

(No Model.)

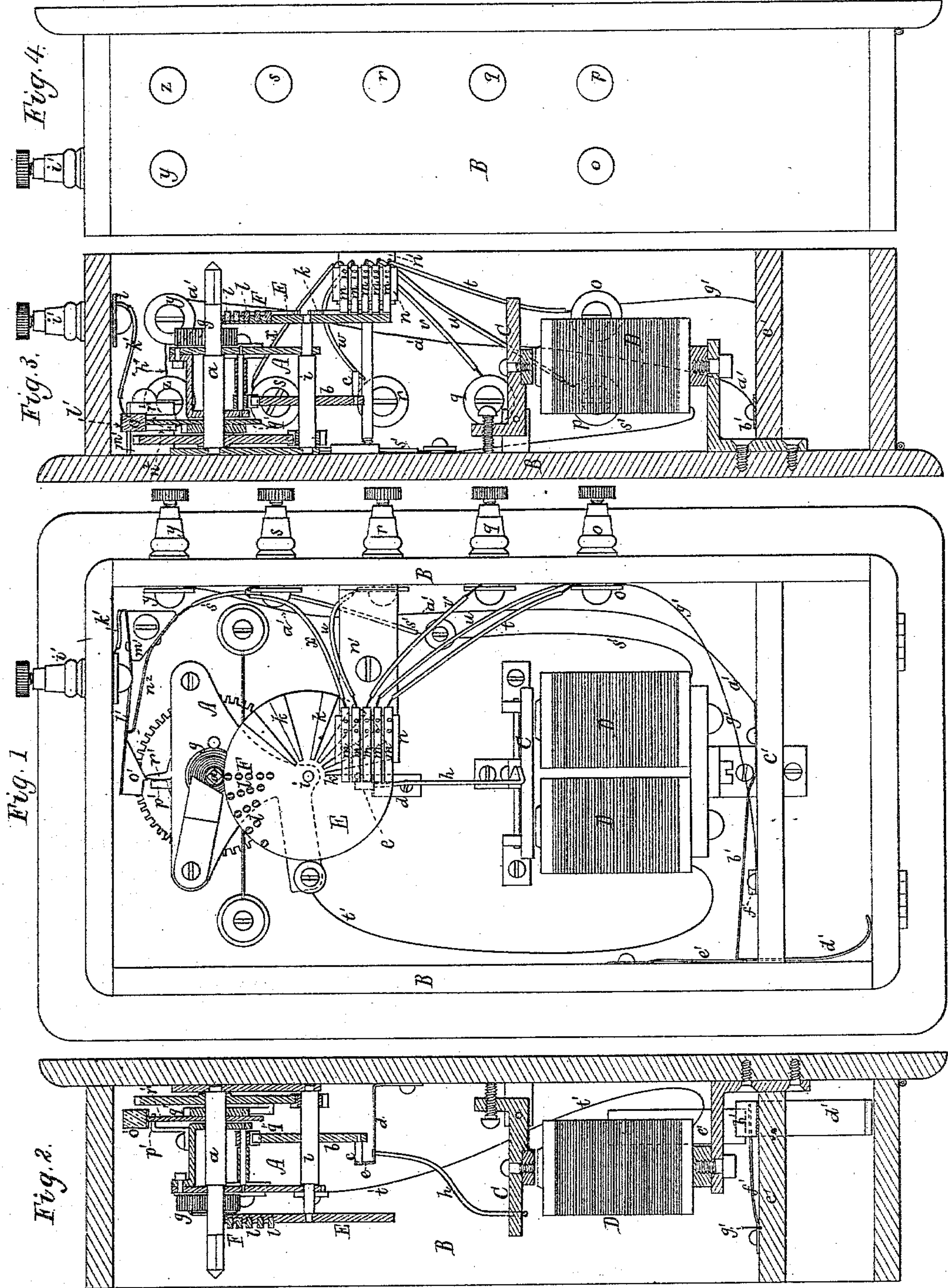
2 Sheets—Sheet 1.

M. D. PORTER.

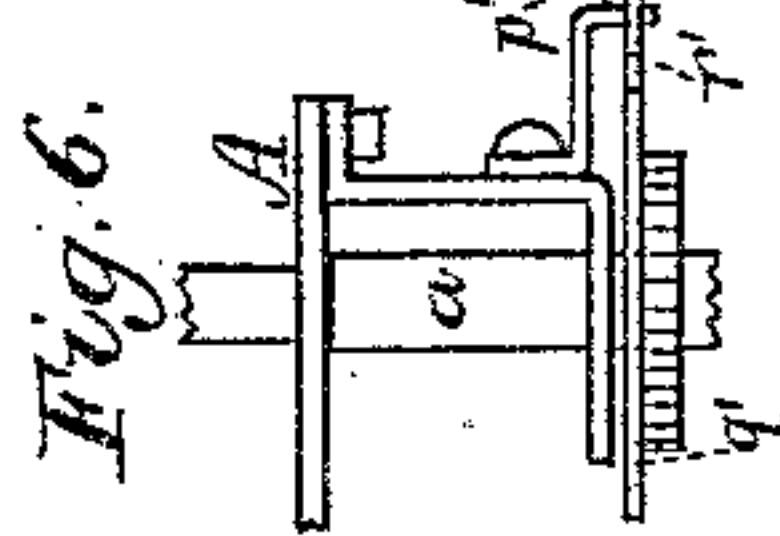
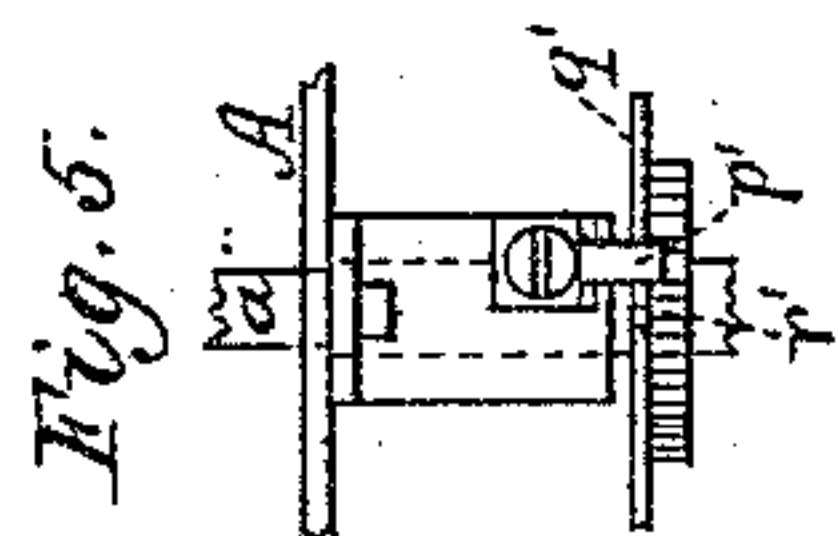
ELECTRIC FIRE ALARM APPARATUS.

No. 296,874.

Patented Apr. 15, 1884.



Witnesses
S. N. Piper
C. Pratt.



Inventor
Major Dane Porter
by *R. H. Eddy* att'y

(No Model.)

2 Sheets—Sheet 2.

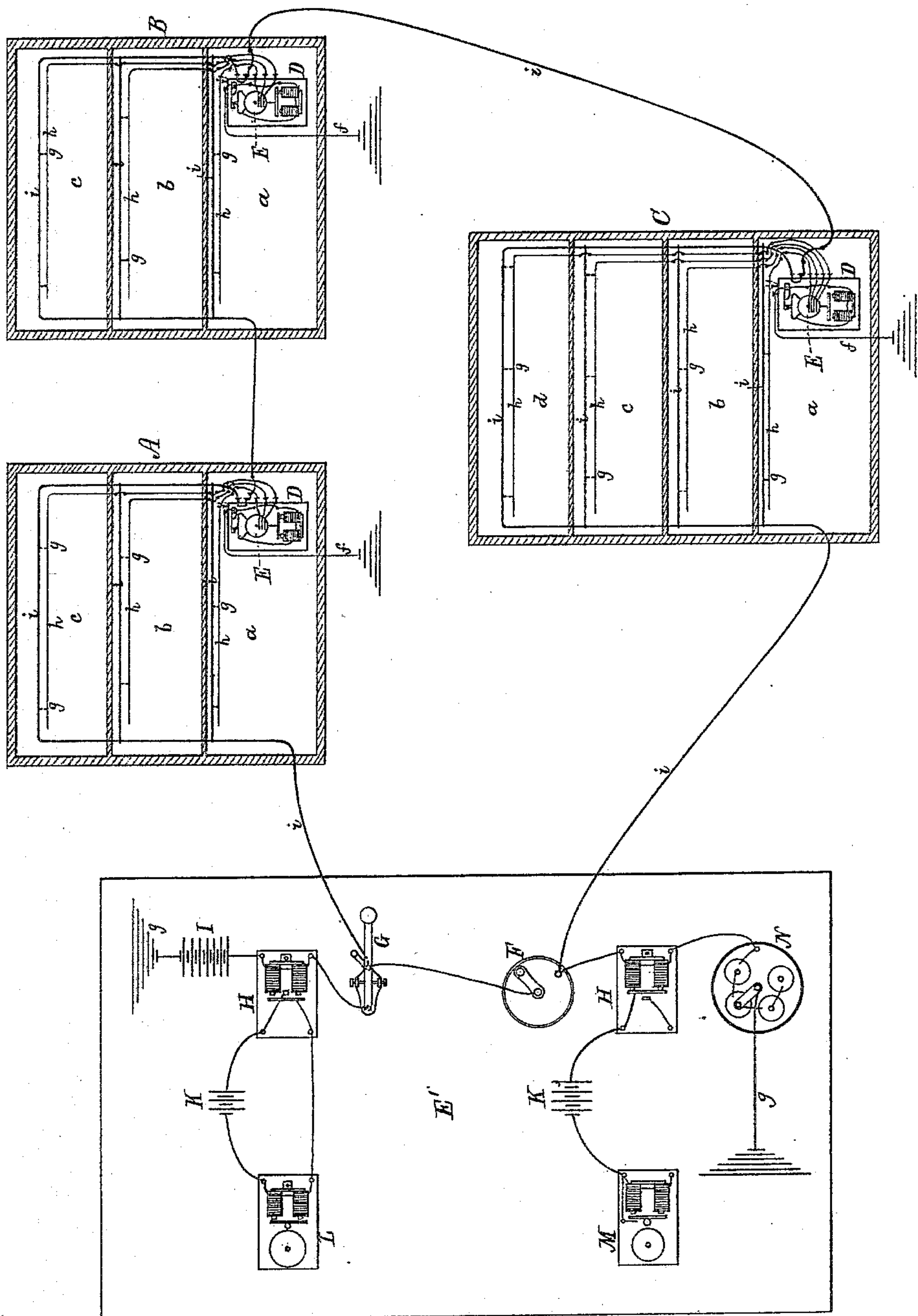
M. D. PORTER.

ELECTRIC FIRE ALARM APPARATUS.

No. 296,874.

Patented Apr. 15, 1884.

Fig. 7.



Witnesses

S. N. Piper.
C. B. Pratt.

Inventor

Major Dane Porter.
by R. H. Eady atty.

UNITED STATES PATENT OFFICE.

MAJOR DANE PORTER, OF BOSTON, MASSACHUSETTS.

ELECTRIC FIRE-ALARM APPARATUS.

SPECIFICATION forming part of Letters Patent No. 296,874, dated April 15, 1884.

Application filed December 11, 1883. (No model.)

To all whom it may concern:

Be it known that I, MAJOR DANE PORTER, a resident of Boston, in the county of Suffolk, of the Commonwealth of Massachusetts, but a native of Nova Scotia, and a subject of the Queen of Great Britain, have invented a new and useful Improvement in Fire-Alarm Apparatus; and I do hereby declare the same to be described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is an elevation, and Figs. 2 and 3 are vertical and transverse sections, of an alarm apparatus containing my invention, the nature of which is defined in the claims hereinafter presented. Fig. 4 is a side view of the case, showing the circuit-wire connection-clamps thereof. Fig. 5 is a front view, and Fig. 6 an edge view, of the disk *q'*, its tooth *r'*, and the abutment *p'*, hereinafter mentioned. Fig. 7 is a diagram of the apparatus herein described and an electrical circuit connecting it with three buildings, all of which will be hereinafter explained.

The said apparatus is for the purpose of telegraphing to a station not only the designating number of a building on fire, but that of the story in such building in which the fire may be.

In the drawings, A denotes a clock-movement, whose winding-arbor is shown at *a* and escapement-wheel at *b*. There projects from such wheel a short stud, *c*. Near the wheel, and fixed to the back of the case B of the apparatus, is a spring, *d*, having extended from it, directly in front of the escapement-wheel, a projection, *e*. This projection, when against the stud *c* of the escapement-wheel, prevents such wheel from being revolved and stops the clock-movement, the latter being set in operation by its spring when wound up, and the projection *e* is drawn away from the said stud *c*. The spring *d* has connected to it by a wire, *h*, the vibratory armature C of an electro-magnet, D, arranged in the case B, in manner as represented. There is fixed concentrically on the arbor *i* of the said escapement-wheel *b* a disk, E, having extended from its face a series of radial ribs, *k*, there being shown in the draw-

ings six of them. Two of them, which may be termed the "unit-ribs," are placed at a greater distance from the remaining four (which may be termed the "tens-ribs") than there is between the said two or any two next adjacent of the said four. These ribs so arranged are intended to indicate the number "42," which may be supposed to be the designating number of the building to contain the apparatus. For any other designating number the disk is to have tens and units ribs in number corresponding to the tens and units in the designating number. Besides these ribs, there is arranged on the face of the disk E a series, F, of studs, *l*, which are disposed in radial ranges, as shown, one stud being in the first range, two in the next, three in the third, four in the fourth, and five in the fifth, those of each range being at equal distances apart. These ranges are to indicate the numbers of the stories of a building.

Disposed in front of the disk E is a series of five fingers or springs, *m*, whose feet are in a direction radial to the face of the disk, as represented, and rest on the first of the ribs *k* when the clock mechanism is stationary, as shown in Fig. 1. These springs are fastened to and project from a block, *n*, of hard rubber or other proper electric insulating material, supported by a bracket, *n'*, fastened to one of the sides of the case. From these springs there are extended to five circuit-wire connection-clamps, *o*, *p*, *q*, *r*, and *s*, projecting from the side of the case, five wires, *t*, *u*, *v*, *w*, and *x*. Besides the said clamps, there are two others, *y* and *z*, to the case, all being arranged as represented.

In each story of the building we are to suppose there is to be placed at least one electric-circuit closer of some proper kind, such as that by the expansion of some part or parts of it by heat will cause the electric circuit in which it may be placed to be closed. These several electric-circuit closers are to be in electric circuits properly arranged in the stories of the building, and having their ground-wires connected with the wires *t*, *u*, *v*, *w*, and *x*. The main wire of the said circuits connects with the clamp *y*. From this clamp a wire, *a'*, extends to a metallic spring, *b'*, fastened to a par-

tion, c' , extending across the lower part of the case. From this spring a handle, d' , goes down through the partition. At the free end of the spring, and fastened to the side of the case, and arranged as shown, is another spring, e' . Furthermore, under the spring b' , and secured to the partition, is a plate or strip, f' , of metal, from which a wire, g' , is led to the connection-clamp o .

10 The clamps y and z are connected by a short wire, h' , extending from one to the other of them. These two clamps have wires of the main circuit leading from them. A ground-wire connects with another clamp, i' , fixed in the upper end of the case. From this clamp a wire, k' , leads to a metallic spring, l' , supported by and fixed to a stationary block of hard rubber, m' , from which a metallic arm, n^2 , extends, as represented, to the spring l' . The said spring l' has projecting down from it at its free end a cam, o' , of hard rubber. A stationary stop or abutment, p' , is extended from the frame of the clock-movement, and there is fixed on the winding-arbor of such movement a disk, q' , having a tooth or cam, r' , projecting from its periphery. The said tooth r' and abutment p' determine the extent of revolution of the winding-arbor to contract its operative spring, the spring, when either fully contracted or expanded, causing the cam or tooth to bring up against the abutment. In its revolution the tooth r' will be carried against the inclined edge of the cam o' , and by acting against it will cause the spring l' to be moved upward out of contact with the arm n^2 , and thus break the ground-circuit connected with the clamp i' , such breaking of such circuit being necessary or desirable when the clock-movement may run down. From the metallic arm n^2 a wire, s' , leads to one of the coils of the electro-magnet, another wire, t' , being led from the other coil to the metallic frame of the clock-movement. From this it will be seen that the wire t' becomes electrically connected with the disk E.

45 With the above-described apparatus in a building, and with an electric circuit extending therefrom to a station and to an alarm thereof of suitable kind to be set in action on the circuit being closed, it will be seen that in case of a fire occurring in either of the stories of the building, and causing the circuit-closer therein to expand and close the circuit, the armature of the electro-magnet will be drawn up to the magnet, whereby the escapement-wheel of the clock-movement will be set free. The actuating-spring of the said clock-movement being wound up, the movement will be put in action, so as to cause the disk E to revolve. In so revolving the tens and units ribs will be moved successively in contact with the series of elastic fingers m , whereby the alarm-circuit will be closed or broken, so as to cause the bell of the alarm to be struck as many times as there are ribs to the disk E, thus indicating the number of the build-

ing—as 42, for instance. The disk E continuing to revolve, the concentric ranges of studs l will be moved along underneath the fingers m , whereby that one of them which may be in the circuit of the circuit-closer of the story in which the fire may be will, by the curved range of studs that may be passed along directly underneath it, be acted on, so as to cause the circuit to be alternately broken and closed, the number of the closures of it being indicated by the sounds of the bell of the alarm at the station. From the above it will be seen that by means of my apparatus, constructed and applied substantially as described, in case of a fire occurring in any story of a building notice of the number of such building, as well as that of the story, will be given to the distant station.

The case B, I usually make with a cover hinged to it to close it on the front, and I also provide such cover with a lock to lock the cover to the case. I also have the lower end of the case open, and, if necessary, provide it with a cover to close it. If, now, we suppose the case to be closed and locked, and a person in the room in which it may be discovers an adjacent building to be on fire, and desires to give notice of such to the distant station, to do this he has only to open the lower cover of the case, (which is not to be locked,) and to take hold of the handle d' and pull it downward, so as to draw the spring b' into contact with the metallic strip f' , which taking place the circuit will be closed, the disk E set in revolution, and the alarm will be struck to indicate the number of the building in which the person may be, thus giving notice that there is a fire there or in the vicinity. On the handle being so pulled down, the spring e' will, by its elastic force, fly forward upon the spring b' and prevent it from springing away from the strip f' . The object of the spring e' is to accomplish this in order to indicate to a person who may next open the case that the apparatus has been set in action by the handle being pulled, and not by the action of heat, as described.

In Fig. 7 the apparatus represented in Fig. 1 is shown at D in the lower stories of each of the three buildings A, B, and C. Each of the buildings A and B have three stories, a , b , and c , the building C being represented as having four stories, a , b , c , and d . A ground-wire is shown f as proceeding from each of the clamps i' . One or more thermostats are to be supposed to be in each story and duly connected with circuit-wires h , leading to the apparatus, and also with the wires i of the main circuit, leading to a distant station, E' , provided with a switch, F , a key, G , two relays, H , a main-circuit battery, I , relay-batteries K , a gong-alarm, L , a vibrator-alarm, M , and a series of resisting-coils, N , provided with a ground-wire. On a fire occurring in either story of each of the buildings, and one or more of the thermostats of such story being in consequence there-

of caused to close the circuit in such story, the armature of the magnet of the apparatus in the lowest story will be drawn to its magnet, thereby setting free the disk E of the apparatus, whereby results as hereinbefore stated will follow.

The circuit from the positive to the negative pole of the battery through the magnet D may be thus described: In either building the circuit is from the ground through the wire *f* to the binding-screw *i'*, Fig. 1, thence through the wire *h'* to and through the spring *l'*, through the arm *n'*, thence by the wire *s'* to and through the magnet D, thence by the wire *t'* to the clock-movement (see Figs. 1 and 2) and the disk E, thence by the fingers *m* and wires *h* to the thermostats or circuit-closers of the stories of the building, thence by the wire *i*, Fig. 7, to the closed key G, thence through the relay H to one pole of the battery I, thence through the battery to its other pole, thence to the ground. In case of a fire taking place in either story of the building, the thermostat of such story will close the circuit and an alarm will be given.

In the above-described telegraphic fire-alarm apparatus, I claim—

1. The combination of the rotary disk E, (provided with ribs and studs, as described,) the series of fingers *m*, the clock-movement A, the electro-magnet D, its armature C, and the mechanism connected therewith and with the escapement-wheel of the said clock-movement, and consisting of the wire *h*, spring *d*, projection *e*, and stud *c*, all being adapted and to operate with electric-circuit wires and circuit-

closers and an electric alarm, substantially in manner and for the purposes as represented.

2. The combination of circuit-breaking mechanism, substantially as described, (consisting of the spring *l'*, arm *n'*, insulating-block *m'*, hard-rubber cam *o'*, abutment *p'*, disk *q'*, and its tooth or cam *r'*, arranged and adapted as set forth,) with mechanism, essentially as explained, consisting of the rotary disk E, (provided with ribs and studs, as described,) the series of fingers *m*, the clock-movement A, the electro-magnet D, its armature C, and the mechanism connected therewith and with the escapement-wheel of the said clock-movement, and consisting of the wire *h*, spring *d*, projection *e*, and stud *c*, all adapted and for use substantially and for the purposes as represented.

3. The combination of the circuit-closing mechanism, (consisting of the spring *b'*, its handle *d'*, metallic strip *f'*, and latching-spring *e'*), arranged in the lower part of the case B, as explained, with mechanism, essentially as represented, consisting of the rotary disk E, (provided with ribs and studs, as described,) the series of fingers *m*, clock-movement A, electro-magnet D, its armature C, and the mechanism connected therewith and with the escapement-wheel of the clock-movement, and consisting of the wire *h*, spring *d*, projection *e*, and stud *c*, all being adapted and for use substantially and for the purpose as set forth.

MAJOR DANE PORTER.

Witnesses:

R. H. EDDY,
E. B. PRATT.