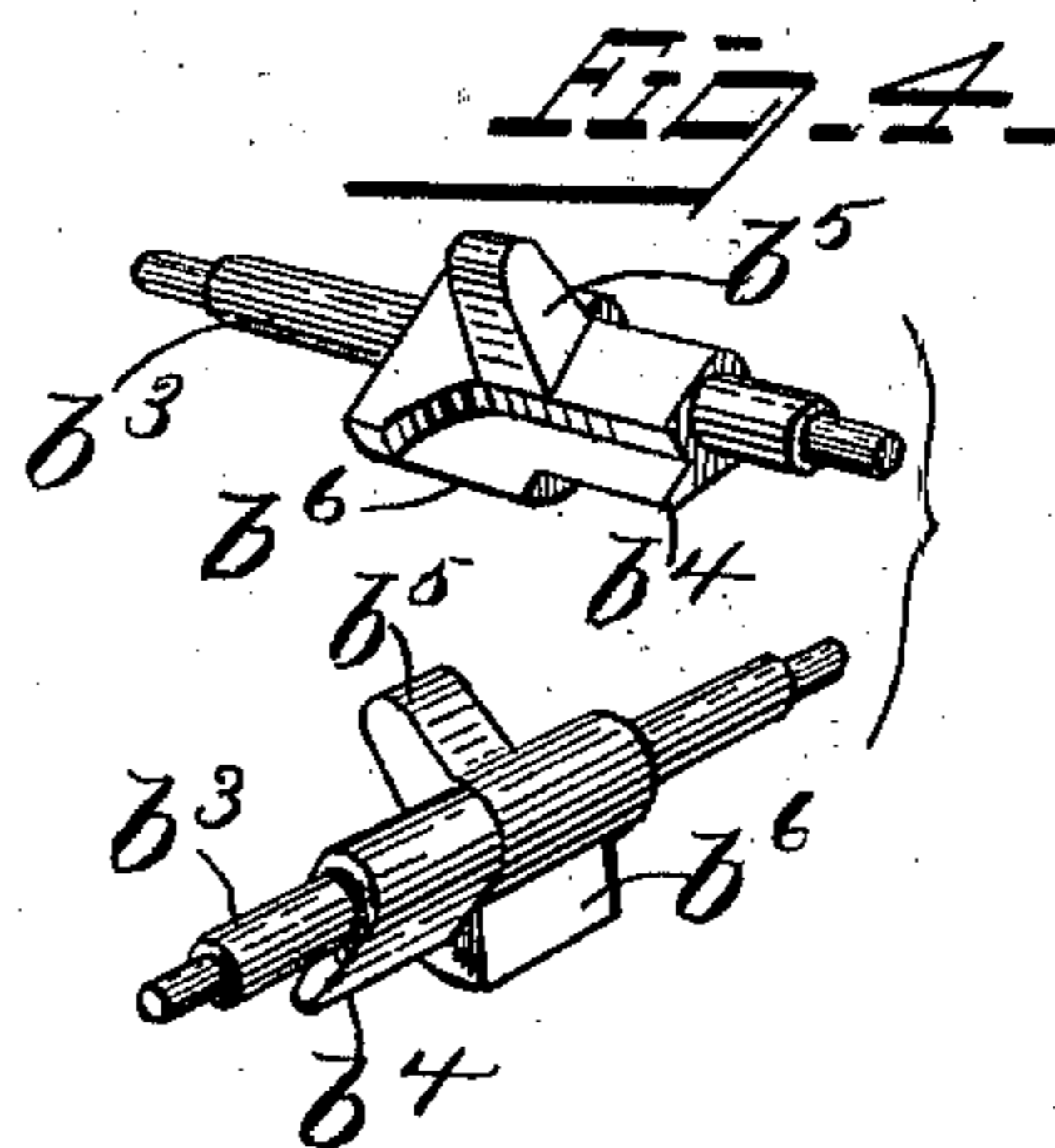
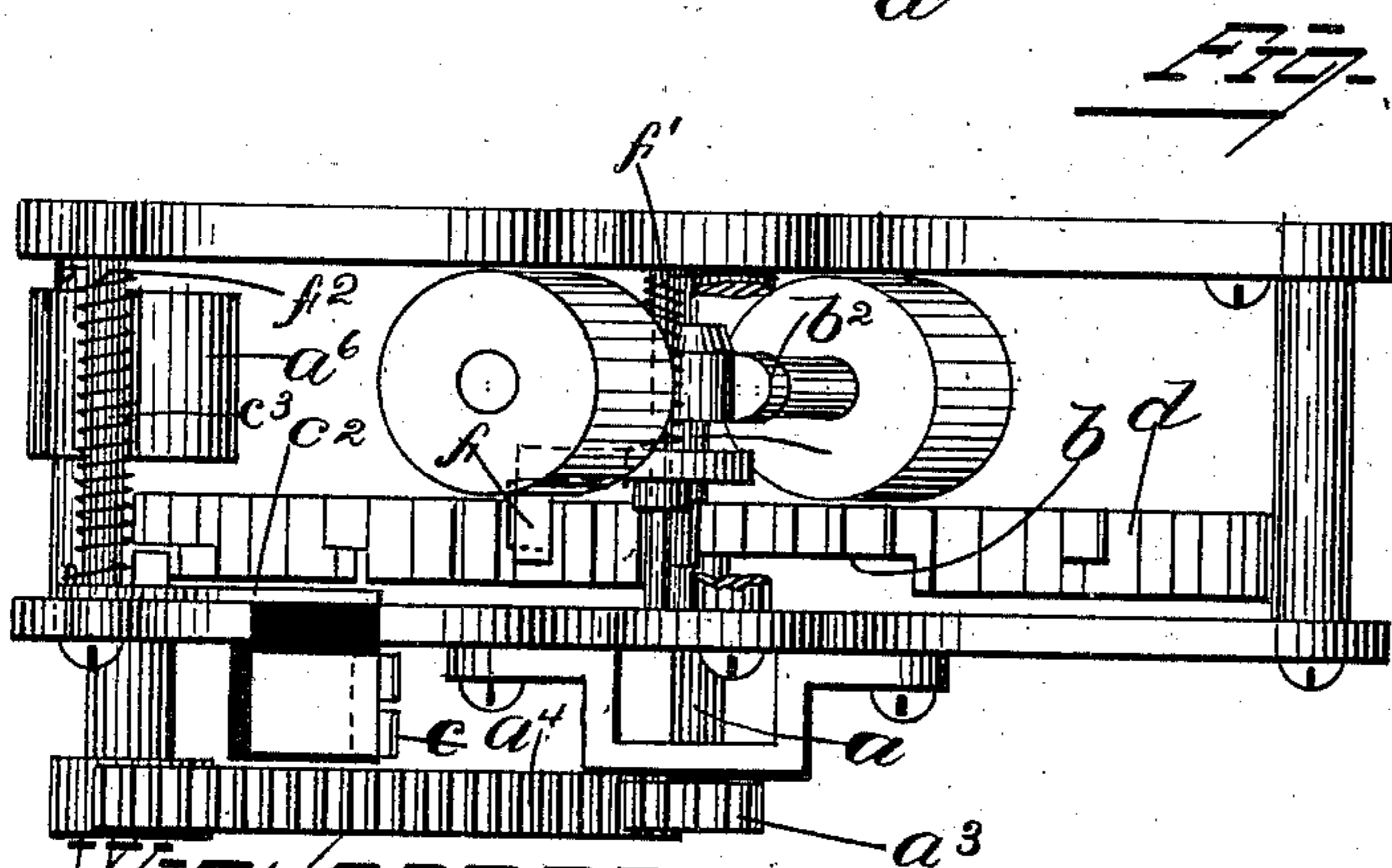
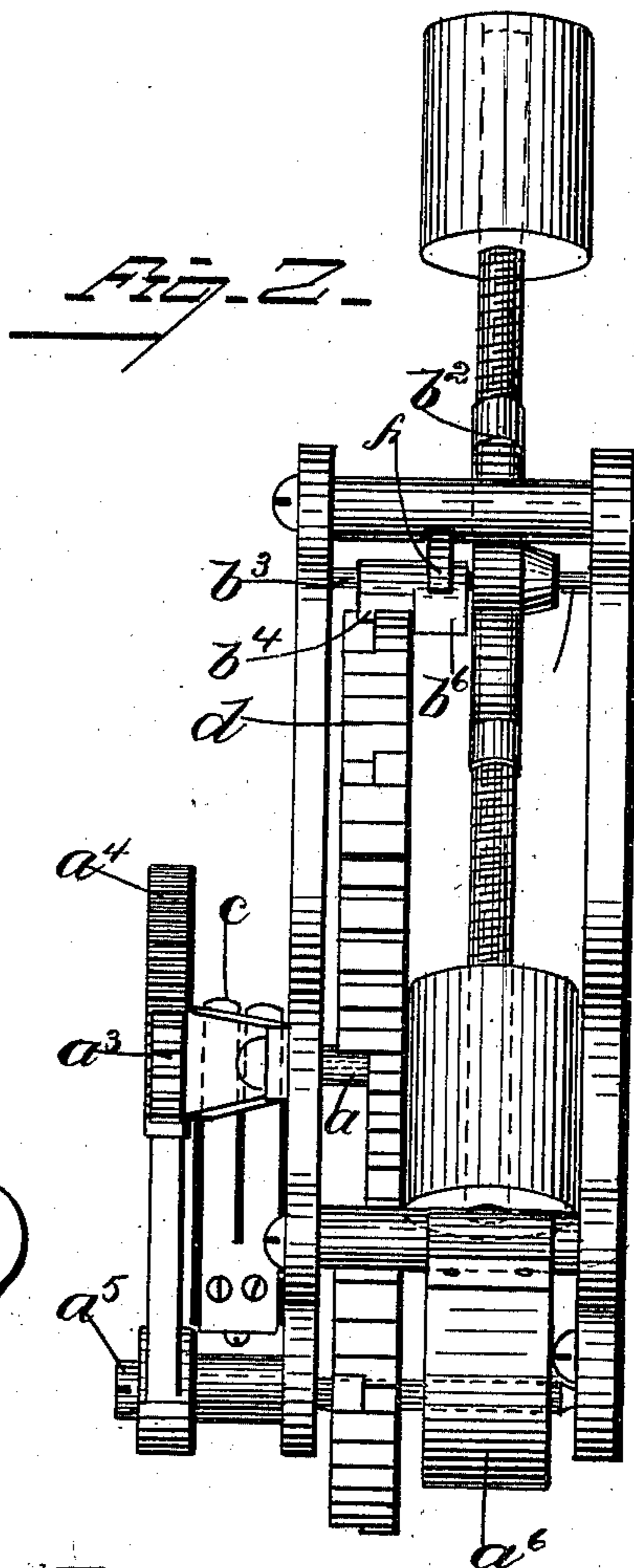


Patented June 2, 1896.



Th. H. Davis  
Charles D. Crocker.

INVENTOR  
John J. Ruddick  
by B. J. Bay, atty

# UNITED STATES PATENT OFFICE.

JOHN J. RUDDICK, OF NEWTON, MASSACHUSETTS.

## SIGNAL-BOX.

SPECIFICATION forming part of Letters Patent No. 561,526, dated June 2, 1896.

Application filed October 9, 1895. Serial No. 565,098. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN J. RUDDICK, of Newton, county of Middlesex, State of Massachusetts, have invented an Improvement in Signal-Boxes, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

In another application filed by me, Serial No. 563,052, a signal-box is shown wherein the circuit-breaker is operated in unison with the intermittent action of the motor-driven escape-wheel, which is governed by a suitable pallet.

In some instances it is necessary that the signal should be transmitted very slow, much slower than if the escape-wheel should be governed by any ordinary pallet, and this invention has for its object to provide governing devices for the escape-wheel which are constructed and arranged to retard the action of the escape-wheel sufficiently to enable the signal to be thus slowly transmitted.

In accordance with this invention a counterbalanced arm is secured to an oscillating arbor and two single-toothed pallets are provided for the escape-wheel, one of which is mounted upon an independent arbor and held pressed by a suitable spring into engagement with the escape-teeth and the other of which is rigidly secured to the arbor carrying the counterbalanced arm, and the latter arbor also has a projection adapted to raise the spring-pressed pallet out of engagement with the escape-wheel, said projection and pallet being arranged on the arbor carrying the counterbalanced arm in such relation to each other that the pallet engages the escape-teeth just as the projection lifts the spring-pressed pallet out of engagement with said teeth.

The counterbalanced arm receives its impulse from the motor-driven escape-wheel engaging and moving the pallet on the arbor carrying the counterbalanced arm. The arbor carrying the counterbalanced arm has also another projection, which serves as a stop or abutment against which a projection on the spring-pressed pallet will strike if for any reason said spring-pressed pallet should not act when it is released or permitted to act, to thereby prevent the escape-wheel slipping beneath the pallets.

Figure 1 shows in front elevation the signaling mechanism of a signal-box provided with an escapement embodying this invention; Fig. 2, a side view of the same; Fig. 3, a plan view of the same, and Fig. 4 details to be referred to.

The main shaft *a* has secured to it a ratchet-wheel *a'*, which engages a pawl *a''*, (see dotted lines, Fig. 1,) carried by a large escape-wheel *b*, mounted upon said main shaft. A pinion *a'''* is secured to said shaft *a*, which is engaged by a sector *a''''*, secured to an arbor *a''''''*, having its bearings in the frame, and a spring *a''''''''* is coiled about said arbor *a''''''*, one end of which is connected thereto and the other end of which is connected to a fixed part of the frame. This sector is adapted to be operated by a pull in any usual or suitable manner to wind the spring *a''''''* and thereafter turn the escape-wheel *b* by means of the intermediate connection of the pawl and ratchet; but so far as my invention is concerned the escape-wheel may be driven in any other suitable way.

The large escape-wheel *b* has upon its side or face the signal pins or teeth *b'*, which are disposed in groups varying according to the number of the box, and a circuit-breaking lever *c''*, pivoted to the frame at *c'''*, lies in the path of movement of these signal-pins to be operated by them as the wheel revolves to open and close the circuit by disengaging and engaging the contact-pin *c*.

The signal-pins are located in such manner that the circuit-breaking lever is operated in unison with the intermittent movement of the escape-wheel *b*. The escape-wheel is adapted to make a complete revolution each time it is operated.

The governing device for the escape-wheel, which forms the essential feature of this invention, will now be described.

A counterbalanced arm *b''* is secured to an arbor *b'''*, said arm having weights made adjustable upon its ends. A pallet or tooth *b''''* projects from said arbor, being rigidly secured thereto, which is adapted to engage the teeth of the escape-wheel *b*, and another pallet *f* is loosely mounted upon an independent arbor *f'*, which is held pressed into engagement with the teeth of the escape-wheel by a spring *f''*, herein represented as encircling the arbor. The spring-pressed pallet has an engaging

portion  $f^2$ , which is engaged by a projection  $b^5$  on the arbor  $b^3$ , acting to lift said pallet out of engagement with the escape-teeth of the wheel  $b$ . The projection  $b^5$ , which lifts the spring-pressed pallet, is arranged on the arbor  $b^3$  in such relation to the pallet  $b^4$  thereon that as said pallet  $b^4$  engages the teeth of the escape-wheel the pallet  $f$  is raised. The counterbalanced arm receives its impulse from the motor-driven escape-wheel  $b$ , acting upon the pallet  $b^4$ . The arbor  $b^3$  has a projection  $b^6$ , which passes beneath a projection  $f^3$  on the pallet  $f$  when the pallet  $b^4$  is out of engagement with the wheel, preventing the spring-pressed pallet from accidentally engaging the wheel and, furthermore, causing it to act if for any reason it fails. As the counterbalanced arm is somewhat ponderous, movement of the pallet is necessarily very slow.

I claim—

1. The combination with an escape-wheel, of a counterbalanced arm  $b^2$ , its arbor  $b^3$ , pallet  $b^4$  on said arbor, spring-pressed pallet  $f$  on an independent arbor, projection  $b^5$  on the arbor  $b^3$  for lifting said spring-pressed pallet and adapted to act thereon when the pallet  $b^4$  engages the escape-wheel, the counterbalanced arm thereby receiving its impulse by the escape-wheel acting upon said pallet  $b^4$ , substantially as described.

2. The combination with an escape-wheel,

of a counterbalanced arm  $b^2$ , its arbor  $b^3$ , pallet  $b^4$  on said arbor, spring-pressed pallet  $f$  on an independent arbor, projection  $b^5$  on the arbor  $b^3$  for lifting said spring-pressed pallet and adapted to act thereon when the pallet  $b^4$  engages the escape-wheel, the counterbalanced arm thereby receiving its impulse by the escape-wheel acting upon said pallet  $b^4$ , and a stop  $b^6$  on the arbor  $b^3$  which coöperates with a projection  $f^3$  on the spring-pressed pallet, substantially as described.

3. The combination of a motor-driven escape-wheel constructed and arranged to actuate a circuit-breaking lever, and a governing device for said escape-wheel comprising the counterbalanced arm  $b^2$ , its arbor  $b^3$ , pallet  $b^4$  on said arbor, spring-pressed pallet  $f$  on an independent arbor, projection  $b^5$  on the arbor  $b^3$  for lifting said spring-pressed pallet and adapted to act thereon when the pallet  $b^4$  engages the escape-wheel, the counterbalanced arm thereby receiving its impulse by the escape-wheel acting upon said pallet  $b^4$ , substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN J. RUDDICK.

Witnesses:

B. J. NOYES,  
F. H. DAVIS.