

(No Model.)

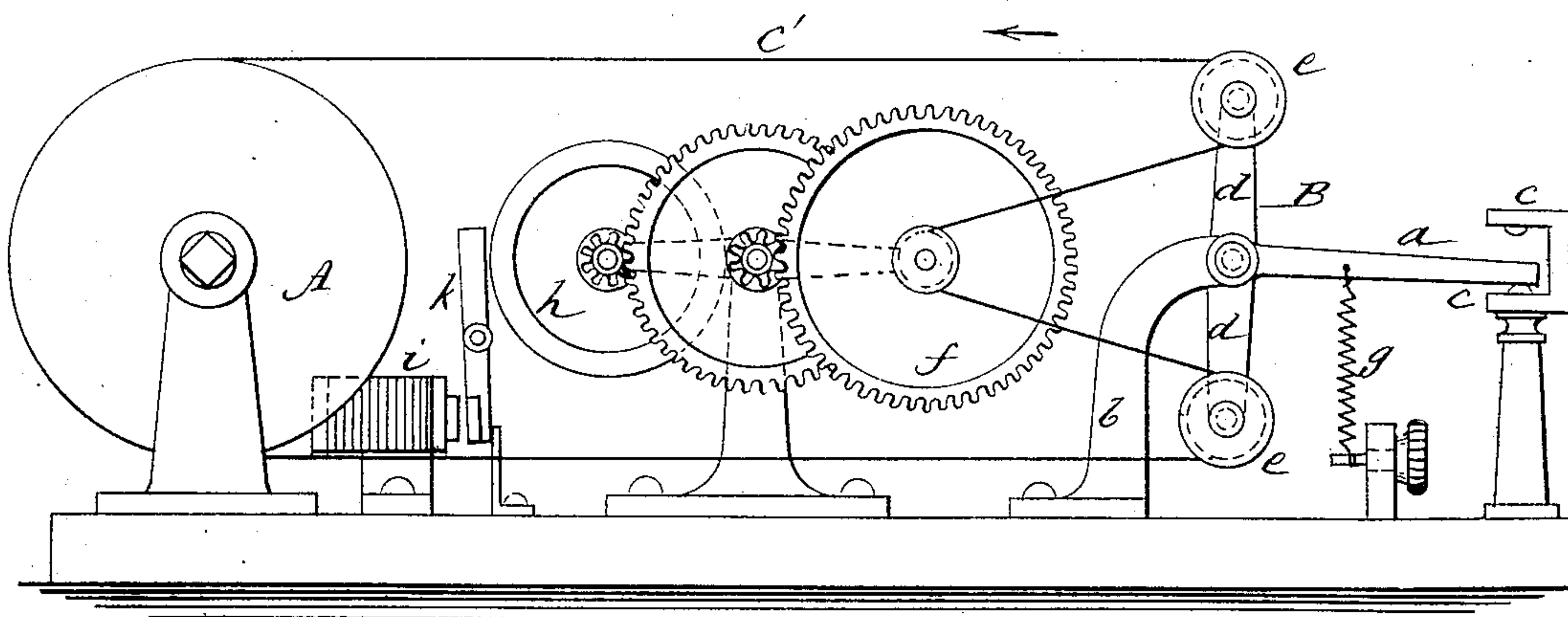
3 Sheets—Sheet 1.

S. D. FIELD.
Telegraph Relay and Sounder.

No. 227,750.

Patented May 18, 1880.

Fig. 1



WITNESSES:

C. Verux
L. Sedgwick

INVENTOR:

S. D. Field

BY

Mum Ho

ATTORNEYS.

(No Model.)

3 Sheets—Sheet 2.

S. D. FIELD.
Telegraph Relay and Sounder.

No. 227,750.

Patented May 18, 1880.

Fig. 2

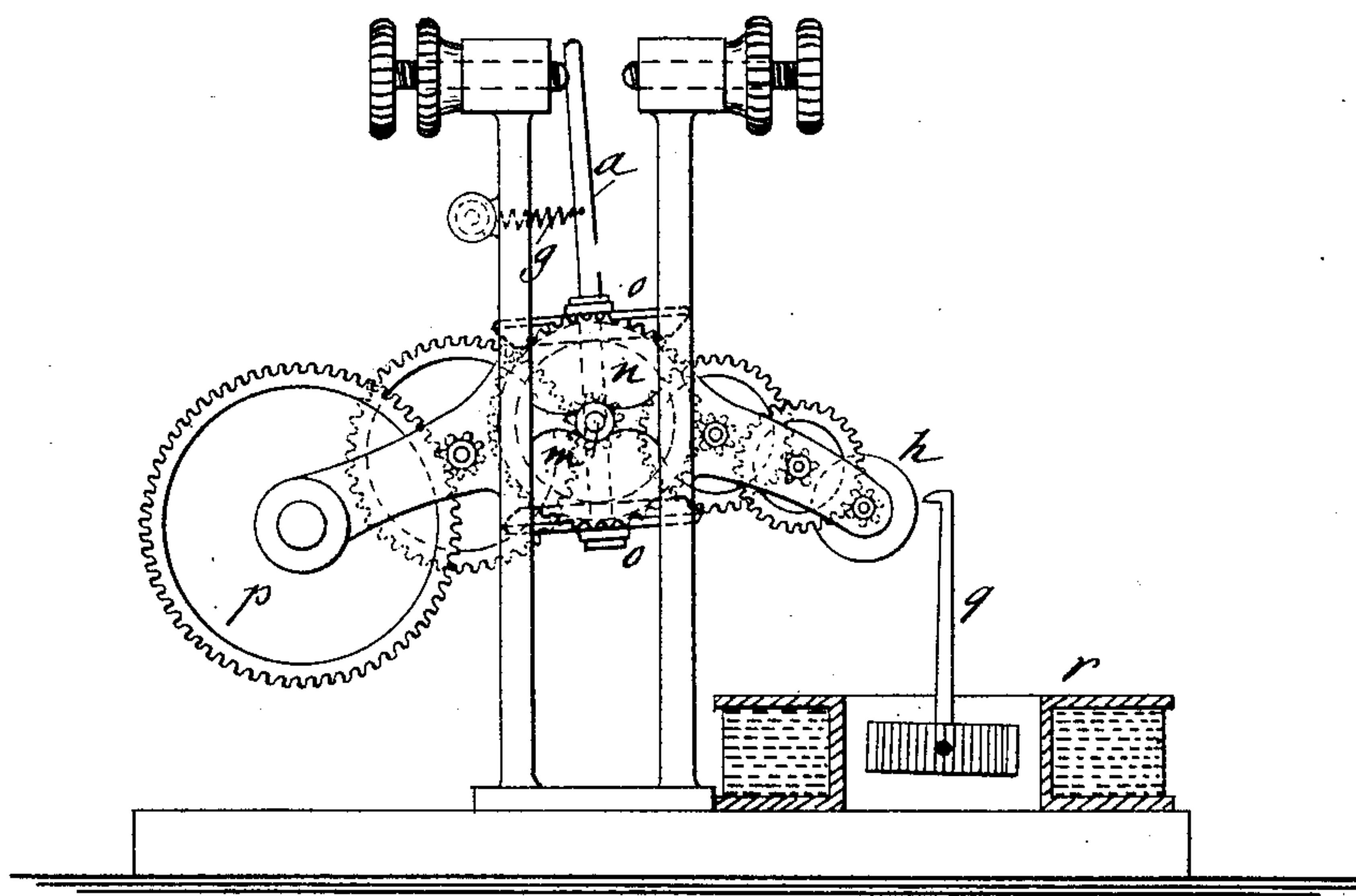
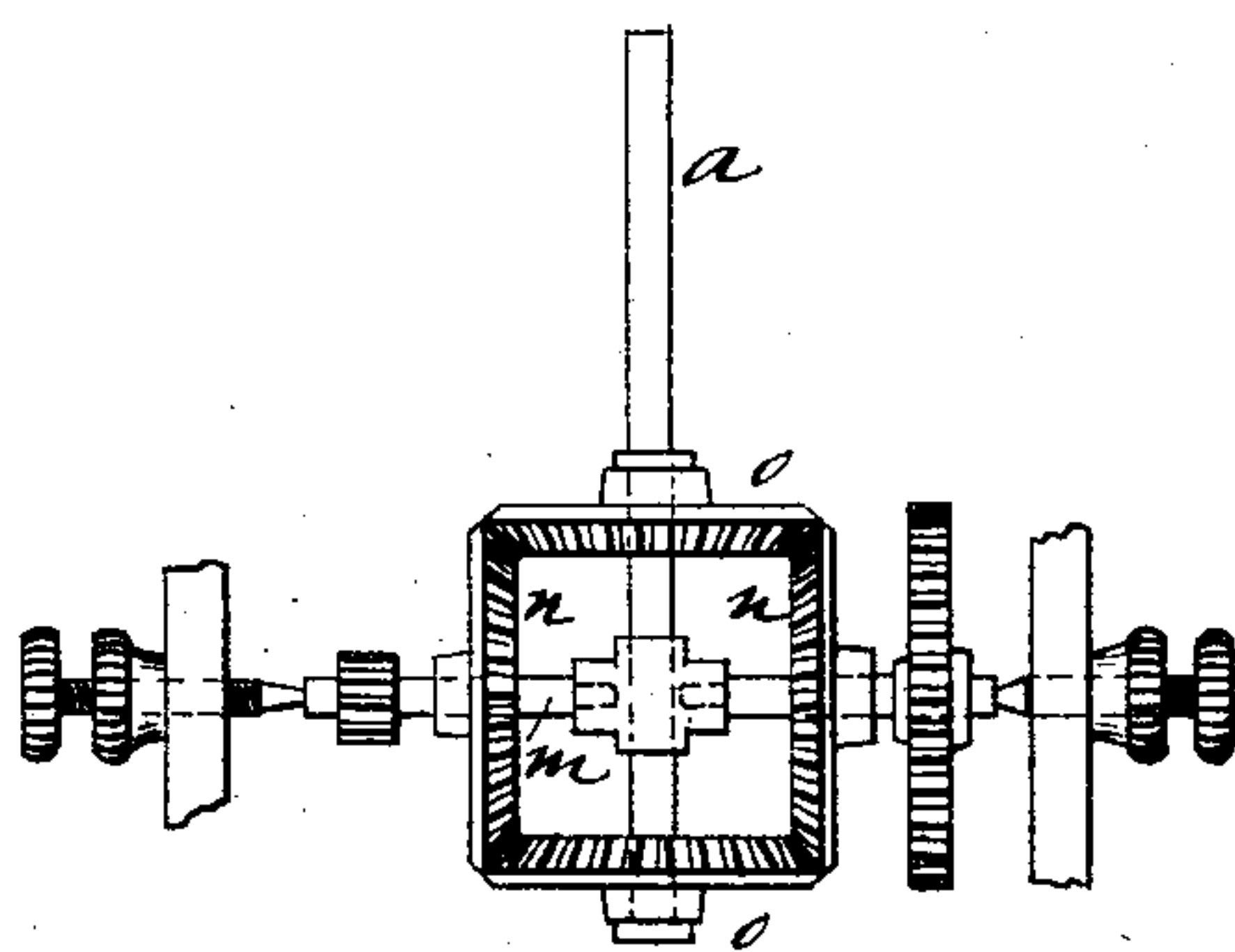


Fig. 3



WITNESSES:

C. Neveu
C. Sedgwick

INVENTOR:

S. D. Field

BY

Munn & Co

ATTORNEYS.

(No Model.)

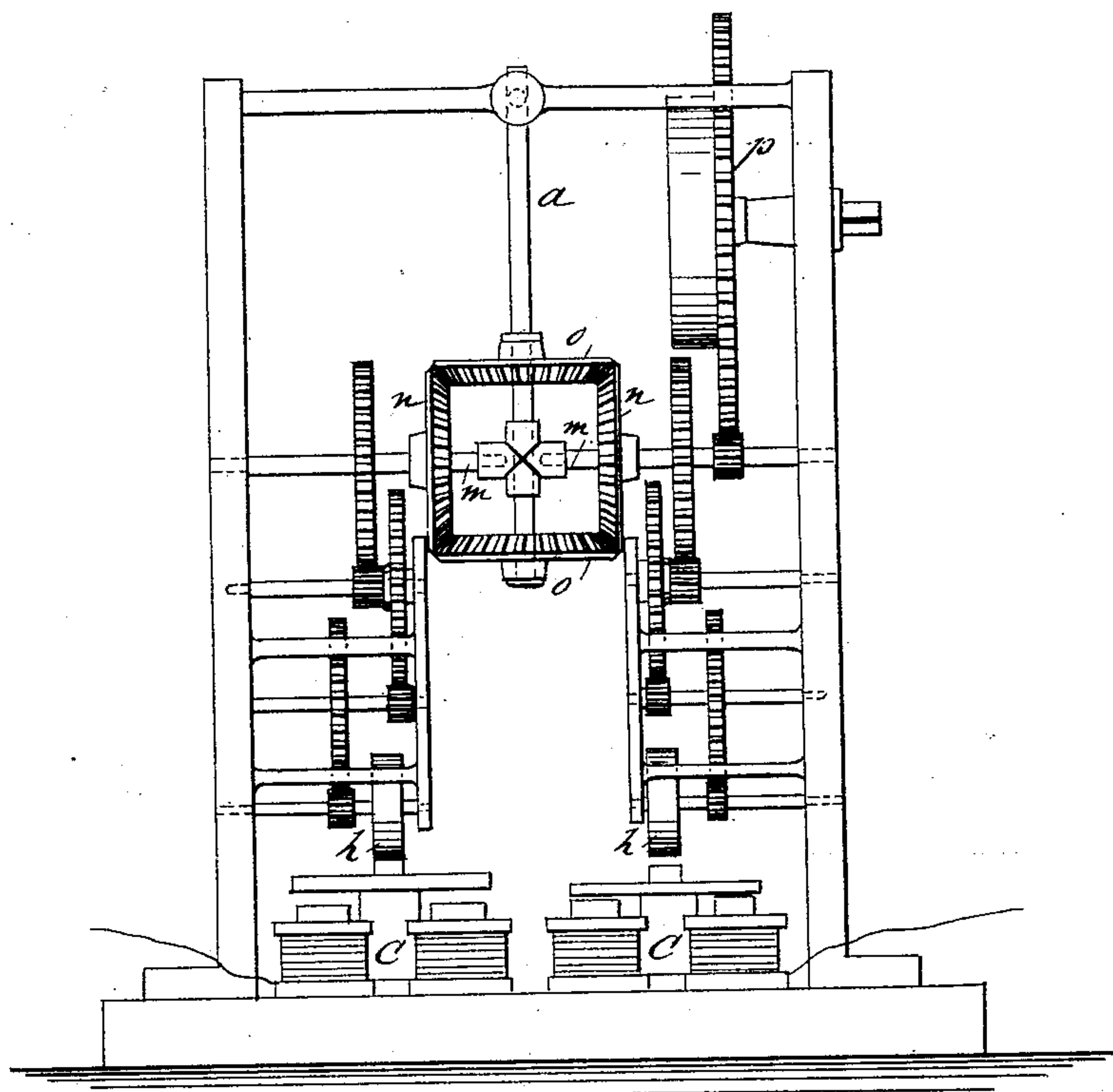
3 Sheets—Sheet 3.

S. D. FIELD.
Telegraph Relay and Sounder.

No. 227,750.

Patented May 18, 1880.

Fig. 4



WITNESSES:

C. Neveu
C. Sedgwick

INVENTOR:

S. D. Field

BY

Mum & Co
ATTORNEYS.

UNITED STATES PATENT OFFICE.

STEPHEN D. FIELD, OF NEW YORK, N. Y.

TELEGRAPH RELAY AND SOUNDER.

SPECIFICATION forming part of Letters Patent No. 227,750, dated May 18, 1880.

Application filed April 7, 1880. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN D. FIELD, of the city, county, and State of New York, have invented a new and useful Improvement in Telegraph Sounders and Relays, of which the following is a specification.

The object of my invention is to provide mechanical means for vibrating the tongue of a telegraph sounder or relay and actuate the same by increase and decrease of current, or by making and breaking the circuit.

My invention consists in a tongue fitted to vibrate between fixed points by the action of clock-work or other motive power, the clock-work being fitted with a brake that is operated by an electro-magnet in the line, so as to check and release the power, and thereby cause the vibration of the tongue.

In the accompanying drawings, Figure 1 is a side elevation of a sounder embodying my invention. Figs. 2 and 3 are side elevations of a modification. Fig. 4 represents a second modification.

Similar letters of reference indicate corresponding parts.

Referring to Fig. 1, A is the driving wheel or pulley, driven by clock-work and springs or weights in any desired manner. *a* is the tongue, the same being one arm of a three-armed lever, B, that is hung on a standard, *b*, so that the outer end of the tongue *a* may vibrate between the fixed points *c c*.

The two arms *d* of lever B carry at their outer ends friction-pulleys *e*, over which passes a belt, *c'*, from the pulley A, the said belt also passing back over a pulley on the arbor of the first wheel, *f*, of a train of gearing. The belt being carried in the direction of the arrow, the strain on the lever B tends to draw the tongue *a* in one direction. Upon the tongue *a* is fitted an adjustable spring, *g*, having tension sufficient to overcome the strain of the belt and retain the tongue upon the lower point *c*.

The train of gearing from wheel *f* gives motion to a brake-wheel, *h*. In connection with the wheel *h* is an electro-magnet, *i*, the armature *k* of which is fitted to bear on wheel *h* when the armature is drawn to the magnet.

The magnet *i* being in the line, so long as there is no current passing, the tongue is retained by the spring *g* in contact with the

lower point *c*. As soon as the circuit is closed to the magnet *i* the armature *k* brakes the wheel *h*, thereby checking the momentum of the gearing and increasing the strain on lever B by the belt sufficiently to overcome the spring *g* and cause the tongue *a* to move to the upper point *c*. The tongue will return as soon as the current is broken.

In Fig. 2 the tongue *a* is shown as fitted in connection with a nest of bevel-gears. *m* is an articulated shaft, on which the tongue swings, and which carries the bevel-gears *n n*, that mesh with the gears *o o* upon the tongue *a*.

p is the wheel, driven by clock-work, giving motion to one gear, *n*, and, through the bevel-gearing *m n*, to the second train of gearing, that drives the brake-wheel *h*.

g is the adjustable spring resisting the tendency of the gearing to move the tongue *a*. *q* is a galvanometer-needle pivoted within the coil *r*, and arranged to bear on the wheel *h* when a current is sent through the coil. This brake action of the needle *q*, by checking the second train of gearing, overcomes the spring *g*, and the tongue *a* is caused to swing to the opposite point.

In these figures no means are shown for maintaining a uniform velocity of the clock-work. This may be accomplished by a ball-governor actuating a friction-brake, or other devices may be used for insuring a synchronous movement, such mechanism being geared to the clock-work at any point between the impelling springs or weight and the sounding-lever.

In Fig. 4 the nest of gears similar to those in Fig. 2 is shown as controlled or balanced by two electro-magnets, C, one of which is provided with a polarized armature. The armature of each magnet C is fitted to brake a friction-wheel, *h*. One wheel *h* is driven from one side of the nest of gearing, while the other wheel *h* is driven from the other side. When a current is passing, the polarized armature is repulsed and bears on the brake-wheel, while the other armature is attracted and releases the other wheel *h*. The reverse action takes place when the circuit is broken. By this alternation of the armatures the tongue *a* is vibrated, and it will be seen that in either case the movement of the sounding-lever is given

by the clock-work with a force independent of the current, so that the desired sound may be obtained with a weak current. The extent of movement is also independent of the armature movement.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In telegraph relays and sounders, a tongue or lever fitted for being moved in one direction by gearing from a constant motor, and in the opposite direction by a spring, a brake-wheel driven by the motor by connection hung on the tongue, and an electro-magnet and armature fitted to check and release the brake-wheel by the opening and closing of the circuit, all combined for operation substantially as shown and described.

2. In telegraph relays and sounders, the

combination, with the pivoted tongue or lever *a* and its retractile spring *g*, of two trains of gearing connected at opposite side of the fulcrum of the lever, and driven from a single constant motor, a brake-wheel driven by one set of gearing, and a brake operated by an electro-magnet, substantially as shown and described, and for the purposes specified.

3. In telegraph relays and sounders, the lever *B*, fixed points *c*, spring *g*, driving-wheel *A*, belt *c'*, gear-wheel *f*, brake-wheel *h*, driven from wheel *f*, magnet *i*, and armature *k*, combined for operation substantially as and for the purposes set forth.

STEPHEN D. FIELD.

Witnesses:

GEO. D. WALKER,

A. W. HART.