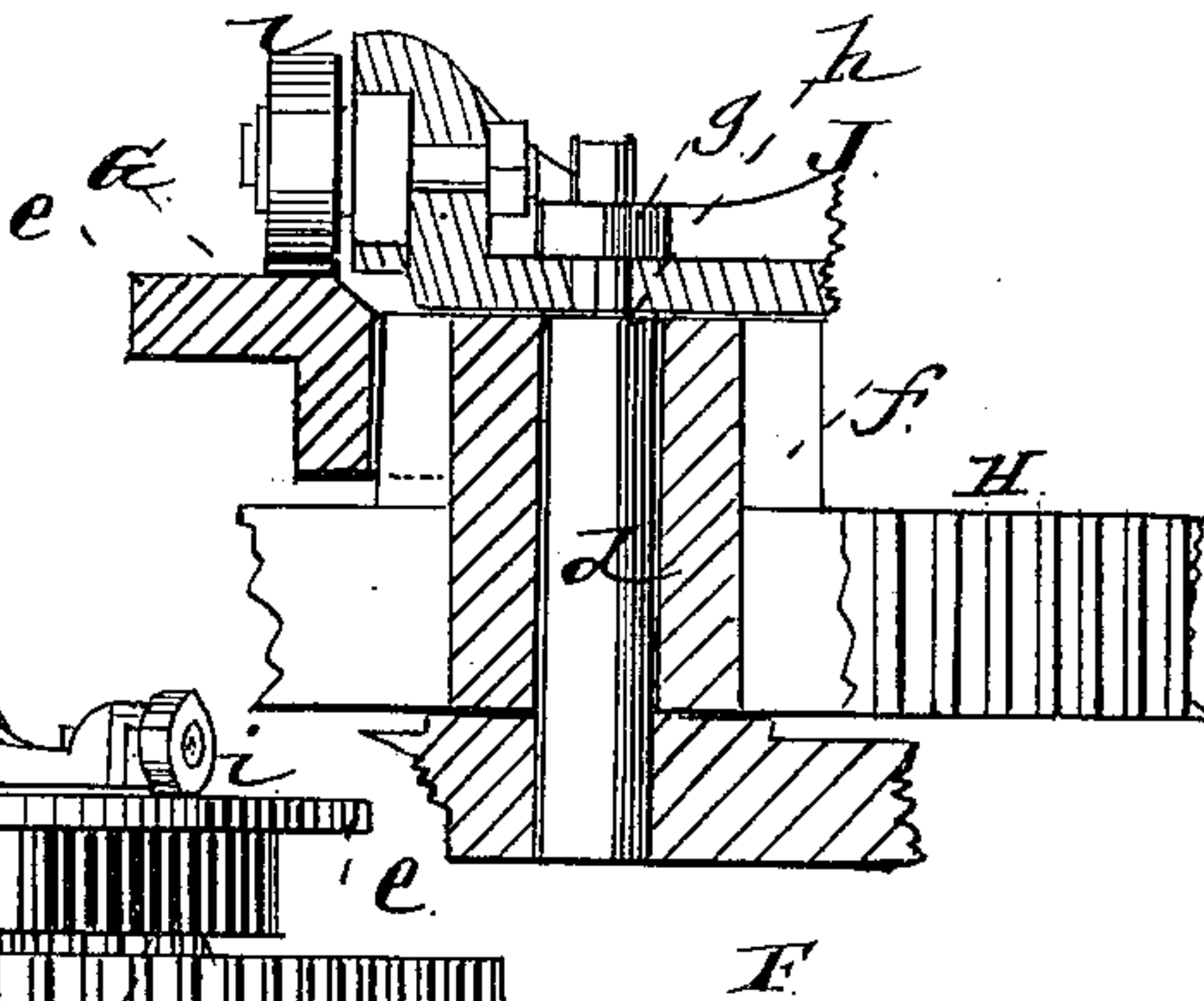


Fig. 7.

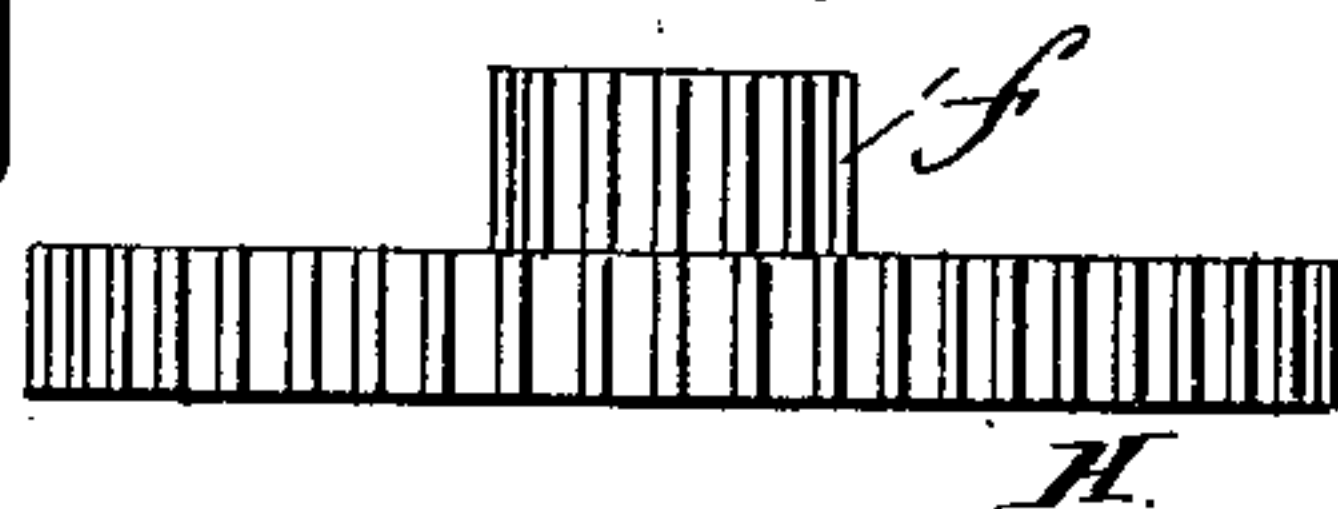


Fig. 9.

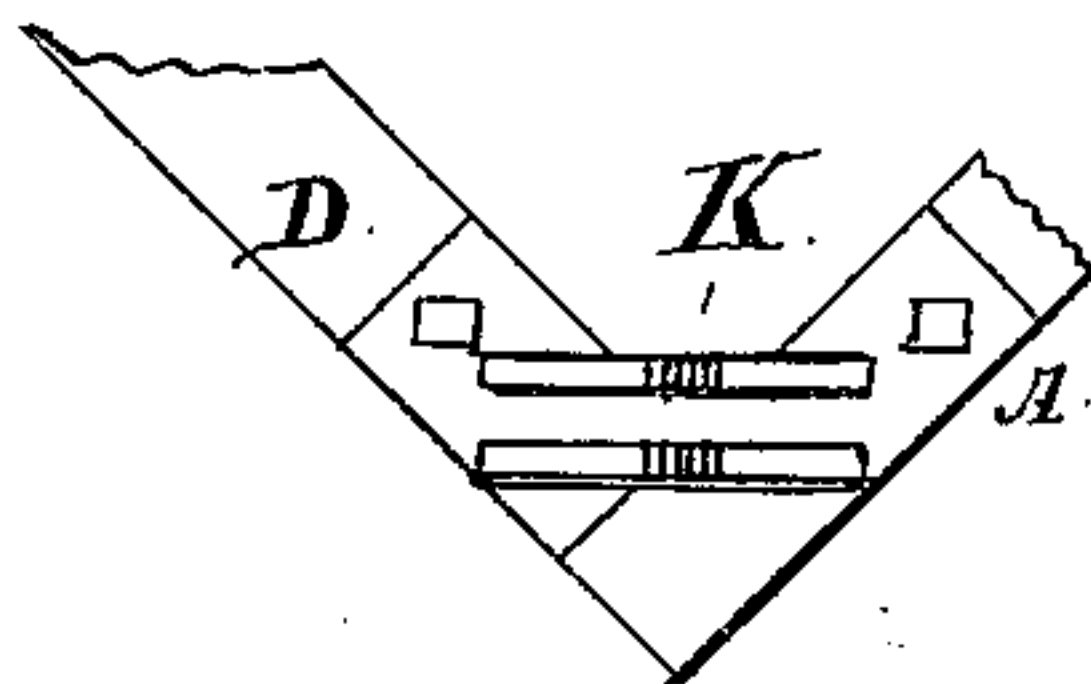


Fig. 8.

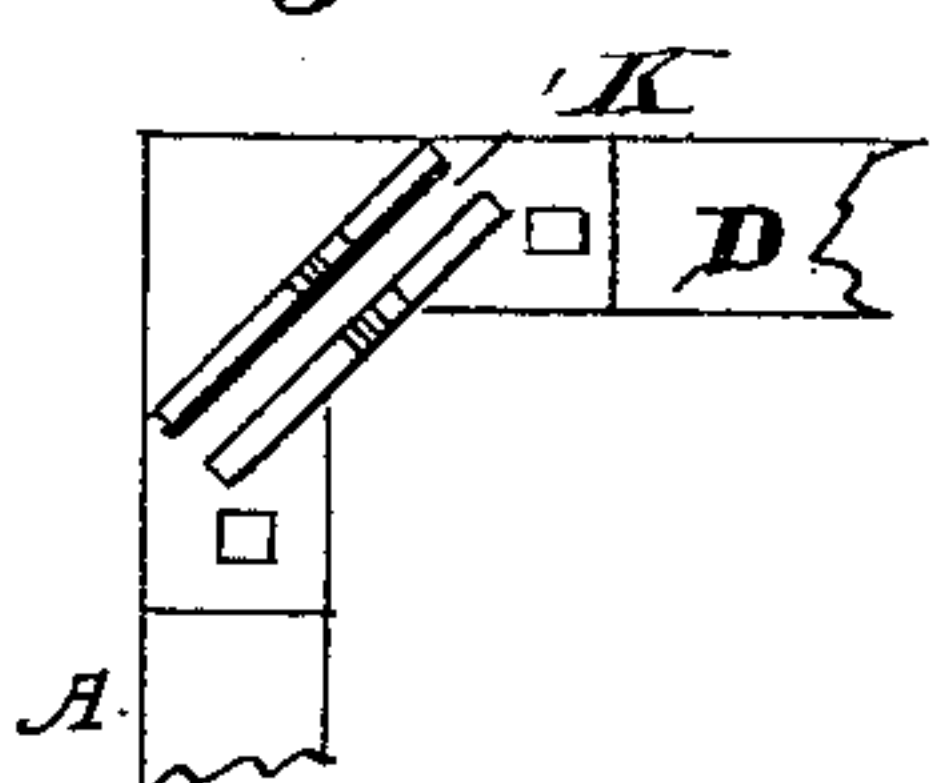


Fig. 10.

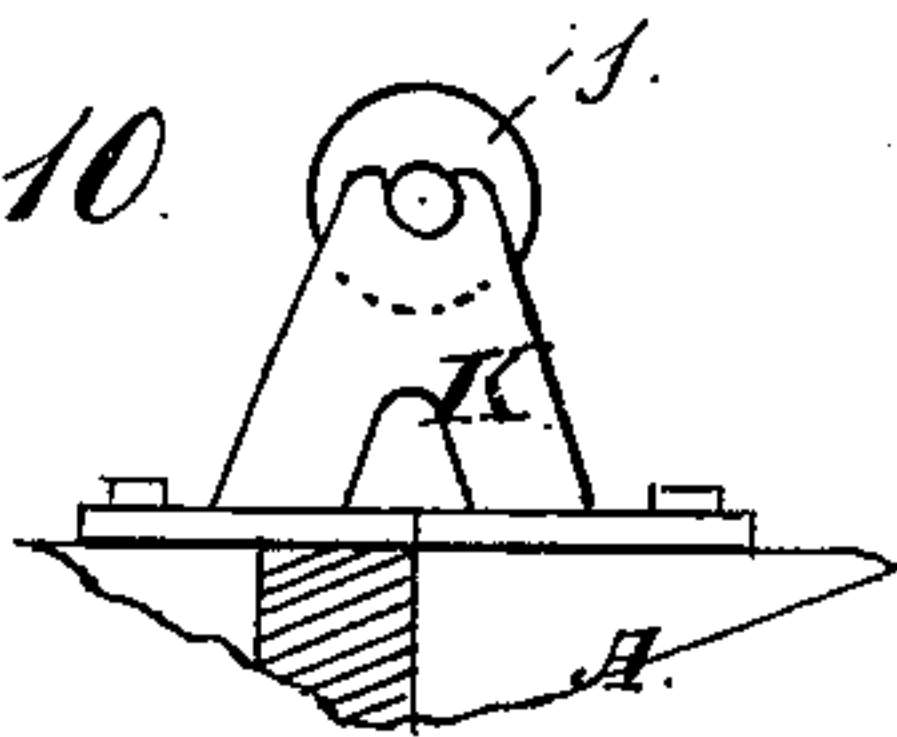
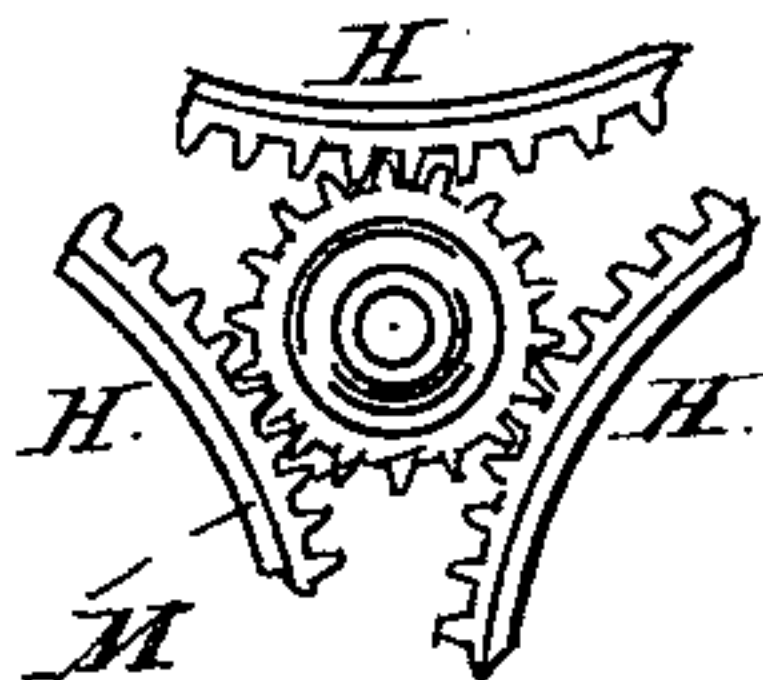


Fig. 11.



Witnesses:  
Albert H. Adams.  
Harry T. Jones.

Inventor:  
George K. Smith



# UNITED STATES PATENT OFFICE.

GEORGE K. SMITH, OF CHICAGO, ILLINOIS.

## GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 335,391, dated February 2, 1886.

Application filed October 13, 1885. Serial No. 179,780. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE K. SMITH, residing at Chicago, in the county of Cook and State of Illinois, and a citizen of the United States, have invented a new and useful Improvement in Grinding-Mills, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a plan of the mill. Fig. 2 is a side elevation, a portion of the box and frame on which the mill is mounted being cut away, also a portion of the master-wheel. Fig. 3 is a top view of the spider. Fig. 4 is a side elevation of the spider. Fig. 5 is a section of the meal-box at line *x* of Fig. 1, showing the mill in elevation. Fig. 6 is an enlarged detail of parts shown, and hereinafter more particularly specified. Fig. 7 is a side elevation of one of the spur-wheels with its pinion. Figs. 8, 9, 10, and 11 are details of parts shown, and hereinafter more particularly specified.

My invention consists in new devices for supporting and holding in place the master-wheel, whereby I reduce friction, and in certain new combinations, all as illustrated in the accompanying drawings, and herein described.

Those things which I claim as my invention will be pointed out in the claims.

In the drawings, A B represent two heavy pieces of plank or timber which form the sides of a box and frame upon which the mill is mounted. C D are the end pieces of such box or frame.

*a* are the rods. E is the bottom of the box. F is a casting, which may be called a "spider." It is secured at three points to the box or frame.

*b* are bosses, one on the upper side of each of the arms of the spider, which spider has a central hole, *c*, to receive the shaft which carries one of the grinding-disks.

*d* are pins secured in the spider F, one in each arm.

G is the master-wheel. It is provided with cogs on its inside, and has a projecting flange, *e*, at its top.

H are three spur-wheels, each of which is provided with a pinion, *f*, cast therewith, which pinions *f* engage with the gear upon the inside of the master-wheel, such spur-wheels and pinions being supported on the pins *d*.

I is a case in which the grinding-disks are located. Extending downward from this case are three arms, J, the lower ends of which are turned outward, and are secured to the pins *d* by means of nuts *g*. The ends of these arms rest on shoulders *h* on the pins *d*. Each of the arms is provided at its lower and outer end with a vertical roller, *i*, which rotates upon a pin secured to said arm J.

K are two castings bolted to the frame, and carrying at their upper ends rollers *j*, arranged to receive the flange *e*. *j'* is another roller supported by a bar, *n*. The master-wheel is supported by these rollers *j j'*.

L is the shaft which carries one of the grinding-disks.

M is a pinion on the shaft L, arranged to engage with the three spur-wheels H.

N is a bevel-wheel on the lower end of the shaft L, which wheel engages with a small bevel-wheel, O, upon a shaft, *l*, supported in bearings in the arms *k*, which project downward from the spider F.

P are devices which form a bearing for the shaft L. This construction is shown substantially in a former patent granted to me, and need not here be more fully described.

Q is a discharge spout, the delivery end of which is arranged between two of the spur-wheels H on the inside of the master-wheel. *m* is a projection on the top of the case to receive a hopper.

R are bars secured to the master-wheel, which bars form a sweep to which animal-power may be attached. One of the grinding-disks may be secured to the shaft L, and the other may be upon the inside of the top of the case, as is common, and the lower grinding-disk can be raised and lowered in any suitable manner. As shown, this can be done by raising and lowering the part P by means of an arm and screw-rod, substantially as shown in my former patent.

The bevel-wheels N O and shaft *l* are designed to be used to transmit power for use outside of the grinding-mill, as is customary.

The master-wheel in this present construction is supported upon the rollers *j j'* and revolves beneath the rollers *i*. The pinions *f* engage with the cogs on the inside of the master-wheel, and the spur-wheels H engage with the pinion M, and as the pinions *f* and spur-



wheels H are secured to each other the master-wheel is held in proper position laterally. As the master-wheel moves between the rollers *j j'*, upon which it rests, and the rollers *i*, which are above it, there can be no binding in use, and the wheel moves with very little friction. The pins *d* may be driven to place in the spider, or otherwise secured therein. By means of these pins and the nuts upon their upper ends the spider F and the arms J, which carry the case, are held together firmly, and as the arms J rest upon the shoulders *h* on the pins *d* they do not interfere with the free movement of the pinions *f* upon these pins *d*. Where the master-wheel is formed with arms, the material from the grinding-stones cannot be delivered as conveniently as where the construction herein described is used.

By dispensing with arms on the master-wheel and arranging spur-wheels, as indicated, the lower end of a discharge-spout is brought inside of the master-wheel and discharges the product of the mill into a box below the master-wheel and gearing. This feature is of considerable importance in actual use.

As shown, the lower end of the delivery-spout is located inside of the master-wheel and between two of the spur-wheels.

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

1. In a grinding-mill, the combination, with a main frame or spider, F, shaft L, and pinion *m*, of an internally-gearred open master-wheel, gears for transmitting motion from said wheel to said pinion, arms J, and a case, I, contain-

ing grinding-burrs and supported by said arms J centrally above said master-wheel, substantially as described.

2. In a grinding-mill, the combination of spider F, arms J, pins *d*, connecting said spider and arms, master-wheel G, shaft L, and pinion *m*, spur-wheels H, meshing with pinion *m*, pinions *f*, connected with said spur-wheels and engaging the master-wheel, and case I, supported on arms J and containing a stationary and a movable grinding-disk, substantially as described.

3. In a grinding-mill, the combination of master-wheel G, case I, containing a stationary and a movable grinding-disk, and arms J, having their lower ends turned outwardly and provided with rollers *i*, bearing against the master-wheel, and at their upper ends supporting the case I, substantially as described.

4. A grinding-mill comprising a master-wheel, arms J, a case, I, supported by said arms and containing a stationary and a movable grinding-disk, a shaft, L, provided with pinion *m*, spur-wheels H, meshing with said pinion, pinions *f*, connected with said spur-wheels and actuated from the master-wheel, and a delivery-spout leading from the case I down between two of the spur-wheels to discharge into a receptacle below the master-wheel, substantially as described.

GEORGE K. SMITH.

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ALBERT H. ADAMS,  
HARRY T. JONES.