

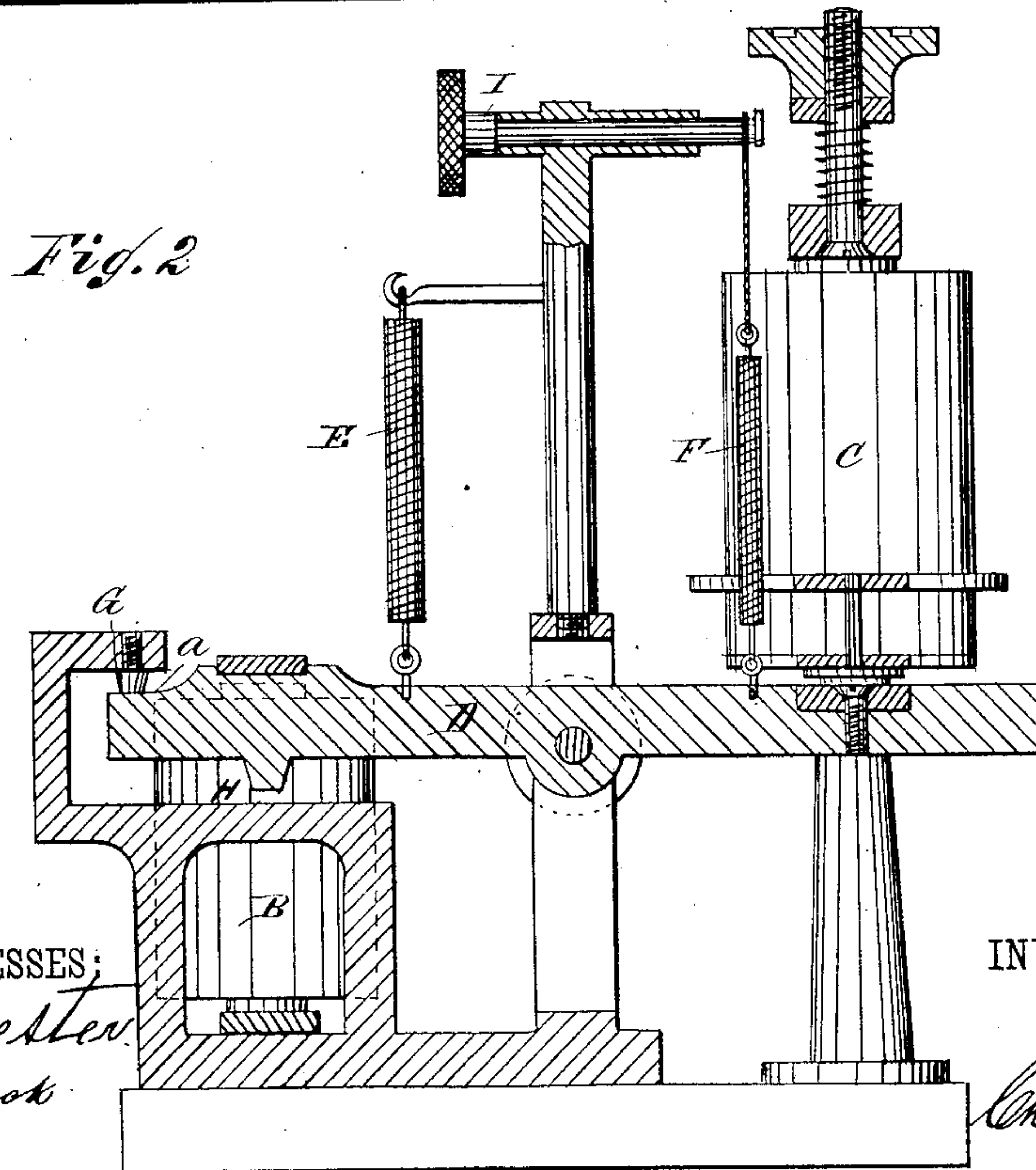
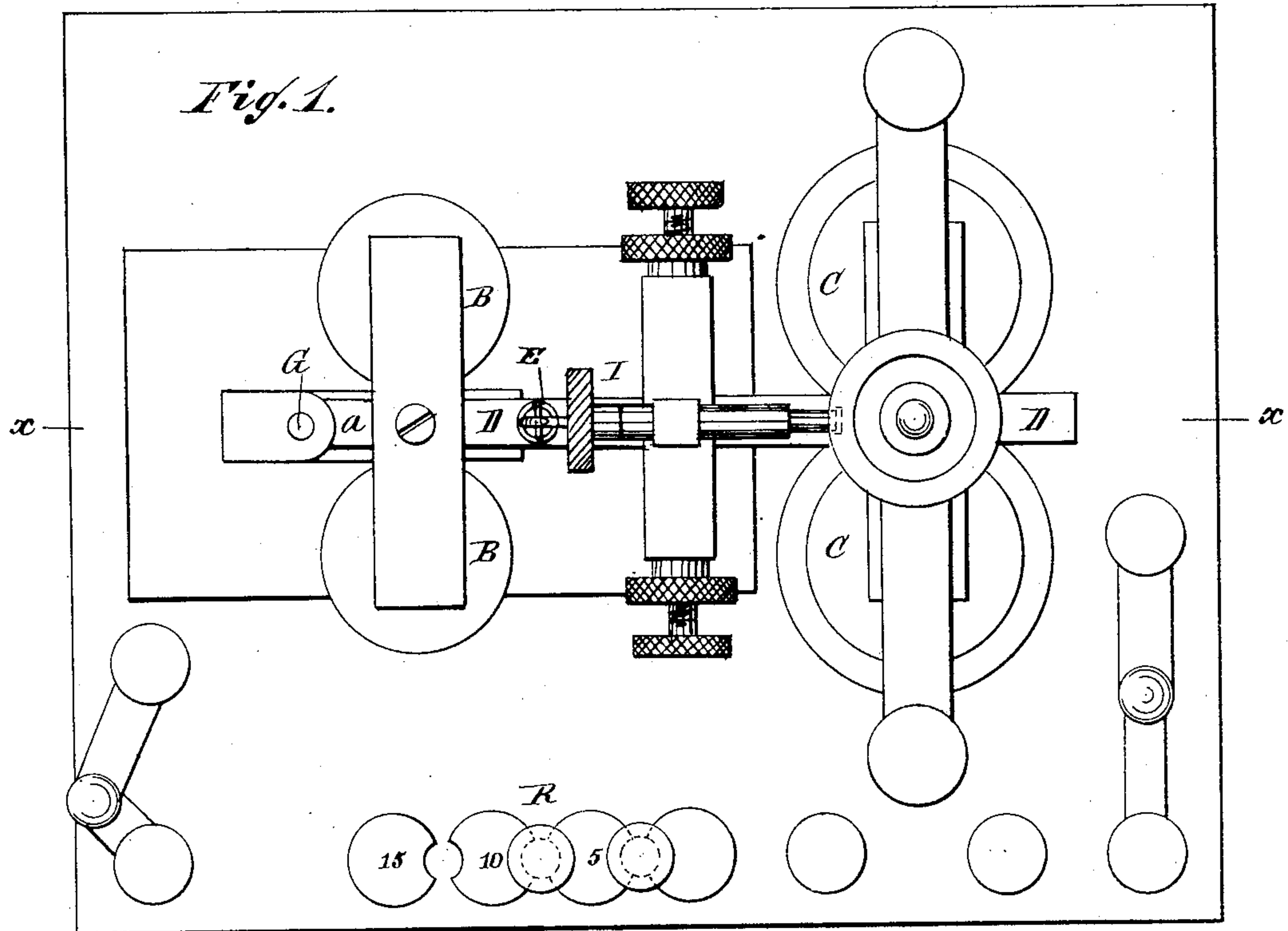
(No Model.)

3 Sheets—Sheet 1.

C. G. BURKE.  
RELAY AND SOUNDER.

No. 256,427.

Patented Apr. 11, 1882.



WITNESSES:  
*Charles L. Lister*  
*John. Speck*

INVENTOR

*Charles G. Burke*

(No Model.)

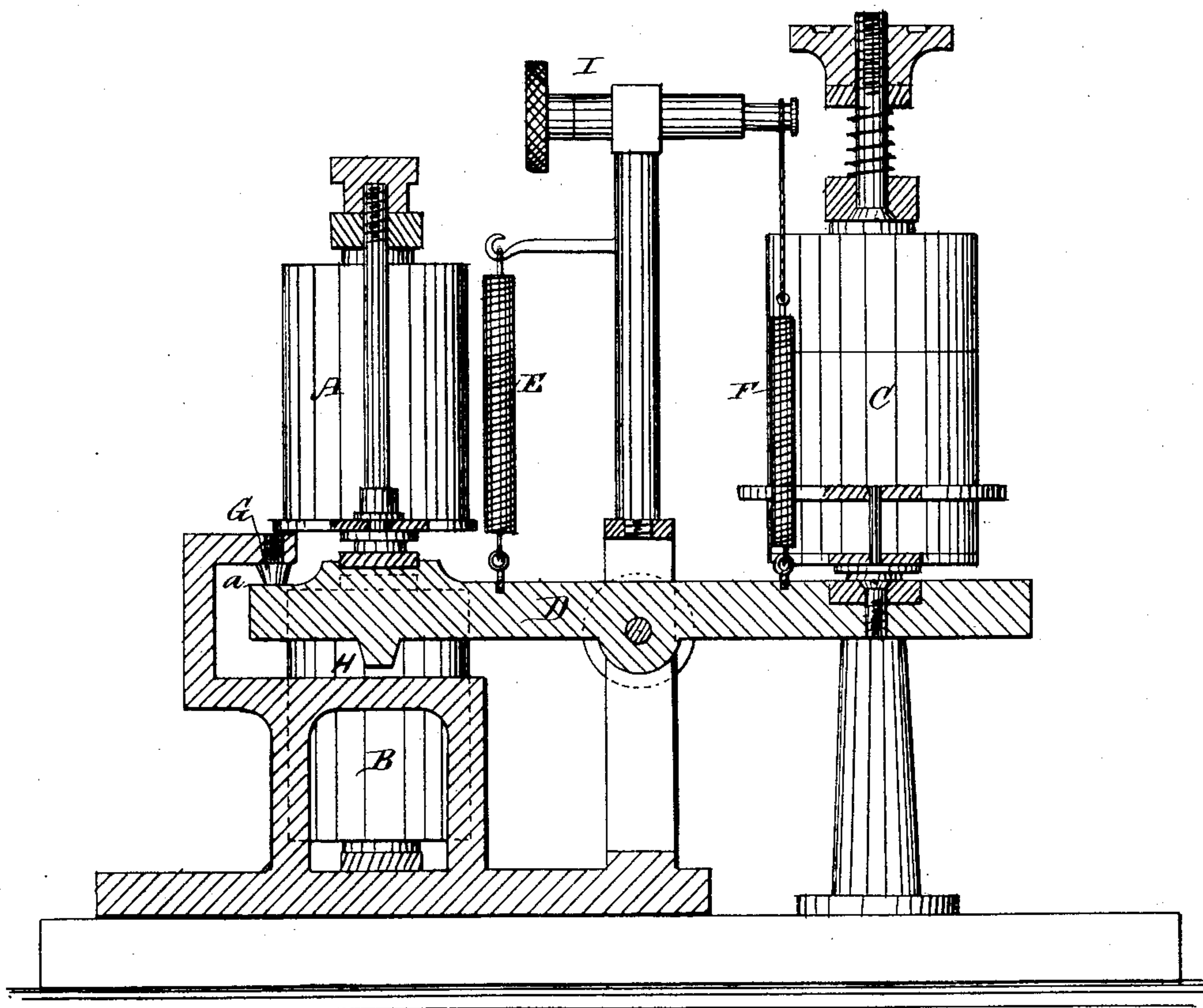
3 Sheets—Sheet 2.

C. G. BURKE.  
RELAY AND SOUNDER.

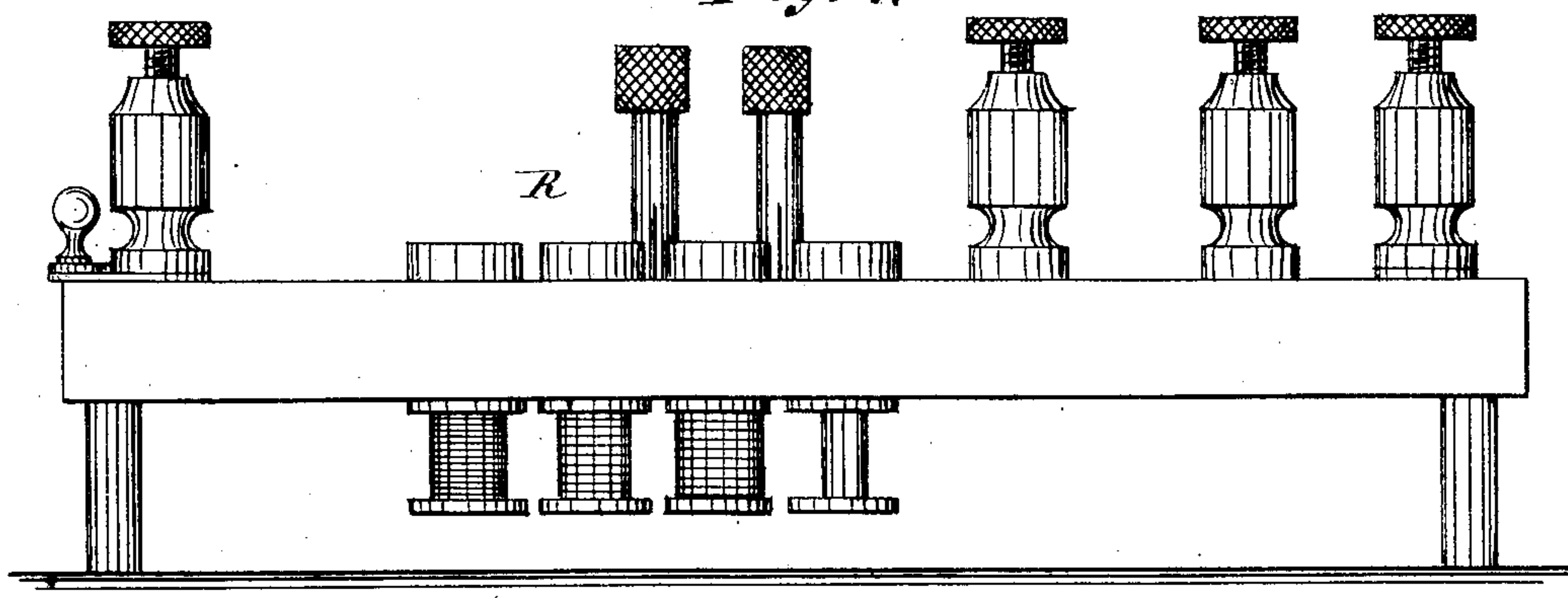
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*Fig. 3.*



*Fig. 4.*



WITNESSES:

*George Lester.*  
*John. Spink*

INVENTOR

*Charles G. Burke*

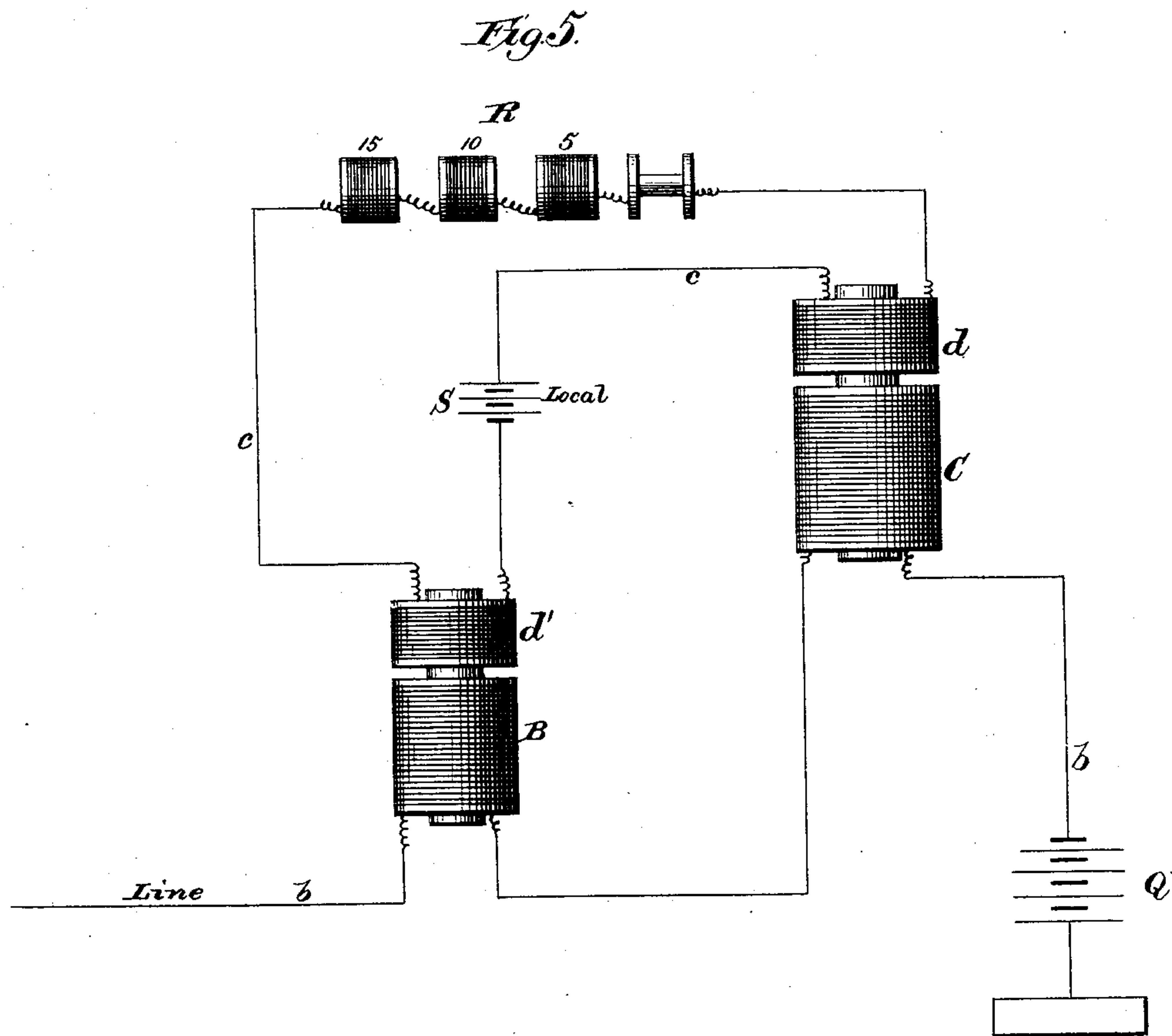
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3 Sheets—Sheet 3.

C. G. BURKE.  
RELAY AND SOUNDER.

No. 256,427.

Patented Apr. 11, 1882.



Witnesses,

Robert Everett.

James L. Norris.

Inventor,

Charles G. Burke



# UNITED STATES PATENT OFFICE.

CHARLES G. BURKE, OF NEW YORK, N. Y.

## RELAY AND SOUNDER.

SPECIFICATION forming part of Letters Patent No. 256,427, dated April 11, 1882.

Application filed January 18, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES G. BURKE, of the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Relays and Sounders, of which the following is a specification.

The invention consists in the combination of a line-circuit, a local circuit, an electro-magnet having independent coils wound in the same direction, one coil being in the line and the other in the local circuit, an adjustable spring assisting said magnet, an armature-lever, and a retracting-magnet in local circuit.

The nature of my invention, which is more particularly an improvement of the instrument and invention for which Letters Patent were issued to me January 31, 1882, No. 252,927, consists in adding to the instrumentalities described and set forth in said patent two springs exercising in their tension an opposition of force, and in further adding a controllable resistant for the purpose of modifying the force of the local battery used and described in said Letters Patent.

The invention consists in the combination of an electro-magnet and an adjustable spring operating together in the same line of direction, an armature-lever, and a spring-retractor of determined fixed operative power.

It further consists in the combination of an overlying and underlying magnet having two sets of independent coils wound in the same direction, an armature-lever, a controllable resistant in a local circuit modifying the power of a local battery continuously energizing one set of coils in said magnets, a retracting-spring of fixed tension, a retracting-magnet, and an adjusting-spring acting in the line of attraction, for operation substantially as hereinafter described.

In the accompanying drawings, Figure 1 is a top or plan view of an instrument illustrating my present invention. Fig. 2 is a sectional view of same on line *xx* of Fig. 1. Fig. 3 is a modification of the invention illustrated in Figs. 1 and 2. Fig. 4 is a side elevation of one form of resistant. Fig. 5 is a diagram illustrating the arrangement of coils of the attracting-magnets and the circuits employed therein.

The general construction and operation of my improved instrument are similar to those

shown and described in Letters Patent No. 252,927, heretofore referred to. A detailed description herein is therefore unnecessary, except as to what is new and claimed.

It will be seen that in the present invention there is employed a retracting-spring, *E*, the tension of which is fixed when armature-lever *D* is in its normal position, and an adjustable spring, *F*, the tension of which inclines in the opposite direction from the tension of spring *E*, and is in the same line with that of the magnetic attraction. It will further be seen that the power of local battery *S*, Fig. 5, is controlled to the extent of the rheostatic resistant *R*, which is regulated in the usual way. The power of retraction must always be greater than the power of adjustable spring *F* and the power exercised through coils *d* and *d'* by battery *S*, Fig. 5, and sufficient to hold armature-lever *D* against stop *G* when the power of the main-line battery is not being exercised through the magnets, and to retract armature-lever *D* promptly when the power of the main-line battery has been exercised, but is interrupted or ceases.

By the use of springs *E* and *F*, as well as that of resistant *R*, the necessary difference in the opposing powers or forces essential to the practical operation of the instrument may be preserved without any change in the magnetic field or diminution or increase in the power of retraction. The magnets may therefore be permanently placed in the best possible magnetic relation to the armature, and the best possible results be thereby attained.

In Fig. 5 the circuit of the local battery *S* as it passes through the resistant *R* and coils *d* and *d'* of overlying magnet *C* and underlying magnet *B* is shown; likewise the current from main-line battery *Q* as it traverses wire *c* through overlying and underlying magnets *C* *B*. It will be seen that the circuit from battery *S* through wire *b* and coils *d* and *d'* is a closed one, while the circuit from battery *Q* is intended to be closed and broken in the usual way.

Nothing claimed in my Patent No. 252,927, heretofore referred to, is intended to be claimed herein, and all disclaimers therein contained are further disclaimed.

No claim of novelty is made as to spring *E*, which is in common use, except in its combination with magnet *A* and spring *F*; but it is

claimed that spring F in its combinations as shown, and in all combinations wherein its power is exercised in the line of magnetic attraction and against the power of retraction, is new, and forms the chief features of novelty in my present invention.

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

1. The combination of a line-circuit, a local circuit, an electro-magnet having independent coils wound in the same direction, one coil being in the line and the other in the local circuit, an adjustable spring assisting said magnet, an armature-lever, and a retracting-magnet in local circuit, substantially as described.

2. The combination of an overlying and underlying magnet having two sets of independent coils wound in the same direction, an armature-lever, a local circuit, a controllable resistor in said local circuit modifying the power of the local battery continuously energizing one set of coils in said magnets, a retracting-spring of fixed tension, a retracting-magnet, and an adjusting-spring acting in the line of attraction, for operation substantially as described.

CHARLES G. BURKE.

Witnesses:

GEORGE LESTER,  
JOHN SPECK.