No. 610,047. Patented Aug. 30, 1898.

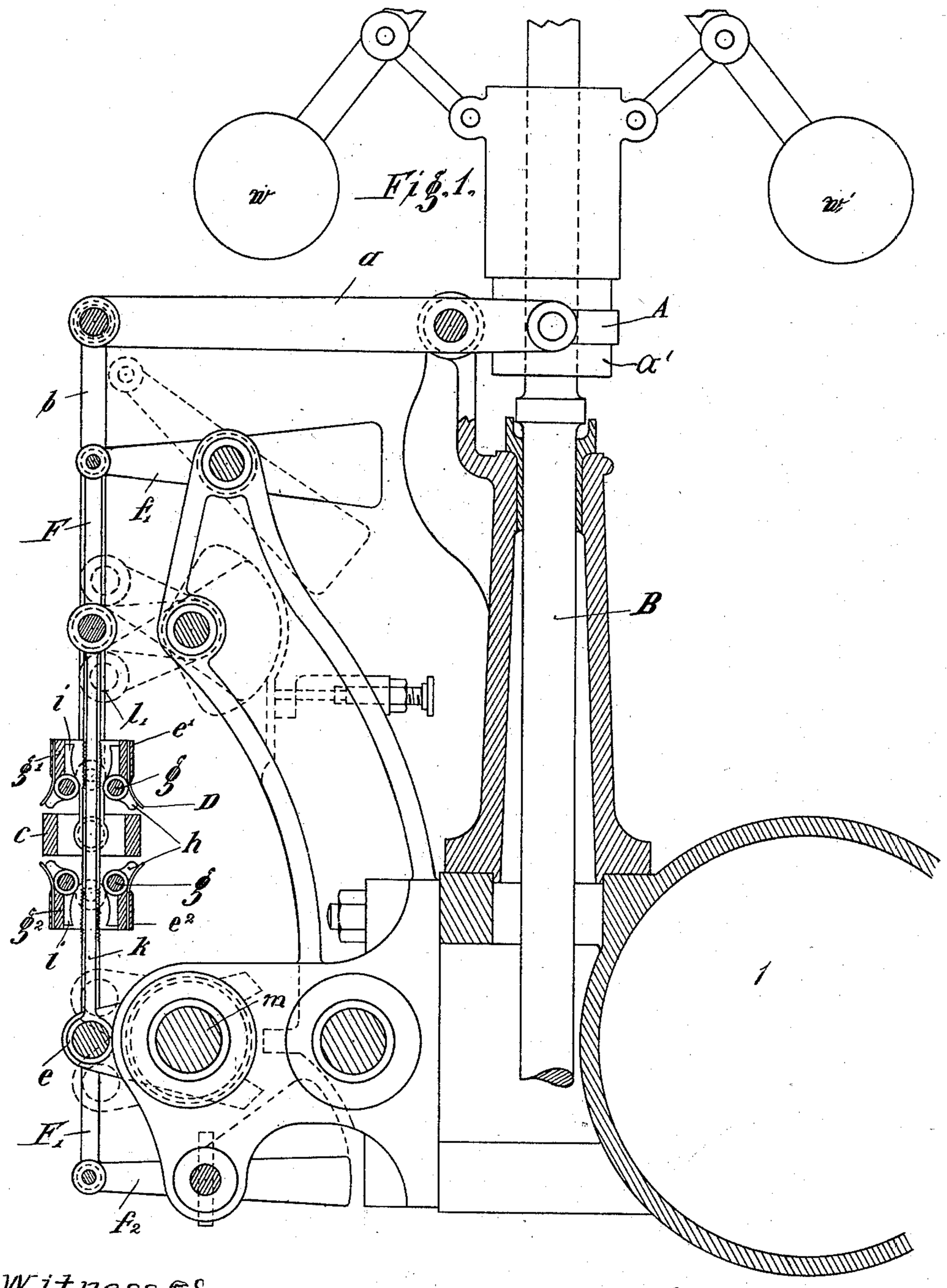
M. HANNER.

CUT-OFF VALVE REGULATING MECHANISM.

(Application filed July 22, 1896.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



Witnesses
W. V. Bidgood
H. P. Hammond

Inventor:
Martin Hanner
By Knight Bros
Attys.

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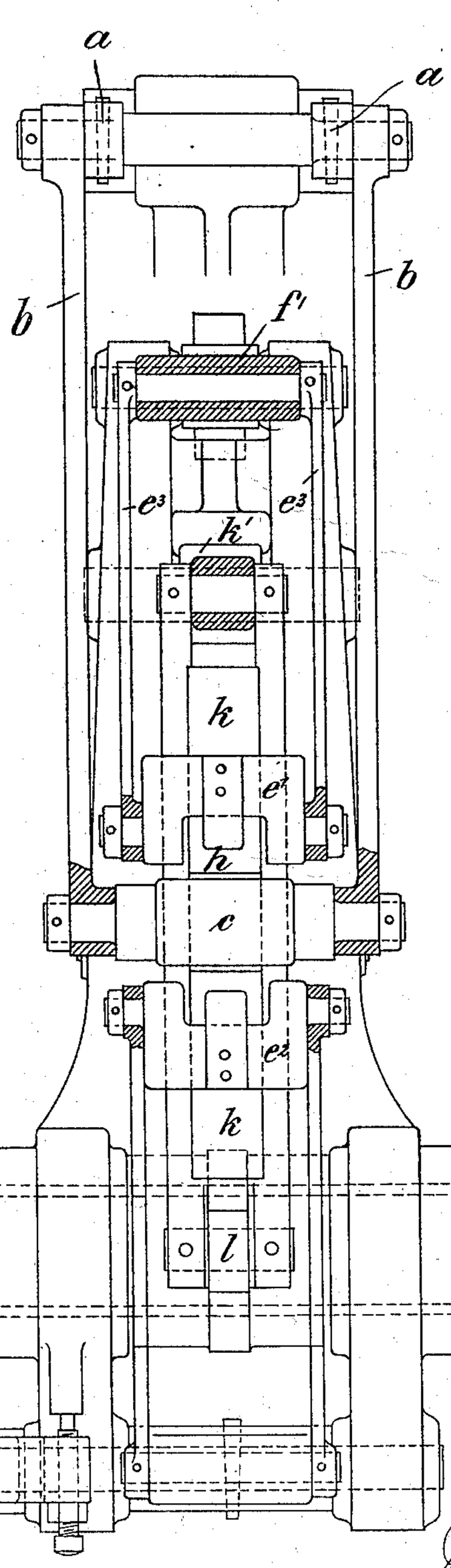

Fig. 2.

Witnesses
M. V. Bridgid
A. P. Hammond

Inventor
Martin Hanner
By [illegible]
Attys.

UNITED STATES PATENT OFFICE.

MARTIN HANNER, OF DUISBURG, GERMANY.

CUT-OFF-VALVE-REGULATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 610,047, dated August 30, 1898.

Application filed July 22, 1896. Serial No. 600,116. (No model.)

To all whom it may concern:

Be it known that I, MARTIN HANNER, a subject of the King of Prussia, German Emperor, residing at Duisburg, Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Cut-Off-Valve-Regulating Mechanism, of which the following is a specification.

My invention relates to mechanism for regulating or adjusting the position of cut-off valves in order to insure the automatic regulation of the cut-off and of the corresponding steam expansion in accordance with the power required of the engine.

My invention is especially adapted for and is here shown in two different forms in connection with Rider valve mechanism; but it is also adapted for use on various kinds of slide and rocking valve mechanism.

The invention consists, briefly, in mechanism hereinafter fully described, and the novelty of which is indicated in the claims, for automatically shifting the cut-off valve by connection with the engine-governor to the point required by the work at the time being done by the engine, the valve being lifted at the point to which it is set and the shifting mechanism being automatically returned to normal position in readiness to be operated to again shift the valve in either direction when further change takes place in the work being done by the engine.

In the accompanying drawings, Figure 1 shows in sectional elevation one form of my improvement with such parts of the engine as are necessary to enable the comprehension of the invention. Fig. 2 is an elevation at right angles to Fig. 1.

My invention is here shown as applied to that class of steam-engines having what is known as the "Rider" valve-gear, wherein the admission of steam is controlled by the governor through the agency of an expansion-valve having oblique ports whose extent of opening is determined by the angular position of the expansion-valve rod.

The engine *l* may be of the represented or other type having the cut-off-lever regulator *a* pivoted to a fixed support on the frame of the engine and connected to a collar *a'*, which is raised and lowered by the engine-governor. (Not shown.) The lever *a* is also connected by rods *b* to frame or slide *c*, which is accordingly raised or lowered in accordance with the separation of the balls of the governor caused by changes of speed. Above and below the frame *c* collars or boxes e' e^2 are located, each connected by rods e^3 with arms f' f^2, respectively, so weighted that the box e' is normally maintained in its lowermost position and the box e^2 in its uppermost position. Pivoted in the boxes e' e^2 are angle-levers or detents *i*, normally held by pressure of springs *i'* outward against the walls of the boxes. Small arms *h* on said detents are arranged in the path of the frame *c*. The toothed bar *k*, pivoted to the arm *l* of the cut-off or expansion slide, passes through the frame *c* and the boxes e' e^2 and is counterweighted at *k'* and held movably to any position to which it is set by an adjustable spring k^2, bearing against the heel of the counterweight arm *k'*.

It will now be seen that when by the action of the governor the frame *c* is shifted from its normal central position upward or downward the said frame strikes against the arms *h* of the detents *i*. The resistance of the weights f' f^2 is sufficient to cause the detents *i*, when their arms *h* are so struck, to engage the toothed bar *k*, so that the boxes e' e^2, carrying the detents so struck by the frame *c*, are in effect coupled to the rod *k*, and the latter will accompany the movement of said frame and shift the expansion or cut-off slide by means of the arm *l*, acting in the operating-rod M of said slide. The degree to which the engine is filled will then remain unchanged, for although the engine resumes its normal speed and the governor-balls return to their normal position, carrying with them the frame *c*, the detents *i* during this return movement will slide over the teeth of the bar *k* as the boxes e' e^2 settle back under the influence of counterweights to the normal position. Only when the frame *c* is moved again from the middle position in one direction or the other by the governor is the expansion-slide again acted upon and a corresponding change made in the degree of filling of the cylinder.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a cut-off-regulating mechanism, the

combination of the valve or expansion slide, a shifting device therefor connected to the governor and means normally held in position to be operated by said shifting device on motion in either direction to connect said shifting device to the expansion valve or slide to shift the latter and automatically disengage itself therefrom and return to normal position, substantially as set forth.

2. In an expansion-gear mechanism for steam-engines, the combination in a shifting device connected to the governor, detents mounted on each side of said shifting device, a toothed member connected to the expansion valve or slide and adapted to be engaged by said detents and means of disengaging said detents from said toothed member and automatically returning them to normal position, substantially as set forth.

3. In an expansion-valve gear for steam-engines, the combination of the expansion-valve, its shaft, and shifting rings and pawls mounted concentrically with said shaft and connected with the governor, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

MARTIN HANNER.

Witnesses:
N. C. ADAMURY,
JOH. MENTZEL.