

(No Model.)

3 Sheets—Sheet 1.

T. McCoubRAY.  
INTERIOR TELEPHONE SYSTEM.

No. 516,506.

Patented Mar. 13, 1894.

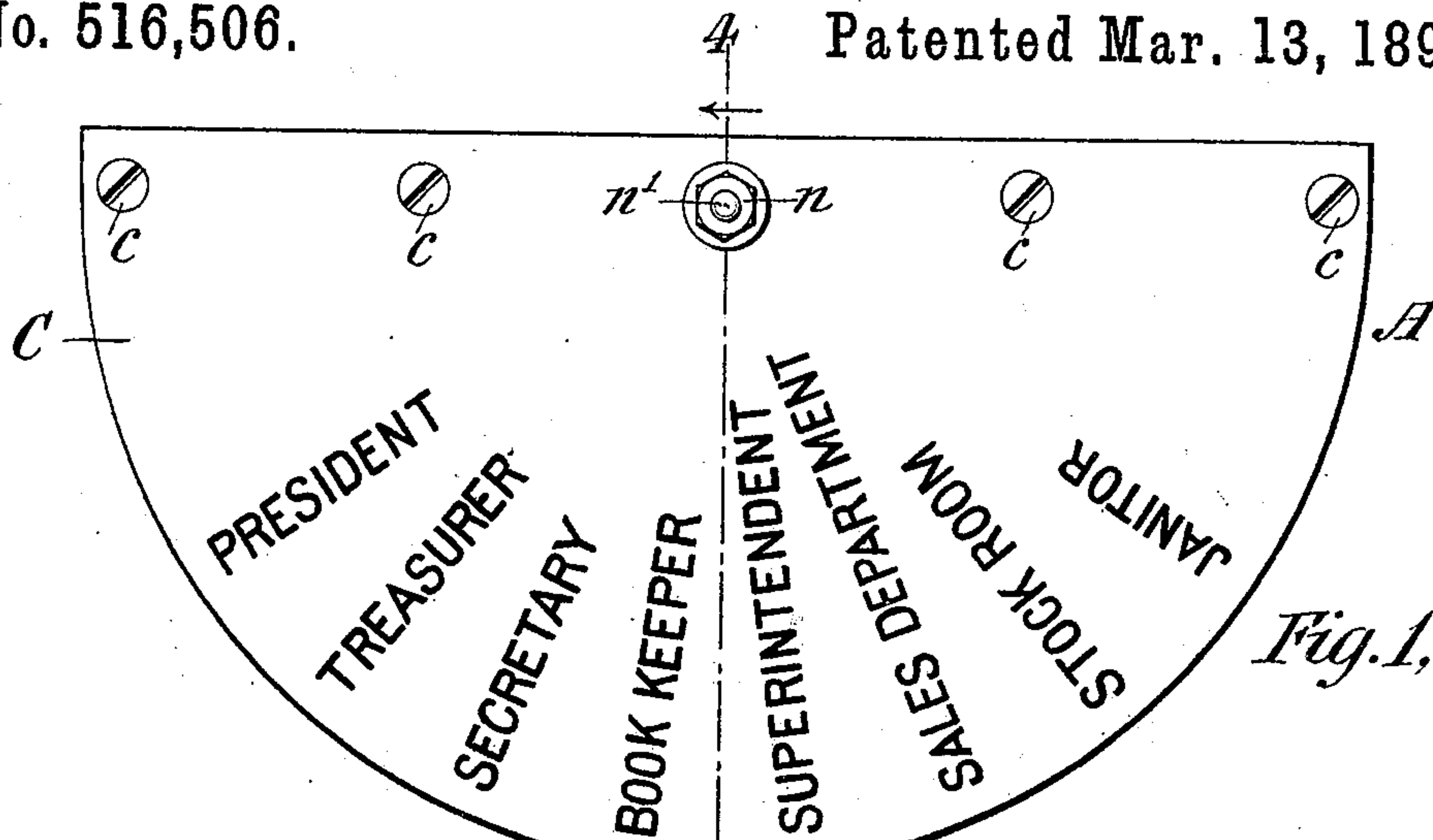


Fig. 1,

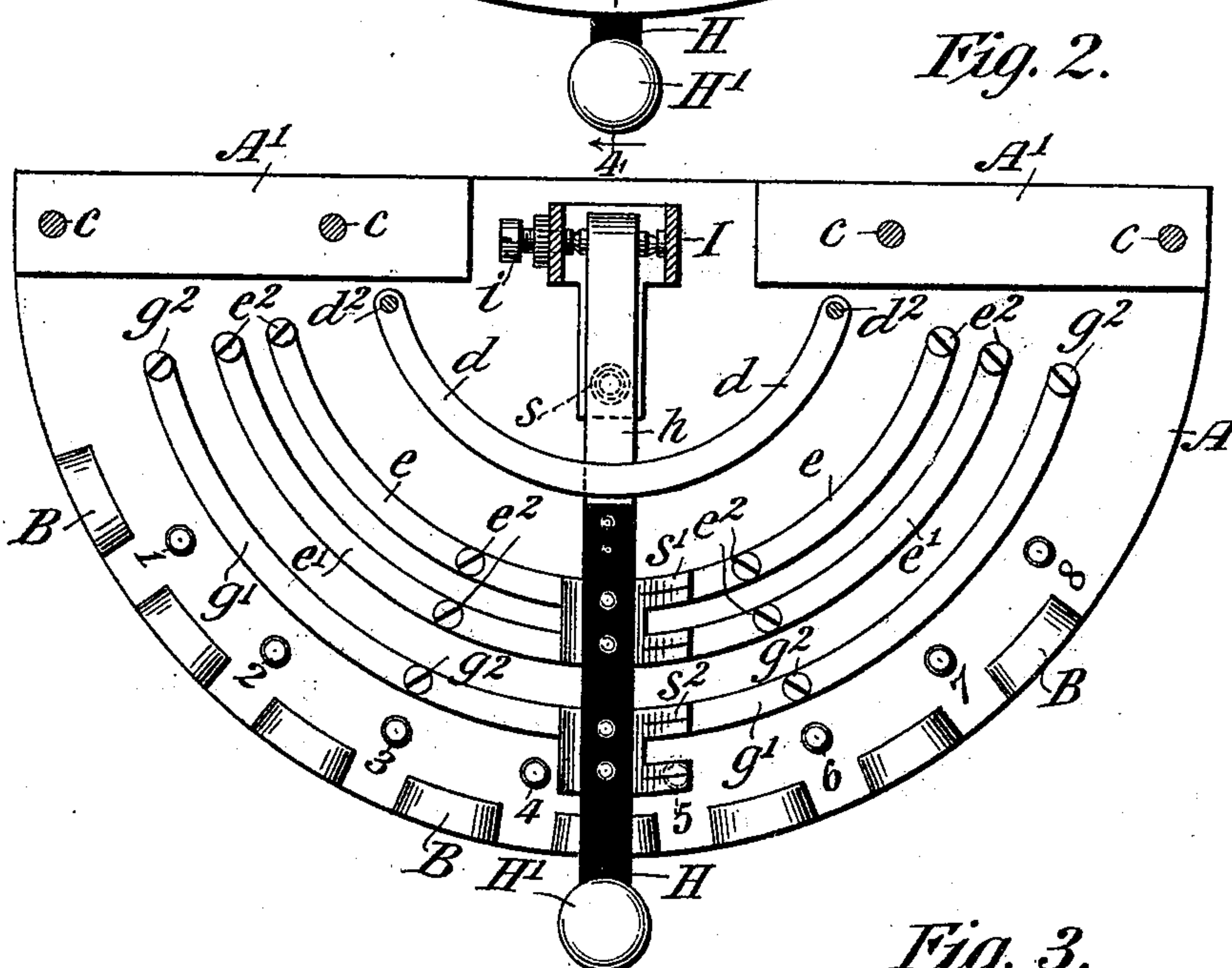


Fig. 2.

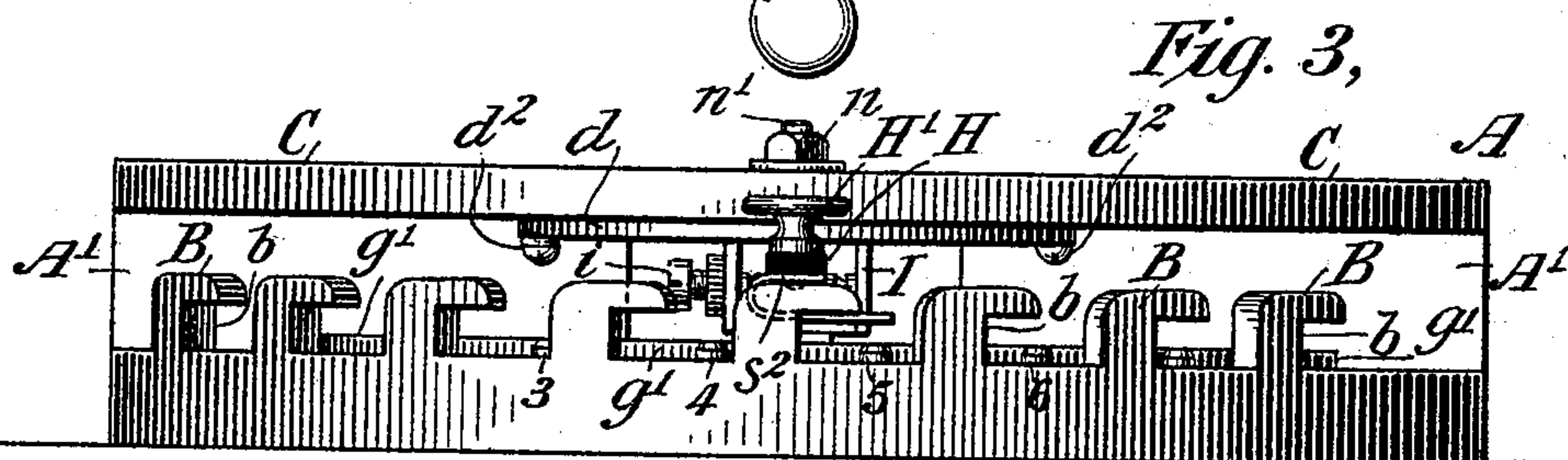
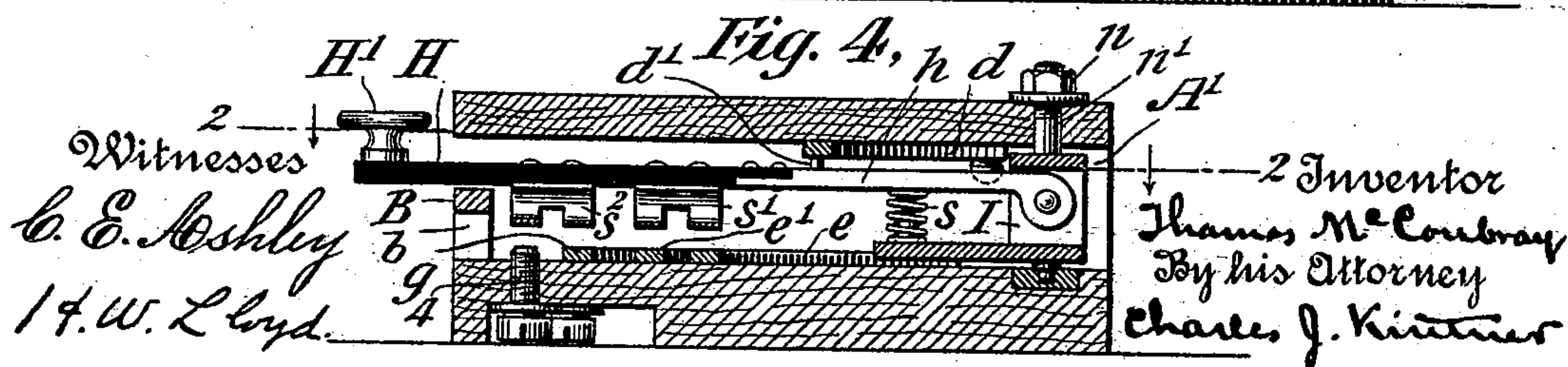


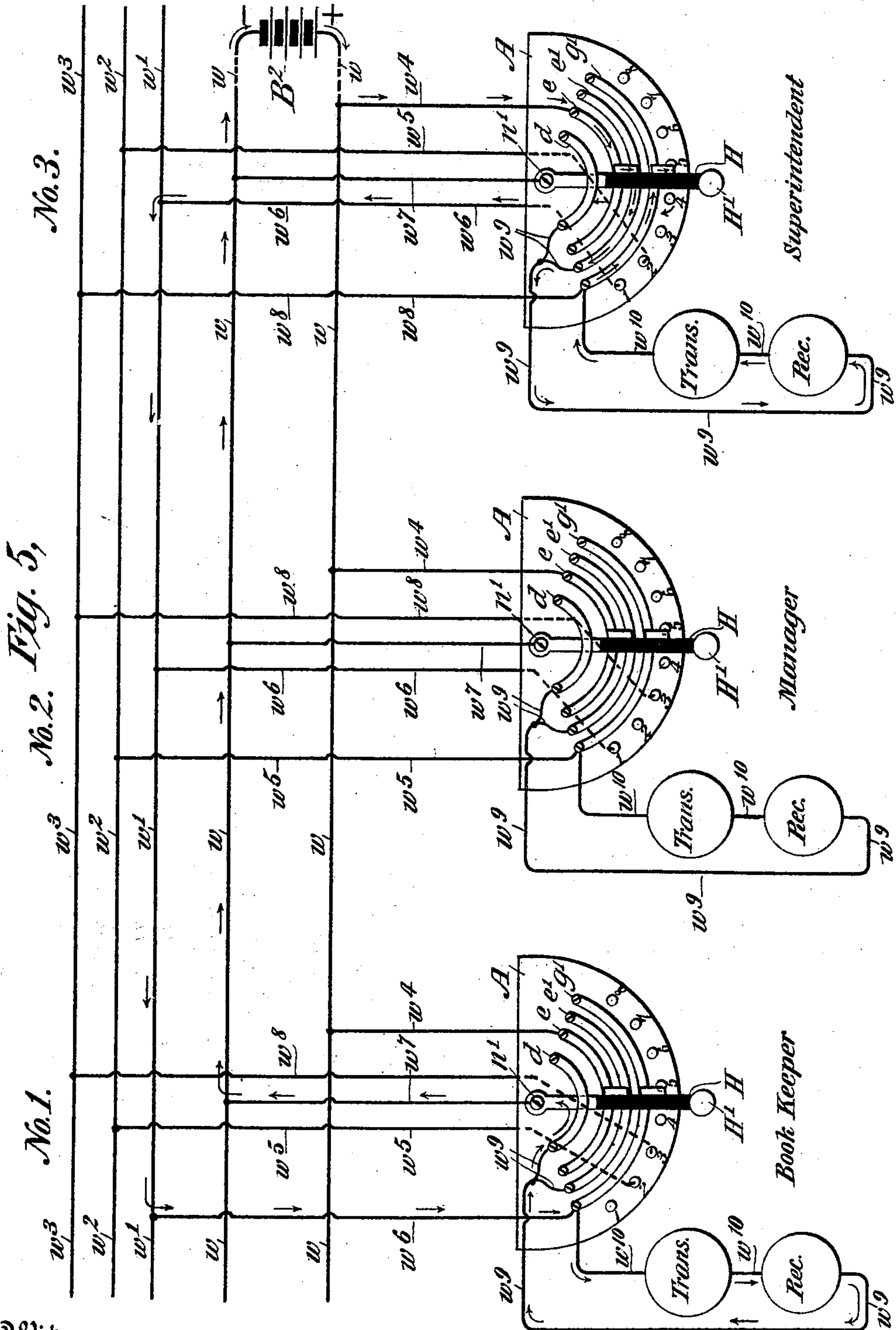
Fig. 3,



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Witnesses  
C. E. Ashley  
14. W. Lloyd.

Inventor  
By his Attorney Thomas M. Coubray  
Charles J. Kintner



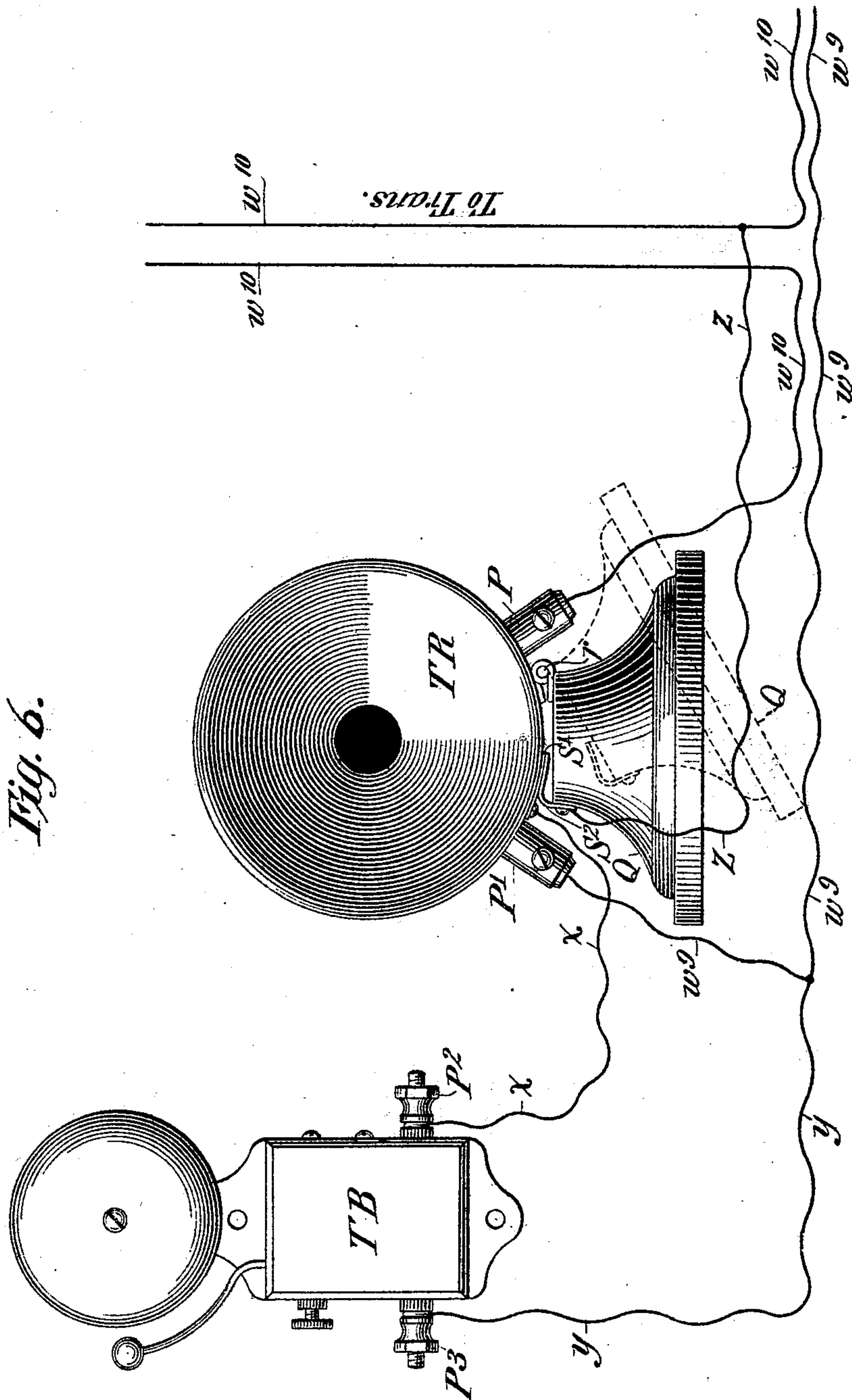
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3 Sheets—Sheet 3.

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Witnesses  
*C. E. Ashley*  
*H. W. Lloyd*

Inventor  
By his Attorney *Thomas McCoubrey*  
*Charles J. Kintner*



# UNITED STATES PATENT OFFICE.

THOMAS MCCOUBRAY, OF NEW YORK, N. Y.

## INTERIOR TELEPHONE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 516,506, dated March 13, 1894.

Application filed December 4, 1893. Serial No. 492,669. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS MCCOUBRAY, a citizen of the United States, residing at New York, in the county of New York and State of New York, have made a new and useful Invention in Systems of Telephonic Inter-communication, of which the following is a specification.

My invention is directed particularly to improvements in that type of telephone systems wherein each operator or user of the apparatus is, by the arrangement of circuits and interconnecting apparatus, enabled to instantly put his own instruments into connection with those of any other operator or user of the same system, and its objects are: First, to so simplify the arrangement of circuits switching and calling apparatus that a minimum amount of battery is used and to so locate this battery or equivalent source of electrical energy that it may be readily examined cleaned or repaired; thereby greatly decreasing the cost of the operation of the plant and correspondingly increasing its efficiency. Second, to so simplify the calling or signaling apparatus that little liability of mistakes in signaling will occur and that the apparatus will be compact in structure and easily comprehended by any persons even though not at first conversant with its mode of operation. Third, to provide a simple cheap and efficient means for switching the call bells and the telephone transmitters and receivers alternately into and out of circuit. These objects are fully attained by the apparatus hereinafter described, the especial features of novelty being particularly pointed out in the claims at the end of this specification.

Referring now to the drawings: Figure 1 is a plan view of one of my improved signaling keys designed for use in a system of nine operators or users. Fig. 2 is a similar view of this portion of the apparatus as it appears with the top plate or cover removed. Fig. 3 is an end view of the same portion of the apparatus as seen looking at Fig. 1 from the bottom toward the top of the sheet. Fig. 4 is a sectional view taken through Fig. 1 on the line 4—4 and as seen looking in the direction of the arrows from the right to the left side of the drawings. Fig. 5 is a dia-

grammatic view illustrating the circuit connections, signaling keys and telephone transmitters and receivers for a system comprising three users' instruments complete. Fig. 6 is part elevational part diagrammatic view of a novel switch for transferring the circuit from the call bells to the transmitters and receivers and vice versa.

In Figs. 1 and 2, A is a base plate of wood, hard rubber or other insulating material and is preferably of quadrant or semi-circular shape dependent upon the number of users, or operators' circuits.

A' A' are wooden strips or blocks secured to the base plate A by screws *c, c, c, c*, which also hold a lid or cover C in place, the free edge of said lid being of circular contour corresponding to that of the base plate.

H is a key lever made in two parts, the inner part *h* being of metal while the outer part is of insulating material and carries two sets of bridging contact plates *s' s²* and a key knob H'. This key is pivotally secured through a plate or standard I and pivot rod or bolt *n'* to the base A so as to admit of lateral motion in either direction and is secured to the standard by screw trunnions *i* after the manner of pivoting Morse keys.

*s* is a retractile spring resting on the plate I and under the key lever, its function being to hold this lever in its upper position against the under side of a curved metal contact plate *d* secured to the base plate A by screws or pins *d² d²*.

*e, e', g'* are contact plates of curvilinear form secured to the base plate A by screws *e² e², g² g²*.

1, 2, 3, 4, 5, &c., to 8 are conducting contacts connected each directly to a user's wire as will be described more particularly in connection with the description of Fig. 5.

B, B, B, &c., are hook like extensions of the front edge of the base plate A having notches *b, b, b, &c.*, the function of which is to hold or retain the key lever H in its depressed position when placed over a signaling contact point as will be explained in connection with the description of the mode of operation.

It will be seen on examination of Fig. 1 that the titles of the different persons to be called are indicated upon the top plate or cover C of each instrument; such an arrange-



ment being advantageous in large business houses or on board vessels or in analogous places where the system is adapted for use.

Referring now to Fig. 5, I will describe the circuit relations of a system of three sets of users' instruments as there illustrated, it being obvious that for any larger number of instruments a mere duplication of circuit connections is made for each additional set of instruments.

$B^2$  is a battery or other equivalent source of electrical energy located at any preferred point in the system, and  $w w$  are feeders or conducting leads or wires extending from opposite poles of the battery throughout the building or system to points accessible to all users' instruments. One of these wires  $w$  might be dispensed with in a building or system where gas or steam pipes are accessible or on shipboard where the vessel is made of iron; or, an earth circuit might supplant it as will be fully understood by those skilled in the art.

$w', w^2, w^3$  are individual users' or operators' wires extending also throughout the building or system so as to be each accessible to that of every other user's wire.

$w^7, w^7, w^7$  are wires running direct from one of the battery wires  $w$  to the pivoted standards  $n'$  of the keys H.

$w^4, w^4, w^4$  are wires running from the other battery wire  $w$  to the contact plates  $e, e, e$  on the base plates A, A, A.

$w^5, w^5, w^5$  are wires running, the one on the right at station No. 3, from contact 5 to wire  $w^2$ ; the one in the center at station No. 2 from contact plate  $g'$  to wire  $w^2$  and the one on the left at station No. 1 from contact 4 to wire  $w^2$ . The wires  $w^6, w^6, w^6$  and  $w^8, w^8, w^8$  respectively bear the same relation to wires  $w'$  and  $w^3$  and the contact plates  $g' g'$  as do the wires  $w^5$  to the contact plates  $e$  and wire  $w^2$  as just described and as will be perfectly apparent on inspection of the drawings.

Telephone transmitters and receivers and trembler call bells of well known form are located at each station in the circuits  $w^9, w^{10}$  connected respectively to the contact plates  $d, e'$  and  $g'$  as shown at stations No. 1, No. 2 and No. 3.

In Fig. 6 I have shown a novel form of switch for transferring the circuit from the call bells T B to the receivers T R and vice versa. In this switch the receiver T R is pivotally secured to its base or support Q by a hinge  $r$  and the conductor  $z$  is led to a contact spring  $S^2$  secured to the base Q; a corresponding contact plate  $S'$  being secured to the transmitter box T R the arrangement being such that when the instrument is tilted into the position shown in dotted lines the bell circuit will be broken between the spring  $S^2$  and contact plate  $S'$ . Inasmuch as the call bells T B are preferably secured on the backs of the receivers or hand phones T R, they and their circuit connections are not shown in Fig. 5 but the operation will be clear in

this particular on referring to Fig. 6 in connection with the description of the mode of operation of the system which I will now make, referring to Fig. 5 in particular. An inspection of this figure will reveal the fact that the system is properly speaking an open circuit system and battery is used only while operators or users are signaling or talking. Suppose first, that the superintendent whose instrument is at station No. 3 wishes to call the bookkeeper whose instrument is at station No. 1, it being understood that all of the users' instruments are duplicates, except that each user's title is left off his own instrument, the circuit connections being such that when any key is depressed opposite the name on the top of the instrument that person will be called and conversation may ensue between the caller and the called only. The operator at station No. 3 therefore swings his key H about its pivot until the outer of the yielding spring contacts  $s^2$  lies over the contact point No. 1 and in such position that when the key lever is depressed it will ultimately touch the bottom of the notch  $b$  and permit good firm electrical contact between the spring  $s^2$  and contact point 1. On depressing this key continuity of circuit is ruptured between the contact point  $d'$  on the top of the key and the curved metal plate  $d$  (see Fig. 4) and a complete electrical circuit is established from the + pole of the battery  $B^2$  as follows: by lower wire  $w$ , wire  $w^4$  at station No. 3, contact plate  $e$ , bridging contacts  $s'$  (see Fig. 2), contact plate  $e'$ , wire  $w^9$  to receiver, through the call bell to wire  $w^{10}$ , contact plate  $g'$  at station No. 3; bridging contacts  $s^2$  (see Fig. 3), contact point 1, wire  $w^6$ , wire  $w'$ , wire  $w^6$  at station No. 1, wire  $w^{10}$  to call bell, wire  $w^9$  to contact plate  $d$  and contact  $d'$  on the top of key H (see Fig. 4), through pivot standard  $n'$  and wire  $w^7$ , wire  $w$  to — pole of battery  $B^2$ . This rings the trembler bells at both stations continuously while key H is held down at station No. 3. The "bookkeeper" or person called on answering may either momentarily depress his key thereby breaking the bell circuit or by taking up his hand phone T R may rupture the bell circuit as does also the superintendent when he learns his call has been heard. Conversation therefore ensues so long as the superintendent holds his key depressed; or if he wishes to lock his key in position he may do so by carrying it slightly to the left under the ledge or projection B, in which position it will remain until manually released. In a similar manner the manager at station No. 2 by depressing his key when over contact 3 may call the superintendent or by placing it over contact 1 may call the bookkeeper. In like manner any operator may call any other at will or several may call at once, the battery  $B^2$  being then used in multiple arc relation.

With the described arrangement of apparatus I am enabled to do, with a single signaling key or switch at each station, that



which has heretofore required two and even a greater number of keys or switches. By using a single battery I am enabled to locate it in a position where it will give no annoyance to the users or operators and to place it always under the scrutiny of the person having charge of such matters without necessitating a daily visitation to different parts of the system or building where the apparatus is used. I do not limit myself to the particular or especial arrangement of the apparatus as a whole as herein described and shown. I believe it is also new with me to provide a single pivoted operating key or switch and circuit connections at each station with intermediate line wires whereby each user or operator may call any other user in the system by manipulating said key or switch as described and this without limiting myself to any special form of key such as that shown and described. Nor do I limit the application of the apparatus herein described to telephonic systems as it obviously may be used in any place where intercommunicating signals are to be transmitted as in hotels, fire alarm stations, factories and the like, and my claims comprehend all such analogous uses in the electrical art whether used with or without telephonic apparatus. I believe it is also new with me to so arrange the circuits and circuit connections, switches, call bells and telephonic instruments in a system of telephonic intercommunication that when a signal is transmitted and conversation had both operators will be automatically warned by the ringing of the call bells on restoring their hand phones to normal position that the signaling circuit should be placed in normal condition by releasing the signaling key or switch and my claims are also generic as to this feature.

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

1. A signaling system comprising an electrical generator, a series of pivoted keys or switches permanently connected all to one pole of said generator, a series of signaling receiving instruments, one for each key or switch, a series of normally open contacts for each of said keys and electrical connections between said normally open contacts the signal receiving instruments and the other pole of the generator, whereby an operator at any key or switch may actuate the signal receiving instrument of any other operator in the system, substantially as described.

2. A signaling system comprising an electrical generator, a series of pivoted keys or switches permanently connected all to one pole of said generator and temporarily connected on their back stops each to its own signal receiving instrument; a series of normally open contacts for each of said keys, each set of such contacts having electrical connections with the signal receiving instruments of all of the other operators or users

and additional circuit connections to the other pole of the generator, substantially as described.

3. A signaling system comprising an electrical generator having multiple arc connections from one of its poles with a series of pivoted switches or keys and through the back contacts thereof to signal receiving instruments, in combination with normally open front contacts at each key or switch and circuit connections therefrom to and through each outlying signal receiving apparatus and additional circuit connections permanently connected to the other pole of the battery, each of said keys being adapted to close the circuit from the generator to and through its own and any outlying signal receiving apparatus of the entire system, substantially as described.

4. A signal transmitting key or switch having circuit connections on one side to one pole of an electrical generator and through its back stop to signal receiving apparatus, and provided with a number of normally open front contacts operatively connected each with independent outlying signal receiving apparatus and with the other pole of an electrical generator, the movable part of said switch being adapted to make contact with any one of said open contacts and to operate simultaneously the signal receiving apparatus at the home and any one of the distant or outlying stations.

5. A signal transmitting key or switch provided with means for connecting it to one pole of an electrical generator and a number of normally open contacts adapted to be connected to independent signal receiving apparatus and the other pole of said generator, the movable part of said key being pivotally secured and provided with bridging contacts for effecting circuit connections through the normally open contacts and the signal receiving apparatus in any desired order, substantially as described.

6. A signal transmitting key or switch pivotally secured to a base provided with stationary contact plates and a series of fixed contacts normally connected to independent signal receiving instruments, in combination with pairs of bridging contacts carried by the pivoted key lever for closing the circuit to any one of the outlying signal receiving instruments through an electrical generator common to all of said receiving instruments.

7. A signal transmitting key or switch pivotally secured to a base which carries also a series of normally open contacts radially disposed, said key lever being provided with electrical contacts for closing the circuit through any one of said fixed contacts, in combination with hooks or catches for temporarily locking or securing the key lever in a depressed position over any one of said contacts, substantially as described.

8. A signal transmitting key or switch pivotally secured to a base provided with nor-



5 mally open radially disposed contacts and additional contacts carried by the key lever for closing the circuit through any one of said fixed contacts, in combination with hooks or catches for temporarily locking or securing the key lever in a depressed position over any one of said fixed contacts, substantially as described.

10 9. A telephone pivotally secured to a portable base or support, in combination with switching contacts between the base and the telephone, whereby when the latter is tilted to one side the circuit connections are changed, substantially as shown.

15 10. A telephone secured to a portable base by one or more hinges in combination with switching contacts secured respectively to the telephone and the base, and circuit connections whereby when the phone is tilted to one side the necessary circuit changes are made.

20 11. A hand telephone hinged to a portable base, circuit connections carried respectively by the base and the telephone and additional circuit connections running from the latter and a call bell, whereby the desired circuit changes may be effected through the telephone or the bell by tilting the telephone in either direction.

25 12. A system of telephonic intercommunication embracing a pivoted signaling key, signal calling mechanism and a telephonic transmitter and receiver at each user's station, in combination with a single battery having cir-

35 cuit connections and operatively connected to switching mechanism for utilizing said battery for the purpose of signaling or talking at the pleasure of the users; the circuit connections being such that the call bells will be rung continuously on restoring either telephone to its normal position unless the switch or key at the calling station be first restored to its normal position. 40

13. A system of telephonic intercommunication embracing signal transmitters, signal call mechanism and a telephonic transmitter and receiver at each station, with an electrical generator common to all the apparatus, and switching mechanism at each station consisting of a pivoted key lever provided with means for temporarily locking or securing in closed position, in combination with switches between the telephonic transmitters and the call bells and circuit connections whereby the signaling instruments are replaced by the telephonic instruments and vice versa and the signaling receivers caused to act continuously unless the switch at the calling station be restored to normal position after the telephones have been used. 45 50 55

In testimony whereof I have hereunto subscribed my name this 29th day of November, 1893. 60

THOMAS MCCOUBRAY.

Witnesses:

C. J. KINTNER,

M. M. ROBINSON.