

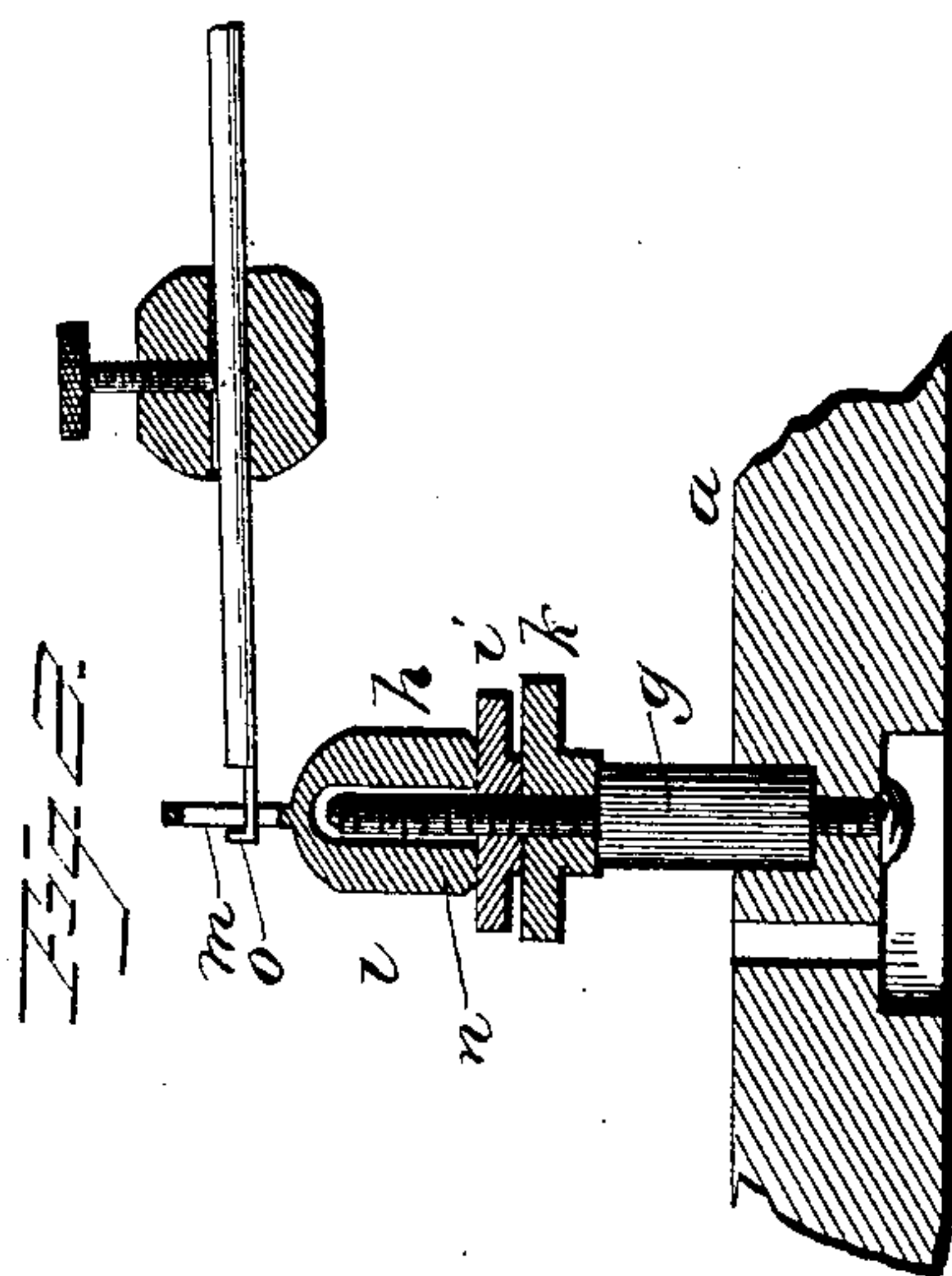
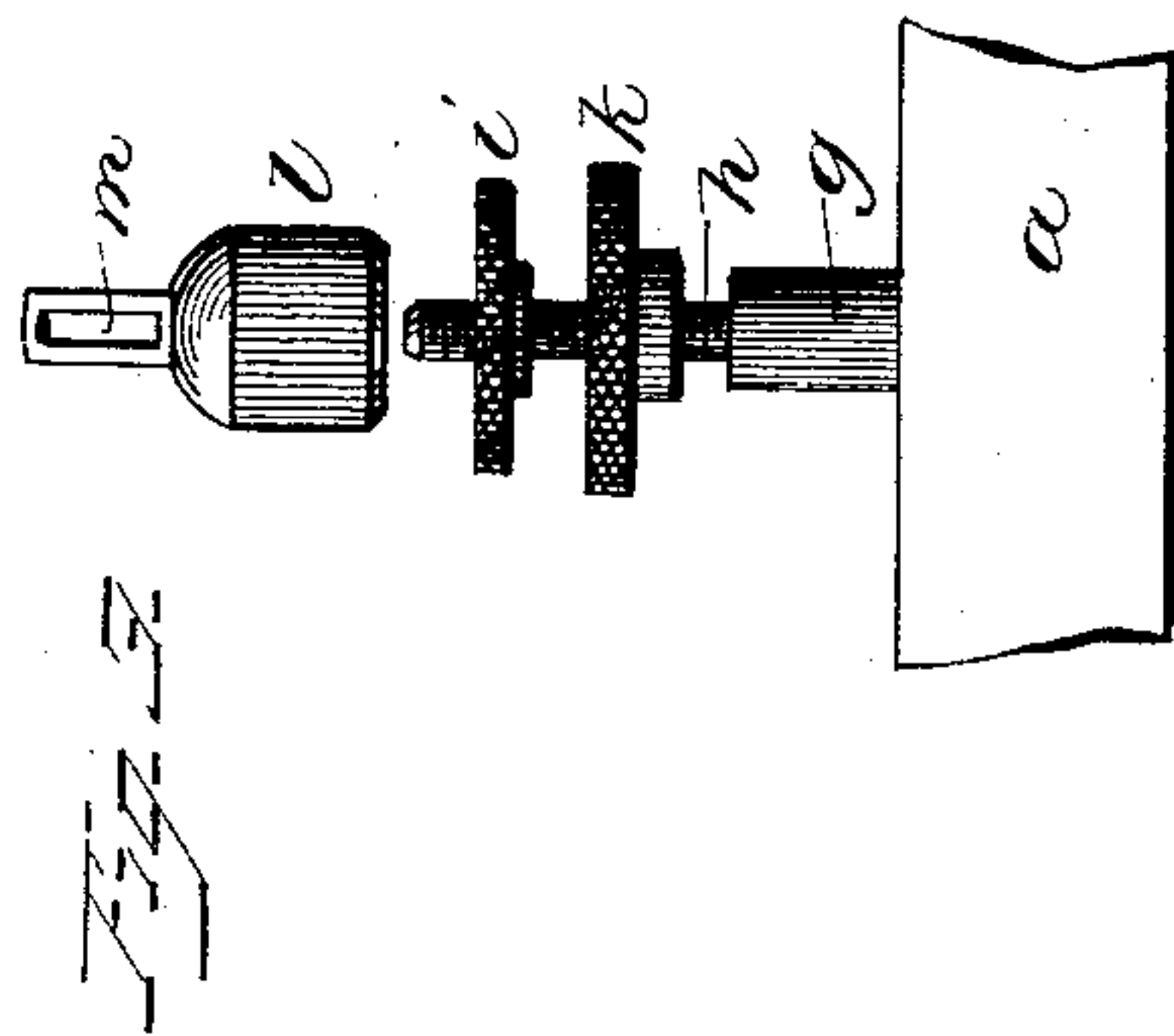
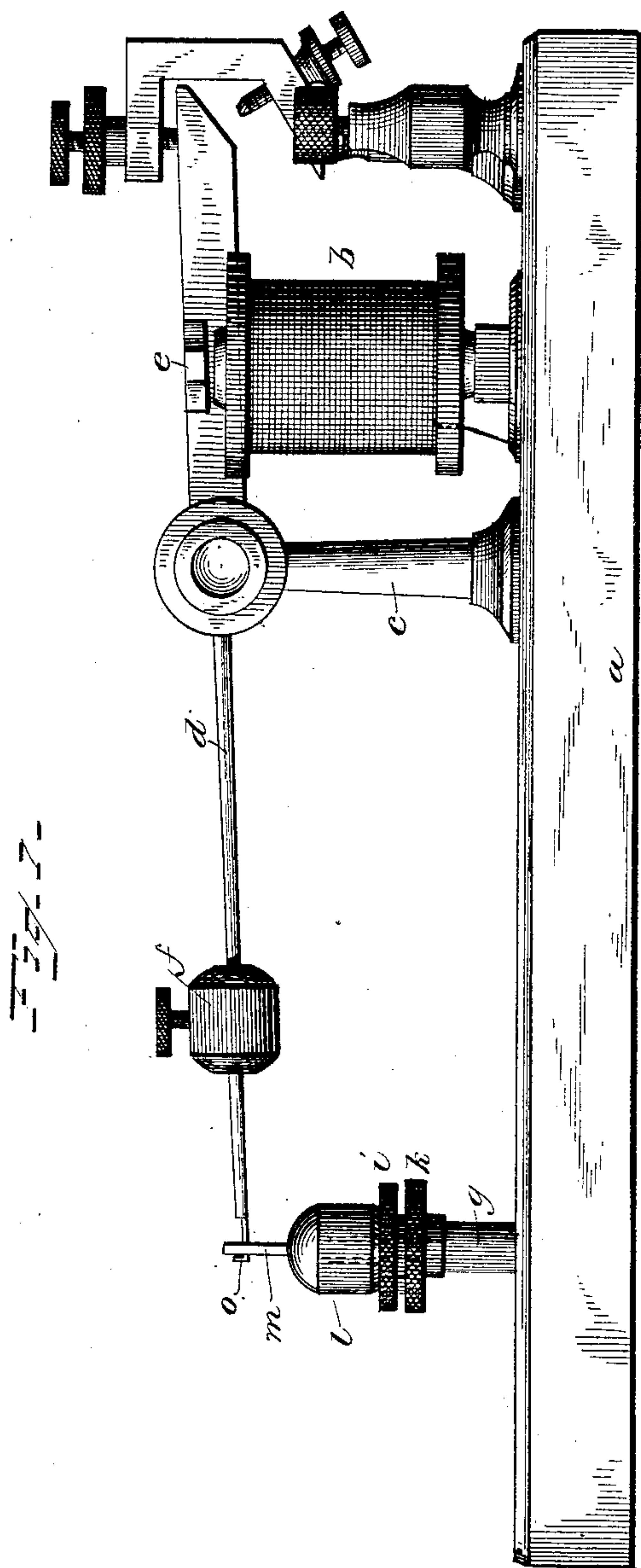
(No Model.)

F. STITZEL & C. WEINEDEL.

TELEGRAPHIC RELAY.

No. 315,568.

Patented Apr. 14, 1885.



WITNESSES

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UNITED STATES PATENT OFFICE.

FREDERICK STITZEL AND CHARLES WEINEDEL, OF LOUISVILLE, KENTUCKY.

TELEGRAPHIC RELAY.

SPECIFICATION forming part of Letters Patent No. 315,568, dated April 14, 1885.

Application filed May 17, 1884. (No model.)

To all whom it may concern:

Be it known that we, FREDERICK STITZEL and CHARLES WEINEDEL, both citizens of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Telegraph-Relays, of which the following is a full, clear, and exact description.

In telegraph-relays and other electrical instruments where an electro-magnet and vibrating armature are employed the core or cores of the magnet from constant use oftentimes become residually magnetized—that is to say, the core remains a magnet after the electric current has ceased to pass through the coil. This residual magnetism of course attracts the armature, or causes what is termed in telegraphy “sticking” of the armature. This sticking prevents the correct transmission of messages, if not entirely precluding transmission. A means has been designed for overcoming this difficulty, consisting of an auxiliary spring operated by an additional electric circuit including an electro-magnet; but said spring was not made to act with its additional force until the relay-armature had reached the limit of its movement to the electro-magnet. Consequently the said armature was brought with too much violence against said magnet.

Our invention consists in the combination, with the armature-lever provided with the usual adjustable weight, of an auxiliary weight constructed and operating as hereinafter more particularly described and claimed. This auxiliary weight is taken up after the armature has started to or when it is nearing the maximum attractive force of the electro-magnet.

We have illustrated in the accompanying sheet of drawings one way of using our invention on a telegraph-relay.

Figure 1 represents a side elevation of the instrument with our invention added. Fig. 2 is a longitudinal sectional detail showing the auxiliary weight and the means for adjusting it. Fig. 3 is a detail in end elevation of the auxiliary weight and the means for adjusting it ready to be put together.

In the several figures like parts are indicated by similar letters of reference, and the letter *a* designates any suitable base, upon

which are mounted in any suitable manner the electro-magnet *b* and the posts *c*, forming the support of the armature-lever *d*. 55

Upon one arm of the lever *d* is the armature *e*, and on the other an adjustable weight, *f*.

On the base *a*, in the plane of the end of lever *d*, is mounted a post, *g*, having the screw-threaded portion *h* and the binding-nuts *i* and *k* thereon. 60

l is the auxiliary weight having at its top a slotted projection, *m*, to permit travel of the lever *d* before it is time for the weight to act. This weight is also recessed at *n* about centrally of its length and vertically, to fit down over and be guided by the upper or screw-threaded end of the post *g*. 65

Through the slotted projection *m* of the auxiliary weight, the hooked end *o* of the armature-lever *d* extends. 70

The operation of our invention is as follows: Suppose the magnets of an ordinary relay are energized by a strong current, then the ordinary weight on the armature is adjusted so as to promptly return the same and overcome all reasonably possible residual magnetism when the circuit is broken. If, however, the current be weak, the magnets cannot attract the armature, because the weight is too great to be overcome by the current. Now, if this weight be divided and properly proportioned, as hereinbefore set forth, the minimum attractive force of the magnet energized by a weak current will attract the armature, notwithstanding the weight *f* secured to the lever of said armature, and permit the maximum attractive force of the magnet to overcome the auxiliary weight. This same auxiliary weight may be adjusted for the strong current. 85

In our invention the armature is adjusted by the weight *f*, so that the magnets *b* energized by a weak current will attract it, and the auxiliary weight *l* is adjusted by means of the nuts *te* to allow the lever to lift or take up the weight after the armature has started for the energized electro-magnet and is near the maximum attractive force of the same. Upon breaking the current in the coil, the auxiliary weight will help the armature to recede from the magnets. This, it will be seen, permits the prompt attracting and retracting movements of the armature (which are essential to the proper working of the relay) without 95 100

readjustment of weight *f* and weight *l*, since an electro-magnet, energized by a weak current, will near its maximum attractive force exert enough power to raise a weight sufficiently heavy to overcome any residual magnetism, should said current change from a weak to a strong one.

An arrangement has been patented for use in automatic telegraphs in which a spring-switch is employed, operated by the armature at the receiving-station, when the current is made, to cut out a portion of the working battery. When the circuit is broken in this case, the armature is retracted by a spring, and a spring-switch of the character referred to is usually too feeble to afford any assistance in retracting the armature, its spring being used solely to bring it back into position after the armature is retracted.

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

1. The combination, in a relay, of the electro-magnet, the pivoted armature-lever *d*, provided with an adjustable weight, *f*, and a mechanical auxiliary to said weight normally disconnected from the armature-lever and

taken up by said armature-lever while it is approaching the energized magnet for use in retracting the same when the circuit is broken, as set forth.

2. The combination, in a relay, of the electro-magnet, the pivoted armature-lever *d*, provided with an adjustable auxiliary weight, *l*, normally disconnected from and adapted to be taken up while the armature is approaching said magnet to assist in retracting the armature, as set forth.

3. The combination, in a relay, of the electro-magnet, the pivoted armature-lever *d*, having the hooked end *o*, and provided with the adjustable weight *f*, the auxiliary weight *l*, having the slotted projection *m*, to engage the said hooked end, and the post *g*, having the adjustable nuts *i* and *k* thereon, all substantially as and for the purpose set forth.

In testimony whereof we have hereunto set our hands this 14th day of May, A. D. 1884.

FREDERICK STITZEL.
CHARLES WEINEDEL.

Witnesses:

C. LOUIS KRIEGER,
M. S. SMITH.