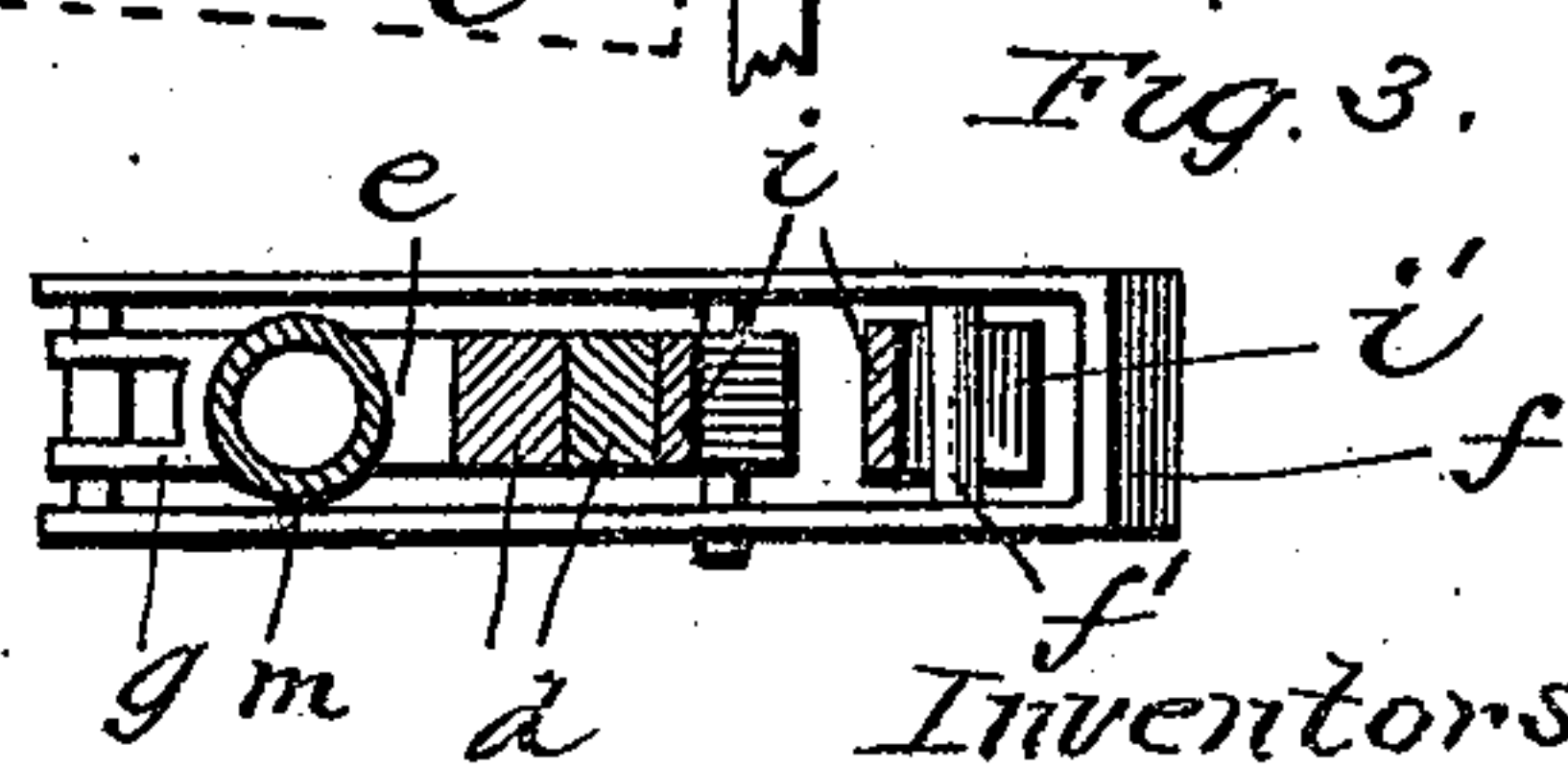
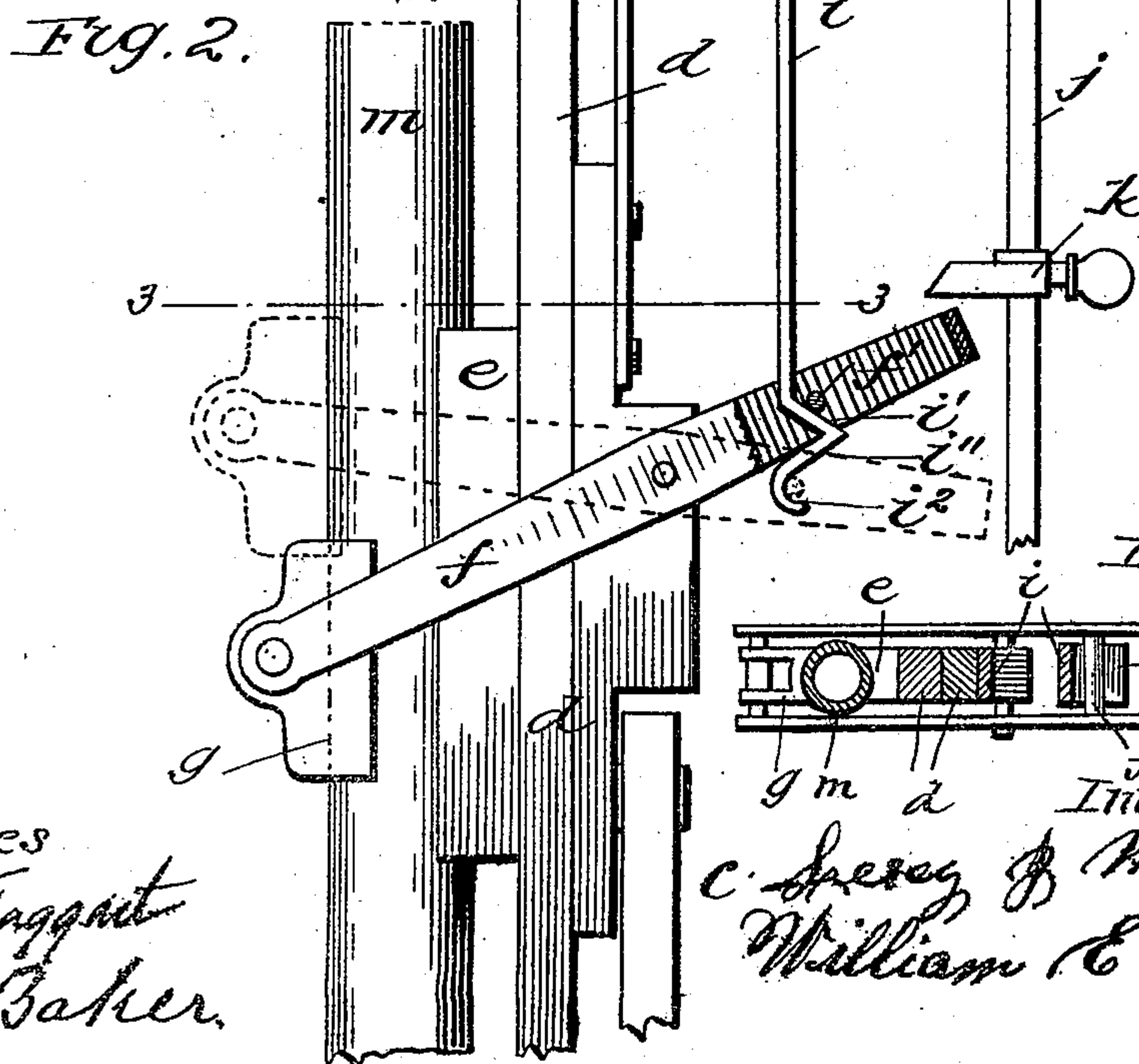
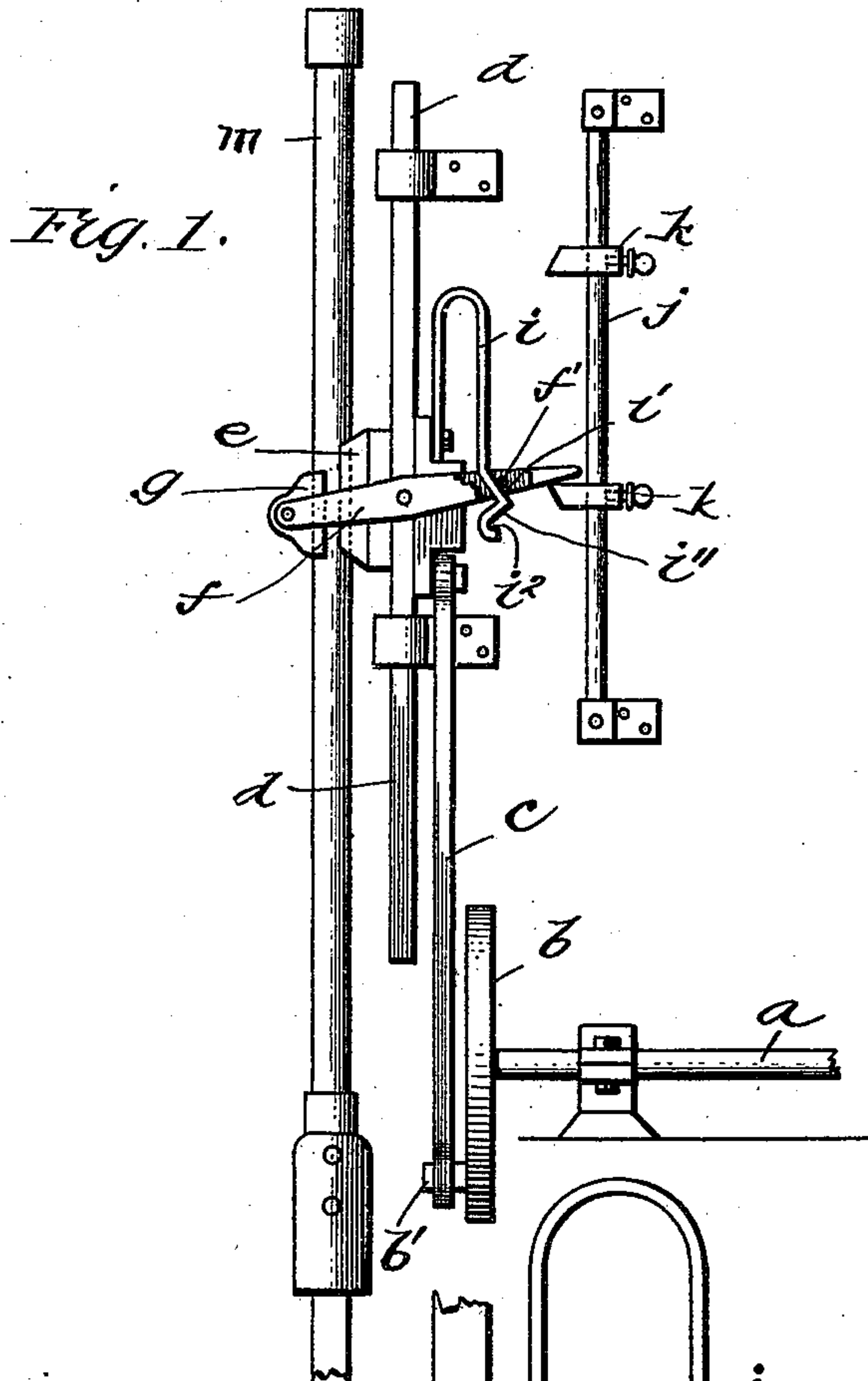


(No Model.)

L. J. MICHAELS & W. E. GREEN.
DRILLING MACHINE.

No. 510,039.

Patented Dec. 5, 1893.



Witnesses
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UNITED STATES PATENT OFFICE.

LEROY J. MICHAELS AND WILLIAM E. GREEN, OF TIFFIN, OHIO.

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 510,039, dated December 5, 1893.

Application filed July 10, 1893. Serial No. 480,101. (No model.)

To all whom it may concern:

Be it known that we, LEROY J. MICHAELS and WILLIAM E. GREEN, citizens of the United States, residing at Tiffin, in the county of Seneca and State of Ohio, have invented certain new and useful Improvements in Drilling-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a new and improved drilling machine, and it relates particularly to improvements in rock or well-drilling machines; and it consists in certain features of construction and combination of parts hereinafter described, and pointed out in the claims.

In the drawings:—Figure 1 is a side elevation of the machine. Fig. 2 is an enlarged side-elevation of a portion thereof; and Fig. 3 is a horizontal cross section on line 3—3 of Fig. 2.

Referring to the various parts by letters, *a* designates the driving-shaft; *b* the disk mounted on one end thereof and carrying crank-pin *b'*; *c* the pitman connected to the crank-pin and to the vertically reciprocating bar *d*, said bar being guided in its movements by suitable guides carried by the framing of the machine; *e* a rigid shoe secured on the forward side of the bar *d* at about the middle thereof, its forward face being concaved to receive the drill-rod *m*; *f* a bifurcated lever pivoted on the reciprocating bar *d* adjacent the middle of the shoe *e*, one of its members extending on each side of the rod *d*, shoe *e*, and the drill-rod as shown in Fig. 3; *g* a shoe pivoted between the forward ends of the members of the lever *f*, its rear face being concaved to receive the drill rod and grasp it securely in operation; *i* a strong leaf spring of U-shape, secured at one of its ends to the bar *d* on the rear side thereof, its other end extending down between the members of the lever *f*, on the rear side of the bar *d*, and being formed with the inclined portions *i'*, *i''*, the lower end of the inclined portion *i''* terminating in a hook *i²*; *f'* a cross-bar or pin carried by the lever *f* and bearing alternately on the inclined portions of the spring *i* as will be more fully hereinafter set forth; *j* a stationary vertical rod supported in any suitable manner in the frame of the machine ad-

jacent the rear end of the lever *f*; *k*, *k* adjustable tappets carried by this rod, and adapted to be engaged by the rear end of the lever *f* when the bar *d* is near the end of its upward and downward strokes.

The operation is as follows:—Power is applied to the shaft *a* in any suitable manner, and the bar *d* reciprocated by the mechanism described. Referring to Fig. 1 it will be observed that the bar *d* is at the lower end of its down stroke and the rear end of lever *f* has engaged the lower tappet *k* causing the forward end of said lever to move downwardly thereby clamping the drill-rod between the shoes *g* and *e*. The pin *f'* now bears on the inclined surface *i'* of the spring *i*, and the tension of said spring holds it in this position, thus securely holding the drill-rod grasped between the shoes. The friction of the drill-rod aids in holding said rod between the shoes as friction against said shoe tends to cause lever *f* to swing down at its forward end, which motion will cause the shoe to more securely bind against the drill-rod, as is evident from the location of the fulcrum of the lever. The bar *d* now moves upwardly and when near the end of its up stroke the lever *f* strikes the upper tappet *k*, which moves the rear end of the lever downwardly, causing pin *f* to move downwardly from the incline *i* on to incline *i''* and to come to rest in hook *i²* as shown in dotted lines in Fig. 2. This motion of the lever *f* raises its forward end and releases the drill-rod and permits it to fall. The bar *d* and its attached parts make the down stroke in this position until the lever *f* strikes the lower tappet *k*, when the foregoing operation is repeated.

Having thus fully described our invention, what we claim is—

1. In a drilling-machine, the combination of a supporting-frame, a reciprocating-bar and means for reciprocating it, a shoe carried by the bar, a forwardly-extending lever carried by the reciprocating-rod, a movable shoe carried at the forward end of the lever, a pin carried by the lever, a yielding part normally pressing against said pin and provided with oppositely-inclined bearing-faces *i'* *i''* adapted to alternately engage said pin, and adjustable tappets adapted to engage said lever, substantially as described.

2. In a drilling-machine, the combination
of a supporting-frame, a reciprocating-bar, a
shoe thereon, a bifurcated lever pivoted on
said rod and embracing the same and extend-
5 ing forwardly, a shoe pivoted between the
forward ends of the lever, a pin carried by
the rear end of the lever, tappets adapted to
alternately strike the rear end of the lever,
and a leaf-spring secured to the reciprocating
10 rod and having its free end bent into oppo-

sitely inclined faces i' i'' , these faces being
adapted to alternately engage said pin, sub-
stantially as described.

In testimony whereof we affix our signatures
in presence of two witnesses.

LEROY J. MICHAELS.
WILLIAM E. GREEN.

Witnesses:

HARRY TAGGART,
W. S. WAGNER.