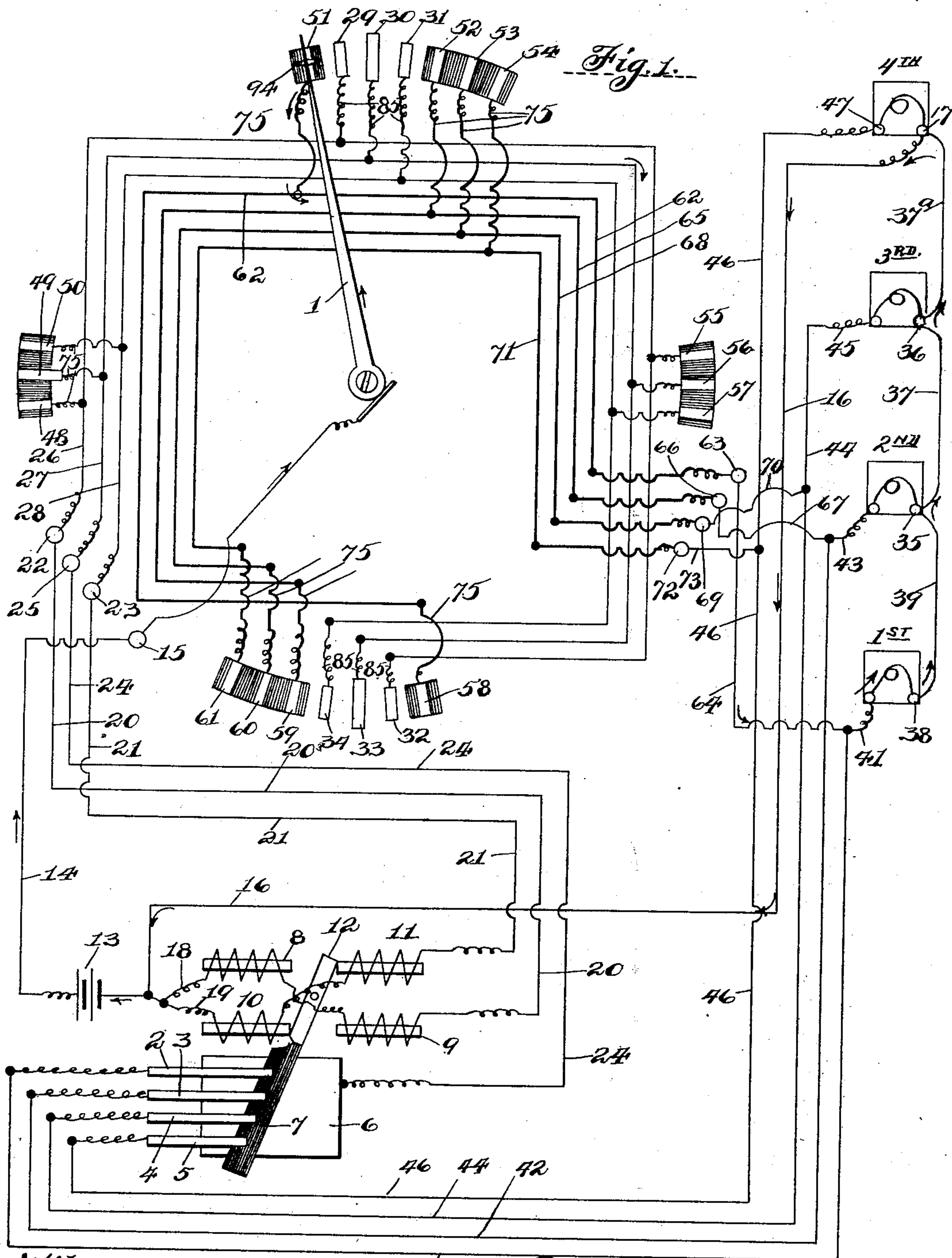


E. T. ACKERMAN.
ELECTRIC TIME ALARM SYSTEM.

APPLICATION FILED OCT. 4, 1901.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:
Chas. D. Barry
J. B. Weir

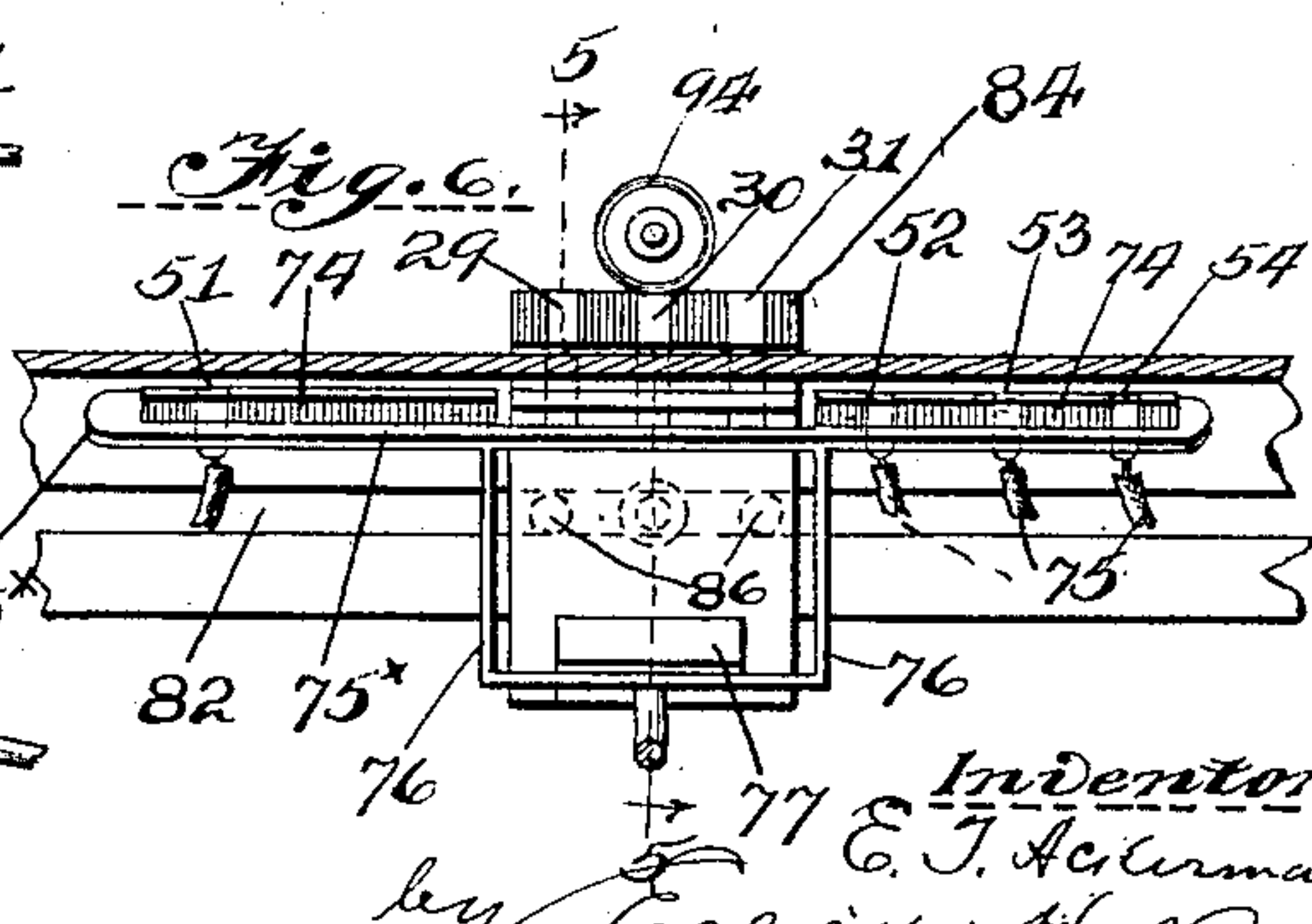
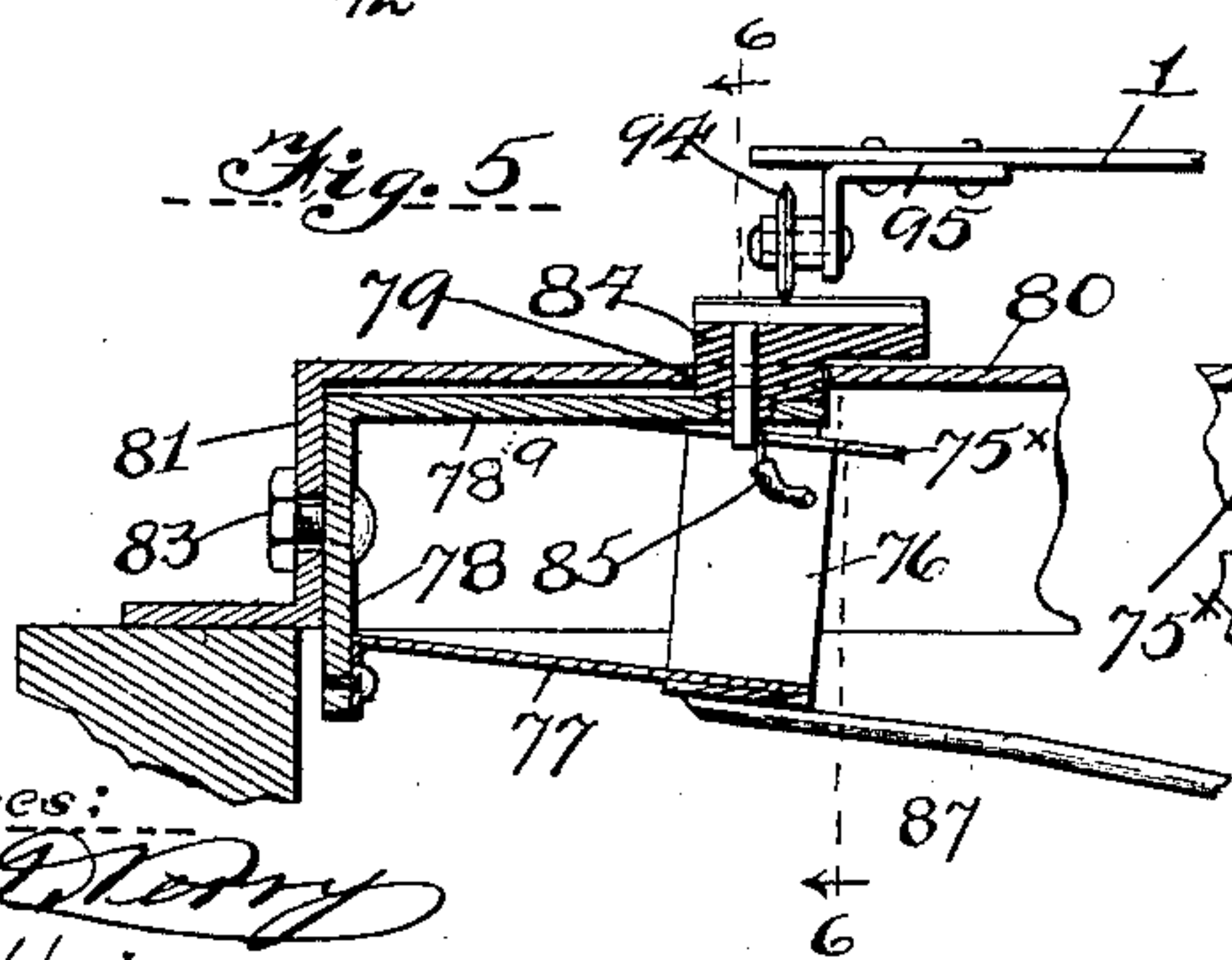
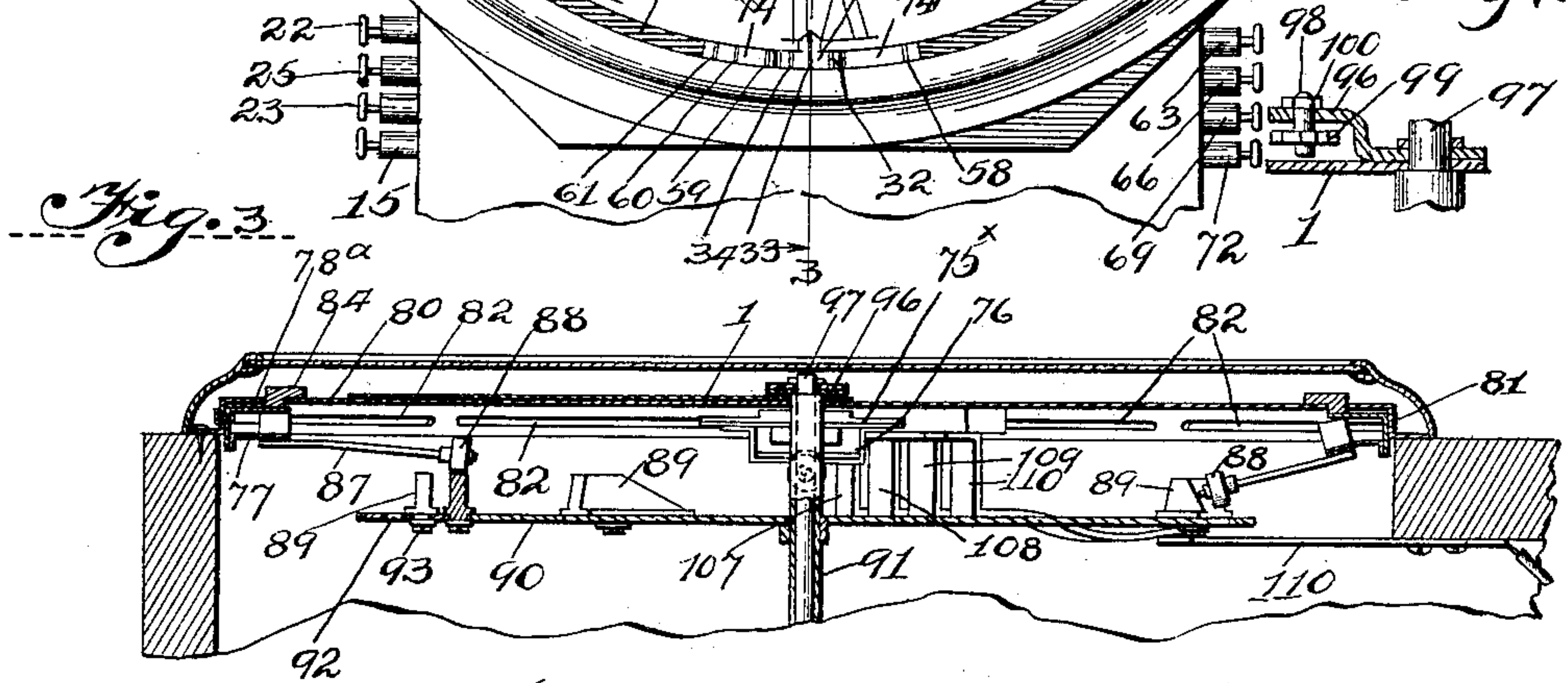
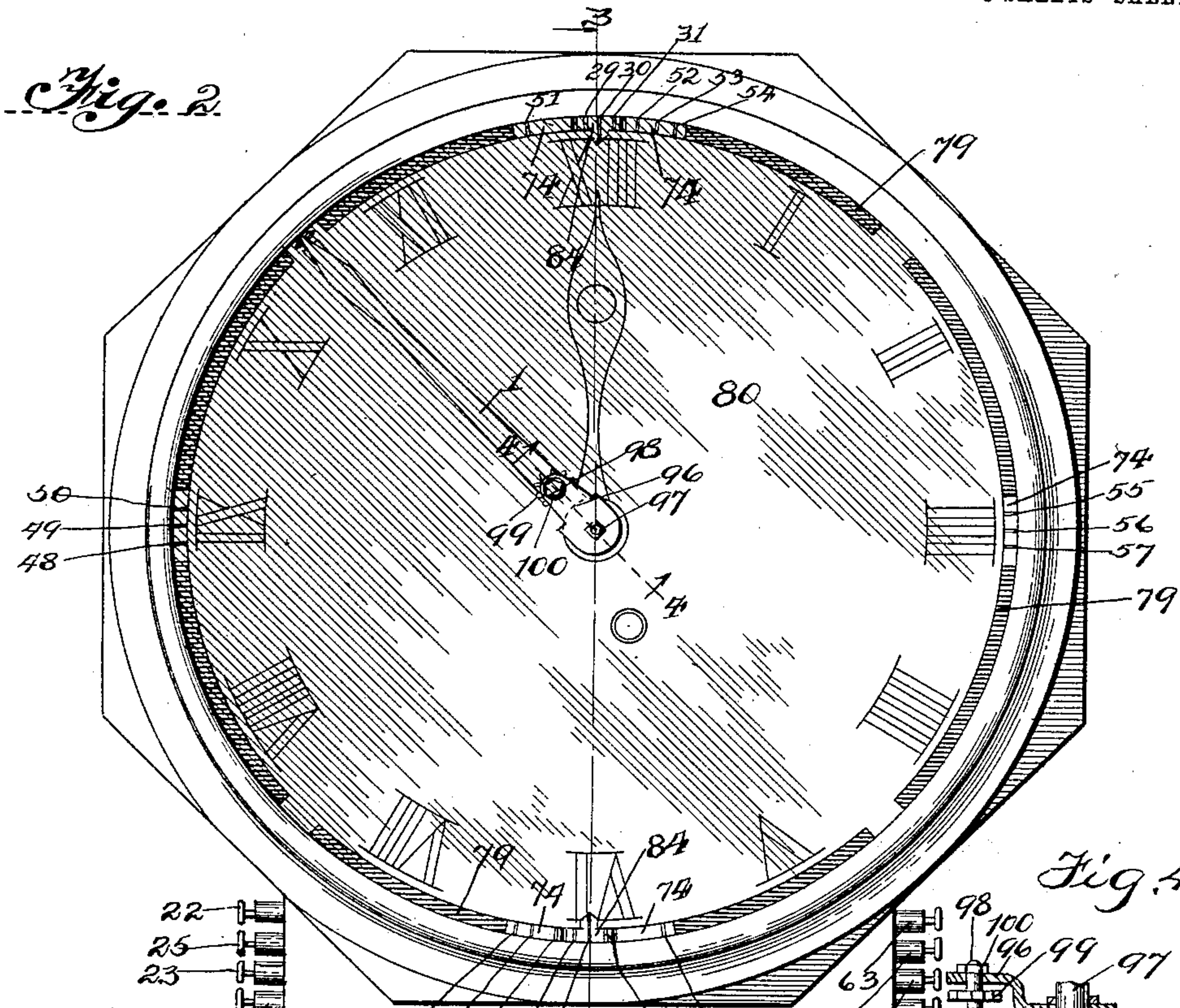
40 *E. T. Ackerman* Inventor:
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E. T. ACKERMAN.
ELECTRIC TIME ALARM SYSTEM.

APPLICATION FILED OCT. 4, 1901.

NO MODEL.

3 SHEETS—SHEET 2.



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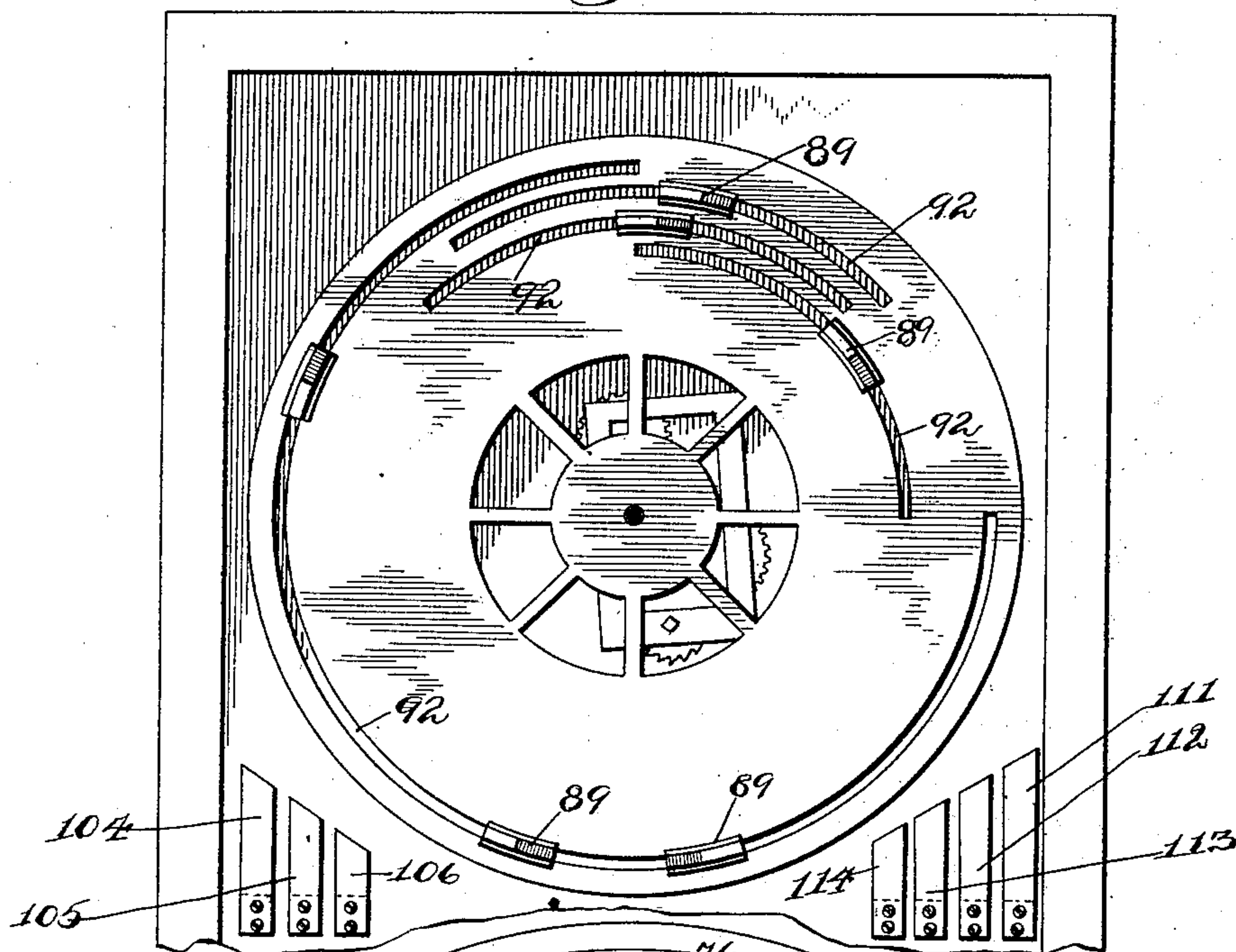
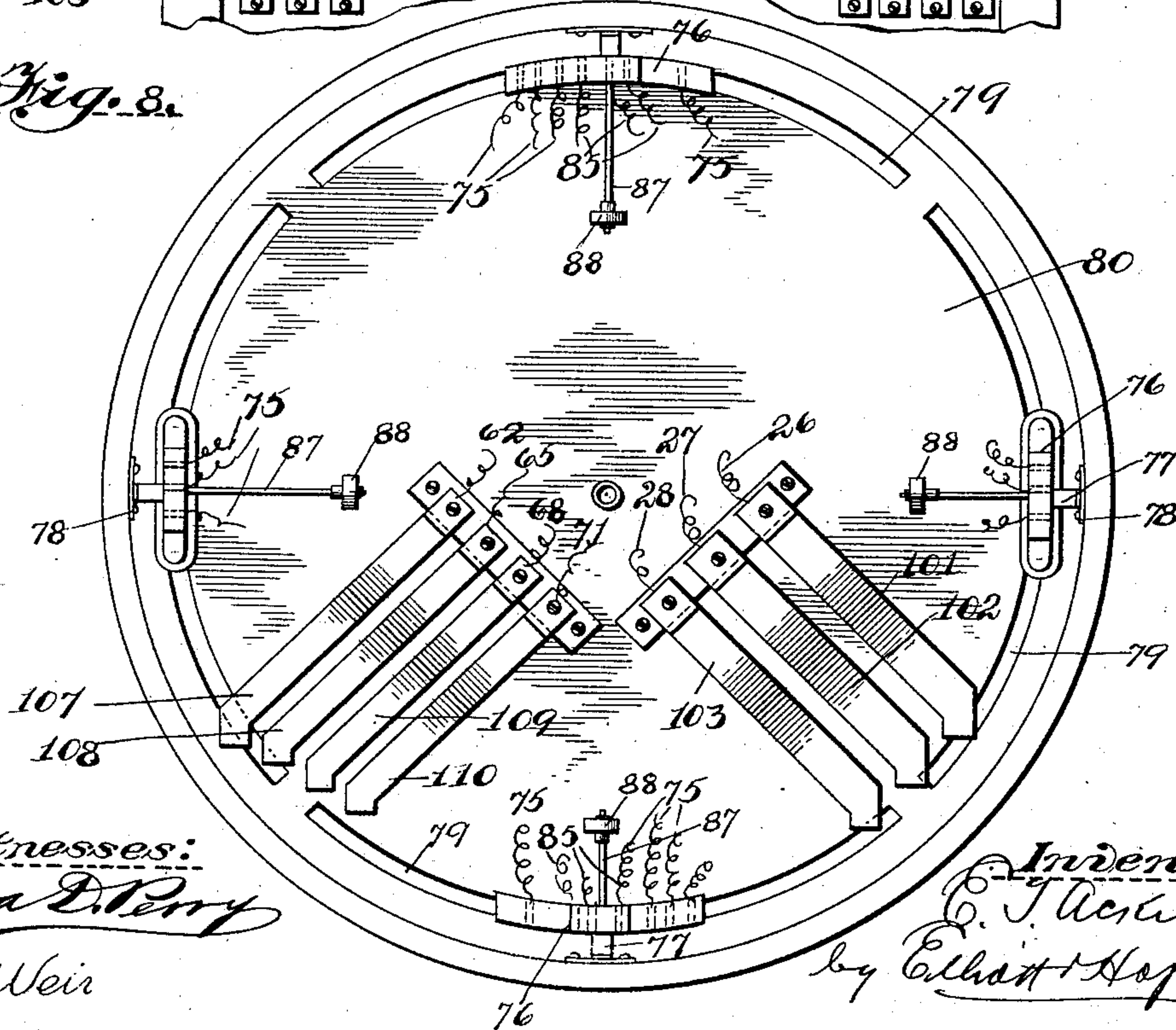
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E. T. ACKERMAN.
ELECTRIC TIME ALARM SYSTEM.

APPLICATION FILED OCT. 4, 1901.

NO MODEL.

3 SHEETS—SHEET 3.

Fig. 7.*Fig. 8.*

Witnesses:

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J. B. Weir

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E. T. Ackerman
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UNITED STATES PATENT OFFICE.

EDWIN T. ACKERMAN, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO
THOMAS A. SMYTH, OF CHICAGO, ILLINOIS.

ELECTRIC TIME-ALARM SYSTEM.

SPECIFICATION forming part of Letters Patent No. 719,551, dated February 3, 1903.

Application filed October 4, 1901. Serial No. 77,510. (No model.)

To all whom it may concern:

Be it known that I, EDWIN T. ACKERMAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electrical Alarm Systems, of which the following is a full, clear, and exact specification.

My invention relates to electrical alarm systems for sounding alarms automatically at predetermined periods; and it has for its primary object to provide improved and simple means whereby all or any one of a series of different alarms may be sounded automatically at certain periods.

With these ends in view my invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a diagrammatic illustration of my improved system. Fig. 2 is a face view of the clock. Fig. 3 is a transverse sectional view thereof, taken on the line 3 3, Fig. 2. Fig. 4 is an enlarged detail sectional view taken on the line 4 4, Fig. 2. Fig. 5 is an enlarged transverse section taken on the line 5 5, Fig. 6. Fig. 6 is a section taken on the line 6 6, Fig. 5. Fig. 7 is a plan view of the cam-disk hereinafter described, the face and the dial being removed; and Fig. 8 is a bottom view of the dial-plate and connected parts hereinafter described.

In illustrating my invention in the accompanying drawings I have shown it adapted for the ringing of alarms in systems where it is desirable to ring one or more alarms one or more times every hour and one or more alarms or the same alarm one or more times at longer intervals during the day—such, for example, as the systems used in school-buildings, where it is the custom to ring an alarm on each of several floors a certain period before nine o'clock in the morning or other hour at which school begins for the teachers to assemble at their respective posts; to again sound the alarms at nine o'clock or the hour for the beginning of the session for the pupils to as-

semble at their desks; to thereafter sound any one or all of a number of alarms every half hour or other fraction of an hour during the day for the various classes to assemble in the class-room; to sound different alarms for different grades at intervals of a few minutes apart to prepare for and take recess or to prepare and adjourn for the day. My invention will be described with reference to this adaptation thereof as an example of the many obvious uses to which it might be put.

Referring first to the diagrammatic illustration in Fig. 1, 1 is the minute-hand or other continuously-moving member of clock mechanism. (Not indicated in this figure.) The devices marked "1st," "2nd," "3rd," "4th" represent, respectively, the alarms on the first, second, third, and fourth floors of a school building—for example, 2 3 4 5 are switches or switch members adapted to contact with a contact-plate 6, common to all of them. 7 is a cut-out switch of any suitable construction. 8, 9, 10, and 11 are magnets of a switch-actuating mechanism controlling a pivoted armature 12, which moves the cut-out switch 7, and 13 is a battery or other suitable source of electrical energy. One pole of the battery 13 is actuated by conductor 14 with the moving member or minute-hand 1 of the clock mechanism, the conductor 14 being connected with binding-post 15 before entering the clock mechanism. The other pole of the battery 13 is connected by conductor 16 to the negative or outgoing terminal 17 of the fourth alarm, and it is also connected by branch terminals 18 19 with the coils of magnets 8 10, respectively, whose coils are also connected with the coils of magnets 9 11, respectively, and the latter coils are connected by conductors 20 21, respectively, with binding-posts 22 23, while the contact-plate 6 is connected by conductor 24 with the remaining one, 25, of the binding-posts in this group, and these three binding-posts 22 25 23 are connected, respectively, with conductors 26 27 28, which are respectively connected with fixed contacts 29 30 31 at one point in the line of travel or defined course of movement of the hand or member 1 and with fixed contacts 32 33 34 at another point in such line of travel. The outgoing terminals 35 36 of the second

and third alarms, respectively, are connected together by a conductor 37. The terminal 35 is connected to the outgoing terminal 38 of the first alarm by a conductor 39 and the
 5 terminal 36 of the third alarm to the outgoing terminal 17 of the fourth alarm by conductor 37^a. Switch-contact 2 is connected by conductor 40 to the ingoing terminal 41 of the first alarm, contact 3 by conductor 42
 10 to ingoing terminal 43 of the second alarm, contact 4 by conductor 44 with ingoing terminal 45 of the third alarm, and contact 5 by conductor 46 with outgoing terminal 47 of the fourth alarm.

15 In the example of the invention shown in the drawings the fixed contacts 29 30 31 are situated at the twelve-o'clock number on the dial of the clock and fixed contacts 32 33 34 at the six-o'clock number, so that the minute-hand 1 will pass these contacts at intervals of about thirty minutes apart. When
 20 it reaches fixed contact 29, it will be seen that the circuit will be closed through the battery, passing along conductor 14 to the hand 1, thence into contact 29, then passing along conductor 26 to binding-post 22, thence into the conductor 20 to the magnets 9 and 8, and through line 18 to the battery, thus energizing
 25 magnets 8 9 and pulling the cut-out switch 17 from under all of the switch members or contacts 2 3 4 5, thereby allowing them to press against contact 6 and placing conductor 24 in communication with all of the
 30 conductors 46 44 42 40 and completing the alarm-circuit at the automatic switch in readiness for the passage of the current as soon as minute-hand 1 shall have reached alarm-contact 30, and when it reaches the latter contact it will be seen that the current will proceed
 35 through conductor 14 to hand 1 and thence along 30 27 25 24, 6 2 3 4 5, 46 44 42 40, and to the ingoing terminals 41 43 45 47 of the first, second, third, and fourth alarms, respectively, the current returning from the alarms
 40 via conductor 16 to the negative pole of the battery, thus sounding all of the alarms simultaneously. When the minute-hand 1 reaches contact member 31, which is the cut-out contact, the current proceeds along conductor 14 to the hand 1 and thence through
 45 31, 28, 23, and 21 to the magnet-coils 11 10 and from the coil 10 via conductor 19 to the negative pole of the battery, thus energizing the two said coils and throwing the cut-out switch 7 into the position shown in Fig. 1, whereby all of the switch-contacts 2 3 4 5 are
 50 insulated from contact-plate 6.

The operation above described will be repeated at the expiration of thirty minutes or
 55 when the minute-hand 1 reaches and passes fixed contacts 32 33 34, which are, like the contacts 2 30 31, for respectively cutting into circuit all of the alarms, then ringing the alarms, and finally cutting out the alarms.

60 The described mechanism has been put to the use of ringing the alarms on all of the floors simultaneously at intervals of about

thirty minutes apart for the various classes to assemble in the lecture-hall or class-room, as well as for signaling the hour of the beginning of the session, the hour of recess, and the conclusion of recess; but it is obvious that the mechanism might be used for other
 70 purposes.

48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 75 60, and 61 are all floating contacts or contacts which for a part of the time are out of the path or line of movement of the member 1 and at another part are brought into the path of such member, so as to contact therewith
 80 at certain intervals during the day. The action of these contacts and the circuits controlled thereby will first be described, and the mechanism by which they are actuated, as explained, will then be specifically described
 85 with reference to Figs. 2 to 8, inclusive, of the drawings. These contacts last referred to are so constructed and arranged that they will automatically recede out of reach of the hand 1. The first three, 48 49 50, are situated at
 90 the "quarter-of" point in the line of movement of the minute-hand and they are connected, respectively, with the conductors 26, 27, and 28, and the contacts 55 56 57 are situated at the quarter-of point in the line of
 95 movement of the hand 1 and are also respectively connected with the conductors 26 27 28, it being understood that contacts 48 49 50 are supported as a group and moved collectively and the contacts 55 56 57 are similarly supported and moved. When the minute-hand
 100 1 reaches the contact 48, a suitable automatic mechanism (which will be hereinafter described) raises the group of contacts of which that one constitutes a member once a day or once every twelve hours. In the example
 105 shown in the drawings it is supposed to thus act at fifteen minutes of nine o'clock, whereupon the circuit will be closed through conductor 14, hand 1, contact 48, conductor 26, and conductor 20 to magnets 9 8 and thence to the battery through conductor 18, thereby energizing magnets 9 8 and throwing all of the contacts 2 3 4 5 into connection with contact 6. When hand 1 reaches contact 49, the
 110 circuit will be closed through 14 1 49 27 25 24 6 and 2 3 4 5 to the conductors 40 42 44 46, respectively, which carry the current to the first, second, third, and fourth alarms, respectively, via their terminals 41 43 45 47, and the current returns to the battery through outgoing terminal 17 of the fourth alarm via conductor 16. Thus all of the alarms on the various floors are sounded for the teachers to assemble at their respective
 115 posts or for any other desired purpose. When the hand 1 reaches contact 50, the circuit will be closed through 14, 1, 50, 28, and 21, the coils 11 10 of the magnets, and conductor 19, thereby energizing magnets 10 11 and cutting
 120 out contacts 2 3 4 5. The same operation will be repeated later on in the day when the hand 1 passes contacts 55 56 57 and the latter are raised into its path by automatic

mechanism hereinafter described. This latter group of contacts 55 56 57 is situated, as before described, at the "quarter-after" point. In this particular adaptation of the invention they are supposed to serve for first cutting in all of the alarms, then sounding them simultaneously, and finally cutting them out at 1.15 o'clock as a signal for certain classes; but they may be arranged in such a way as to sound the alarm at any other time or for any other purpose, this being a mere illustration of the adaptability of the invention for sounding alarms at different periods, depending upon the relative positions of the minute and hour hands of the clock.

Contact 51 is supposed to be mechanically connected or supported with contacts 52 53 54 and belongs to the same group, and this group 51 to 54 is situated at the twelve-o'clock point on the dial. The contact 51 is connected to conductor 62, which leads to binding-post 63, and is connected by conductor 64 to the ingoing terminal 41 of the first alarm. Contact 52 is connected by conductor 65 to binding-post 66, which is connected by conductor 67 with ingoing terminal 43 of the second alarm. Contact 53 is connected by conductor 68 to binding-post 69, which is connected by conductor 70 to ingoing terminal 45 of the third alarm via conductor 44, and contact 54 is connected by conductor 71 to binding-post 72, which is connected by conductor 73 to the conductor 46, which leads to the ingoing terminal 47 of the fourth alarm.

Contact 58, which, like the contact 51, is placed in advance of the cut-in contact, is connected to conductor 62, and the contacts 59 60 61, which are arranged successively after the fixed cut-out contact 34 in the same way that contacts 52 53 54 are arranged after fixed cut-out contact 31, are, like the contacts 52 53 54, connected to conductors 65 68 71, respectively.

In large school-buildings, where there are mixed classes, it is desirable to dismiss the classes containing the smaller children in advance of the others in order to avoid confusion and injury to the little ones, an alarm being first sounded for the smaller children to get ready and a second alarm for them to go, the latter alarm being a signal for the other classes to make ready, and a third alarm being sounded to the other classes to go. I have shown my invention adapted for this purpose. When the minute-hand 1 arrives at a minute or two before twelve o'clock, the automatic mechanism before referred to and which will be hereinafter explained forces contacts 51 52 53 54 into the line of movement, so as to engage with the hand 1, and when the hand touches contact 51 the circuit is closed through 14 1 51 62 63 64 41, the first alarm, the conductors 39, 37, 37^a, 17, and 16, back to the battery, thus sounding the first alarm independently of the others. When the hand 1 reaches contact 29, which is the cut-in contact, the automatic switch mechanism

before described will throw into circuit all of the contacts 2 3 4 5, as previously explained, and when the hand reaches the alarm-contact 30 all of the alarms will be sounded, as before explained, thus giving a signal for the pupils on the first floor or in the minor grades to depart and for the pupils of the upper floors to prepare. When the hand touches contact 31, the automatic switch will cut out all of the contacts 2 3 4 5, and consequently when it arrives at and touches contact 52 the circuit will be closed through 14 1 52 65 66 67 43 and the second alarm and will return to the battery via conductors 37, 37^a, and 16, thus sounding the alarm on the second floor in exclusion of the others for the second grade to depart. When the minute-hand 1 reaches contact 53, the circuit will be closed through 14 1 53 68 69 70 44 45 and the third alarm and will return from the latter to the battery via conductor 37^a, terminal 17, and conductor 16, thereby ringing the third alarm in exclusion of the others, and when contact 54 is reached by hand 1 the circuit will be closed through 14 1 54 71 72 73 46 47 and the fourth alarm and will return from the latter alarm to the battery via 16, thus ringing the fourth alarm in exclusion of the others.

The operation described with reference to contacts 51 52 53 54 will be repeated, according to the particular example of the invention shown in the drawings, when the minute-hand 1 arrives at the half-hour point on the dial, and the described sounding of the alarms may be utilized at this time for the proper and orderly assembling of the various grades or for any other purpose, it being understood that the contacts 58, 59, 60, and 61 are mechanically connected together and are moved in unison into the path of the hand 1 at the proper time by automatic mechanism, which, together with the mechanism which operates the other groups of movable contacts, will now be explained. Inasmuch as all of the movable contacts are supported and actuated by similar means, the description of one group will suffice for all, the groups 51, 52, 53, and 54 being taken for example. These contacts are embedded in a block 74, composed of any suitable insulating material, and are connected by electrical connections with their respective conductors, already described. The blocks 74 are supported by a plate 75^x, which is secured to a yoke 76, and this in turn is supported by a spring 77, secured to a bracket 78. The blocks 74 are adapted to be projected upwardly through circumferential slots 79, formed in the dial or face 80, when the springs 77 are deflected upwardly and the edge of the dial is turned downwardly in the form of a peripheral flange 81, whose edge is provided with a number of slots 82, arranged coterminously with the slots 79, so that by means of a set-bolt 83, passing through bracket 78 and slot 82, the bracket may be supported on the dial and be capable of adjustment around the same, whereby the

contacts may be shifted for varying the time of the sounding of the alarms to suit the circumstances of the particular use to which the invention is put. In order that the fixed contacts 29, 30, 31, 32, 33, and 34 may be adjusted simultaneously with the movable contacts to which they are related, said fixed contacts are also supported upon the bracket 78, they being embedded in a block 84 of insulating material, which projects through slot 79 and is secured to the horizontal part 78^a of bracket 78, 85 being the electrical connections which establish communication between contacts 29 30 31 and their respective conductors. Where the fixed contacts 29 30 31 or 32 33 34 are used in connection with and interposed between the movable contacts, the yoke 76 is utilized for straddling block 84, and the fixed contacts to such yoke would of course have no function other than a mere support where used in connection with the movable contacts on the sides only.

86 represents guide-pins secured to bracket 78 and engaging in slot 82 for holding the bracket upright and in proper position while being adjusted along the slot. Each of the yokes 76 is provided with an arm 87, on the end of which is journaled an antifriction-roller 88, and these antifriction-rollers are engaged by cams 89, secured to a revolving disk or other suitable support 90, which is driven by a suitable connection with the arbor 91 of the hour-hand. The cams 89 are adjustably secured in circular slots 92, formed in the disk 90, so that they may be adjusted relatively to each other, whereby the time at which they will engage and deflect the antifriction-rollers 88 may be varied to suit the requirements of the particular use to which the invention is put, it being understood from the explanation already given that these cams force the movable contacts outwardly into engagement with the hand 1 at the hour of the day when it is desired the alarm or alarms controlled by such movable contacts shall be sounded. The cams 89 may be held in their slots 92 in any suitable way—such, for example, as set-screws 93, threaded in the under or inner sides thereof and clamping them to the plate or disk 90. The hand 1 is provided with a revoluble trolley 94, which may be secured thereto in any suitable way. As shown in Fig. 5, the hand is provided with a small bracket 95, in the downwardly-projecting angle of which the trolley 94 is journaled, so as to impinge the various contacts in its path as the hand revolves.

96 is a bracket secured to the minute-arbor 97 over the hand 1 and is bent upwardly and carries a set-screw 98, which impinges the hand 1 for forcing it inwardly, and thereby holding trolley 94 in firm engagement with the contacts over which it passes.

99 is a milled head by which set-screw 98 may be turned, and 100 is a jamb-nut locking the set-screw when adjusted.

The wiring has been purposely omitted from Figs. 2 to 8, inclusive, of the drawings for the sake of avoiding confusion; but it will nevertheless be understood that the three wires 26 27 28 are connected with the contacts carried by the brackets 78 in the manner before described and have their terminals attached to some suitable conductors for making the electrical connections on the exterior of the clock-case. In Fig. 8 these wires are shown secured to contact-springs 101, 102, and 103, respectively, which when the face 80 is put in place project inwardly against contact-springs 104, 105, and 106, respectively, and these latter are respectively connected with the binding-posts 22 25 23. The terminals of the wires 62 65 68 71 are respectively secured to contact-springs 107 108 109 110, which, like the springs 101 102 103, are carried on the under side of dial 80, and when the dial is put in place they project inwardly and contact with springs 111, 112, 113, and 114, respectively, which are respectively connected with binding-posts 63, 66, 69, and 72.

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

1. In an electric-alarm system the combination of an electric-alarm circuit, a clock mechanism having a moving member forming a part of said circuit, an alarm-contact for said member forming a part of said circuit, an alarm included in said circuit, a switch included in said circuit, a cut-in contact with which said member connects, a switch-circuit including said cut-in contact and member, a switch-actuating mechanism included in said switch-circuit for opening and closing said alarm-circuit, substantially as set forth.

2. In an electric-alarm system the combination of an electric-alarm circuit, a clock mechanism having a moving member forming part of said circuit, an alarm-contact for said member forming a part of said circuit, an alarm included in said circuit, a switch included in said circuit, a cut-in contact with which said member connects, a switch-circuit including said cut-in contact and member, switch-actuating mechanism included in said switch-circuit for opening and closing said alarm-circuit, a cut-out contact with which said member connects and a cut-out circuit including said cut-out contact, said member and said switch-actuating mechanism, substantially as set forth.

3. In an electric-alarm system the combination of an electric-alarm circuit, a clock mechanism having a moving member forming part of said circuit, an alarm-contact for said member forming a part of said circuit, an alarm included in said circuit, a switch included in said circuit, a cut-in contact with which said member connects, a switch-circuit including said cut-in contact and member, a switch-actuating mechanism included in said switch-circuit for opening and closing said switch, a

cut-out contact, a cut-out circuit including said cut-out contact, said member and said switch-actuating mechanism and a second set of cut-in, alarm and cut-out contacts included in said cut-in, alarm and cut-out circuits respectively and arranged in the path of said moving member in the order named, substantially as set forth.

4. In an electric-alarm system the combination of an electric-alarm circuit, a clock mechanism, a member driven thereby in a defined course and constituting part of said circuit, a series of successively-arranged alarm-contacts movable out of the path of said member, an alarm included in said circuit, and a series of devices driven by said clock mechanism for respectively throwing said contacts into the path of so as to engage with said moving member, said devices being arranged out of line with each other, but in line with

their said respective alarm-contacts, substantially as set forth.

5. In an electric-alarm system the combination of an electric-alarm circuit, a clock mechanism having a moving member included in said circuit, a bracket adjustable lengthwise of the line of movement of said member, fixed and depressible contacts carried by said bracket and adapted to be engaged by said moving member, means moving with said clock mechanism for engaging and deflecting said depressible contacts into engagement with said moving member, said contacts being included in said alarm-circuit, substantially as set forth.

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Witnesses:

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