No. 631,814. Patented Aug. 29, 1899.

E. L. POWELL.

COMPENSATOR FOR SIGNALS.

(Application filed Mar. 2, 1899.)

(No Model.) 4 Sheets—Sheet 1.

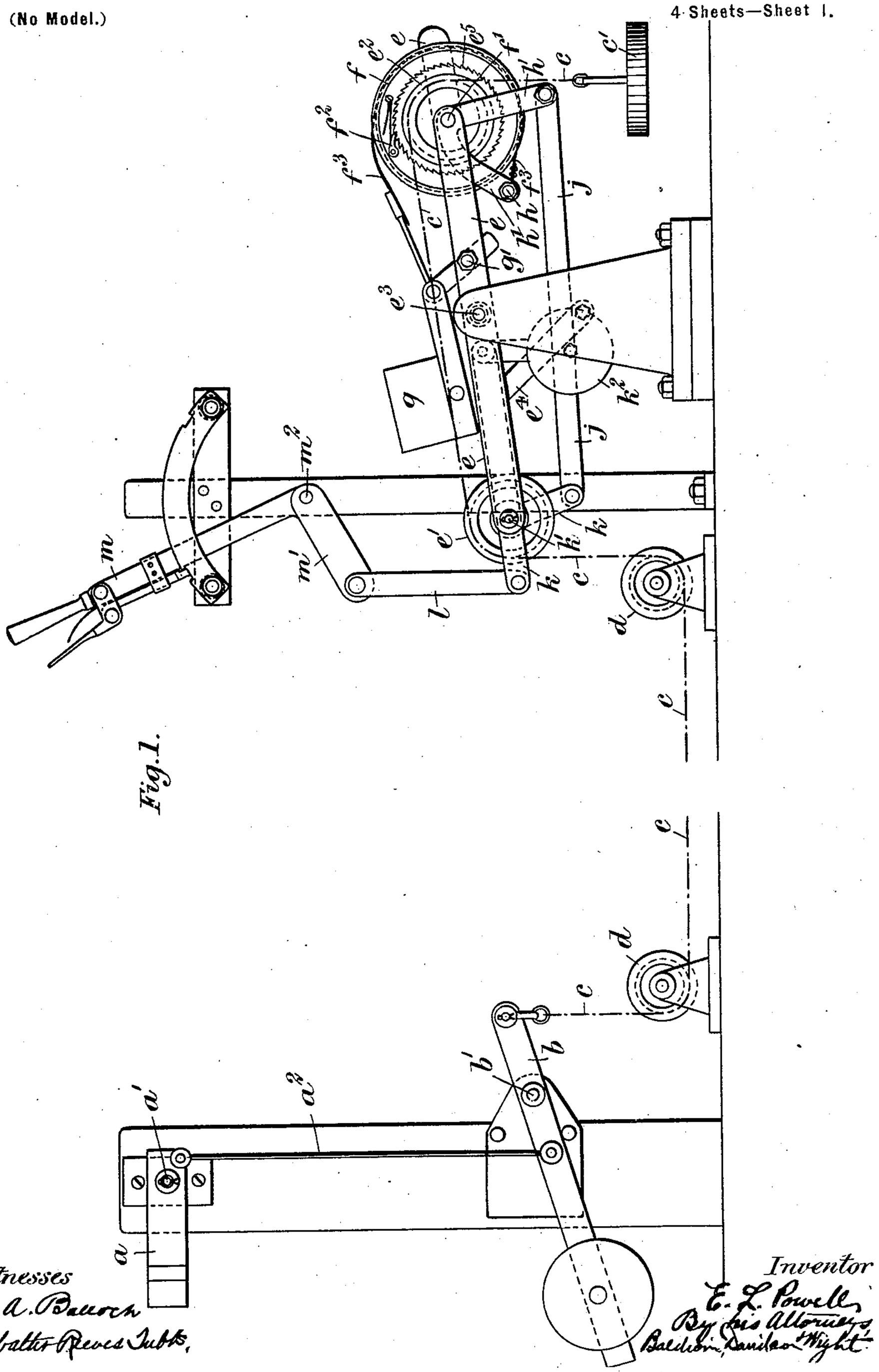

Fig. 1.

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COMPENSATOR FOR SIGNALS.

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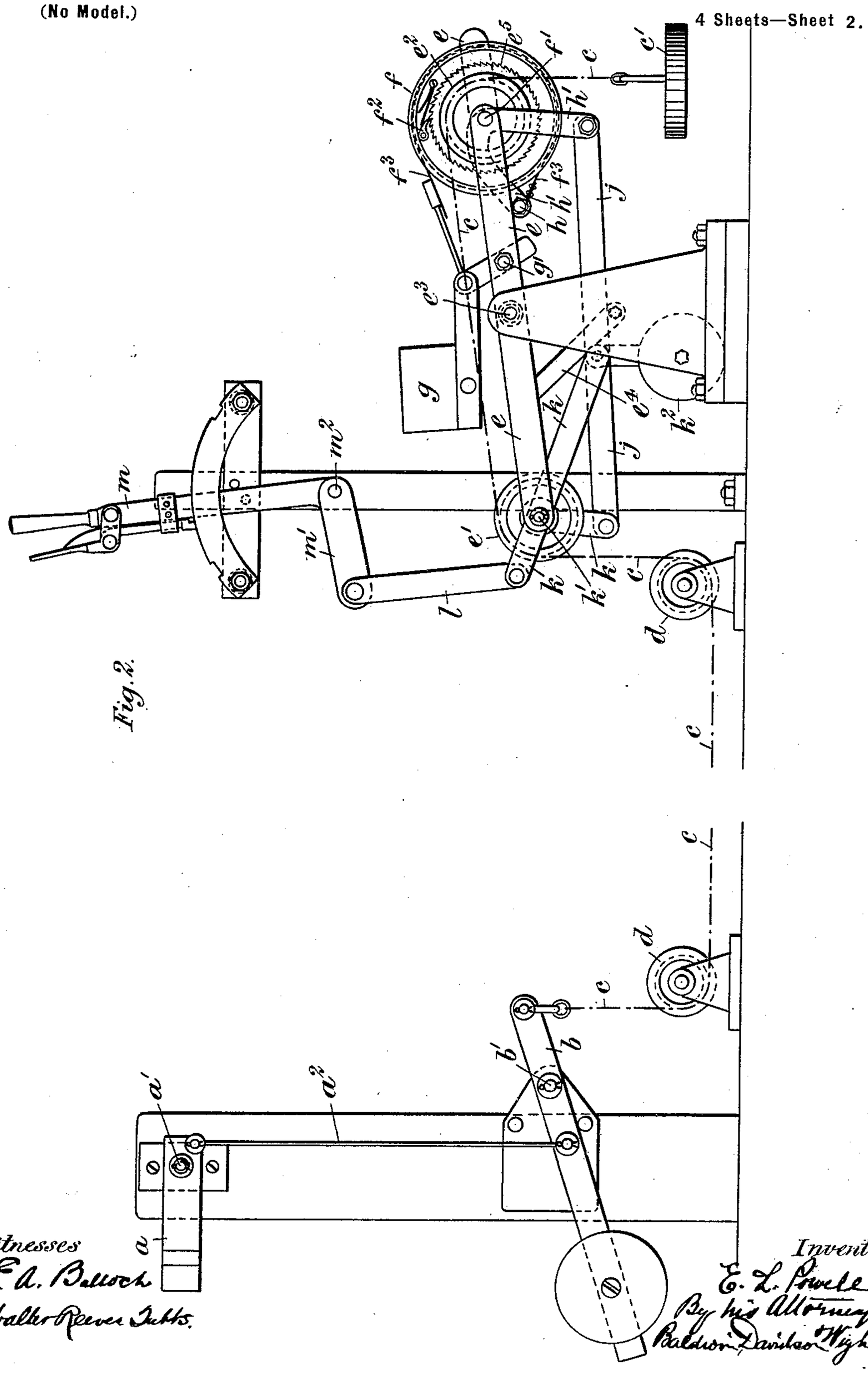

Fig. 2.

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No. 631,814. Patented Aug. 29, 1899.

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COMPENSATOR FOR SIGNALS.

(Application filed Mar. 2, 1899.)

(No Model.) 4 Sheets—Sheet 3.

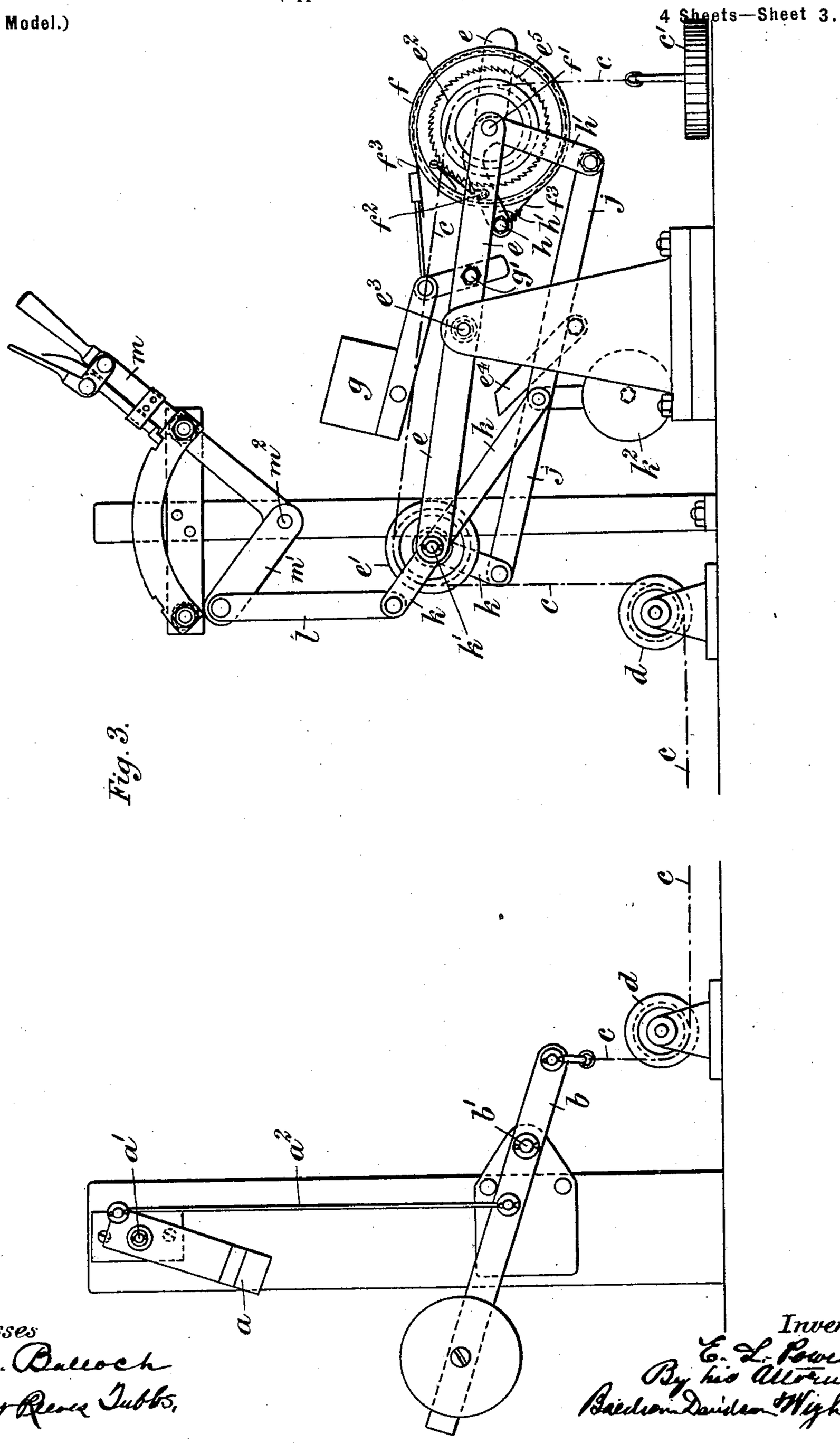

Fig. 3.

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No. 631,814. Patented Aug. 29, 1899.

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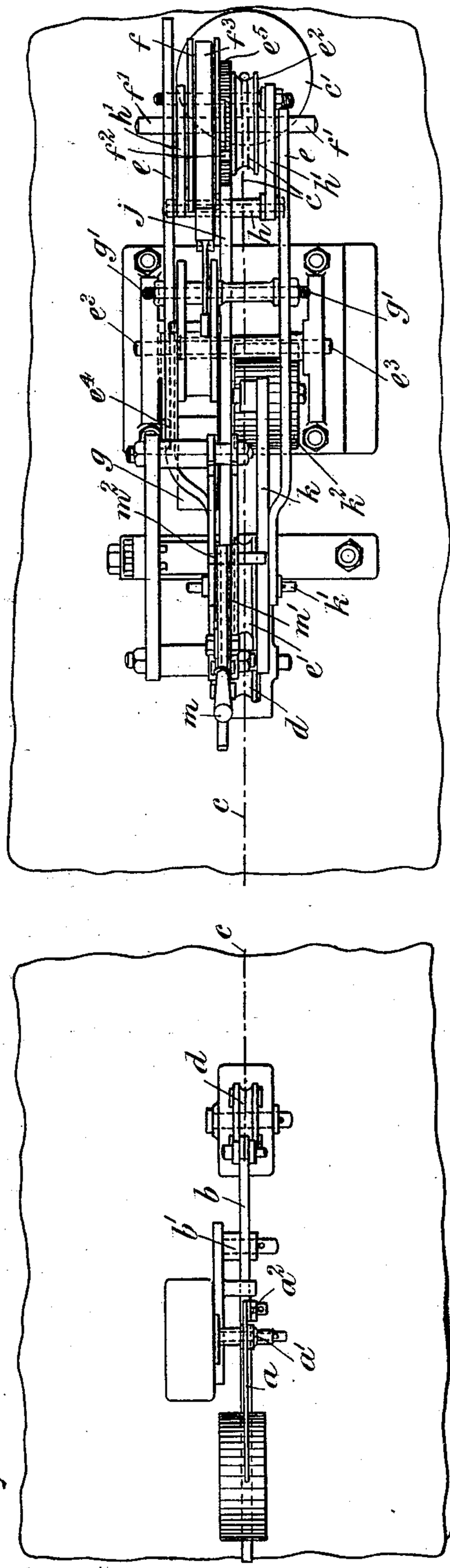
COMPENSATOR FOR SIGNALS.

(Application filed Mar. 2, 1899.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 4.



Witnesses
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Inventor
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UNITED STATES PATENT OFFICE.

EDGAR LISTER POWELL, OF HARROGATE, ENGLAND.

COMPENSATOR FOR SIGNALS.

SPECIFICATION forming part of Letters Patent No. 631,814, dated August 29, 1899.

Application filed March 2, 1899. Serial No. 707,523. (No model.)

To all whom it may concern:

Be it known that I, EDGAR LISTER POWELL, engineer, a subject of the Queen of Great Britain, residing at Winterfield, Harrogate, in the county of York, England, have invented a certain new and useful Compensator for Signals, of which the following is a specification.

The object of this invention is to prevent the undue straining of the wire or chain for operating the signal from the cabin and yet to allow the signal-lever always to be moved through the complete stroke.

As has before been proposed, the chain is not attached to the lever, but when the signal is raised it is disconnected from it and is kept stretched by a weight at its end, so that it can expand and contract freely and yet is always under a constant tension. When it is desired to lower the signal, the chain is taken hold of by the lever; but in place of this temporary attachment being, as heretofore, a rigid one I make it in such a manner that it can yield under any undue strain, so that the lever can always be moved without damage through its complete stroke, even though the signal has been fully lowered before it reaches the end of its course.

Figures 1, 2, and 3 are side elevations of the apparatus, respectively, showing the positions of the parts before the beginning of the stroke of the signal-lever, during its stroke, and at the end of its stroke. Fig. 4 is a plan of Fig. 1.

a is the signal, pivoted at *a'* and connected by the rod a^2 to the weighted lever *b*, which is pivoted at *b'* and normally keeps the signal in its raised or danger position.

c is the chain, fixed at one end to the lever *b* and carrying the weight *c'* at its other end. The chain *c* passes under pulleys *d d*, over intermediate pulleys, which are not shown, and over the pulleys *e' e²* on the rocking frame *e*, which is pivoted at e^3. When in the position shown at Fig. 1, the frame *e* rests on a stop or support e^4. The chain passes once or more around the pulley e^2 or is otherwise prevented from slipping on it. The pulley e^2 is mounted loose on the shaft *f'* of the brake-drum *f* and has fixed to it the ratchet-wheel e^5, gearing with the pawl f^2 on the drum. One end of the brake-strap f^3 is fixed to the weighted lever *g*, pivoted at *g'*, while the other end is fixed to the cross-bar *h*, connecting the bell-crank levers *h'* pivoted on the shaft *f'*. The bell-crank levers *h'* are connected by the link *j* to the bell-crank levers *k*, which are pivoted at *k'* to the frame *e*, and are connected by the link *l* to the arm *m'*, fixed to the signal-lever *m*, which is pivoted at m^2. One arm of the bell-crank levers *k* is prolonged and carries the weight k^2.

Normally the weighted lever *g* rests on the frame *e*, as shown in Fig. 1, the brake-strap f^3 being slack, and when the parts are in this position the pulley e^2 can turn in either direction and the chain can expand or contract freely, being always kept at a constant tension by the weight *c'*.

The action of the apparatus is as follows: During the first part of the motion of the lever *m* from the position shown in Fig. 1 the frame *e* remains stationary, but the bell-crank levers *h'* are turned, (by the movement of the link *j*, levers *k*, and link *l*,) tightening the brake-strap and raising the weighted lever *g*, as shown in Fig. 2. The cross-bar *h* now comes against the frame *e*, so that the levers *h'* are arrested, and the further movement of the lever *m* turns the frame *e* as a whole, raising the pulley *e'*, so drawing in the chain and pulling down the signal *a*. When the signal is fully down and no more chain can therefore be drawn in, the brake-drum *f*, and with it the pulley e^2, rotates against the resistance of the brake-strap f^3, and the stroke of the lever *m* can be completed without putting any undue strain on the chain, the parts finally assuming the position shown in Fig. 3.

It will be observed that the first action of the lever *m* in lowering the signal is to rotate the drum *f* and chain-wheel e^2 (thus drawing in chain and lowering the weight *c'*) without tilting the frame *e*. In the reverse movement, however, at the end of the return stroke of the lever, if the chain is too slack it cannot lift the weight *c'* again, so that the drum *f* revolves alone, leaving the wheel e^2 and weight *c'* stationary, and the slack of the chain is thus taken up.

What I claim is—

1. The combination of a signal, a chain operating it, a weight at the end of the chain, a pulley round which the chain passes, a brake-drum, a pawl and ratchet connecting the pulley and the drum, a signal-lever, and means

whereby the motion of the lever rotates the drum.

2. The combination of a signal, a chain operating it, a pulley around which the chain passes, a brake-drum, a pawl and ratchet connecting the pulley and the drum, and a signal-lever hauling on the chain between the signal and the pulley.

3. The combination of a signal, a chain operating it, a pulley around which the chain passes, a brake-drum, a pawl and ratchet connecting the pulley and drum, a signal-lever, and means whereby the motion of the lever first rotates the drum and then hauls on the chain between the signal and the pulley.

4. The combination of a signal, a chain operating it, a weight at the end of the chain, a rocking frame, two pulleys on the frame around which the chain passes, a brake-drum, a pawl and ratchet connecting one of the pulleys and the drum, a signal-lever and means whereby the motion of the lever first rotates the drum relatively to the frame and then rocks the frame.

5. The combination of a signal, a chain operating it, a weight at the end of the chain and tending to keep it tight, a signal-lever, a rocking frame, a pulley carried by the frame around which the chain passes, a brake-drum, a pawl and ratchet connecting the pulley and the drum, a brake operating on the drum and means whereby the movement of the lever applies the brake and rotates the frame.

6. The combination of a signal, a chain operating it, a weight at the end of the chain and tending to keep it tight, a signal-lever, a rocking frame, a pulley carried by the frame around which the chain passes, a brake-drum, a pawl and ratchet connecting the pulley and the drum, a radial arm pivoted to the frame at the axis of the pulley and drum, a weighted lever pivoted to the frame, a brake-strap encircling the drum and having its ends fixed to the radial arm and weighted lever respectively, a stop limiting the rotation of the radial arm relatively to the frame and connections between the signal-lever and the radial arm.

EDGAR LISTER POWELL.

Witnesses:
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