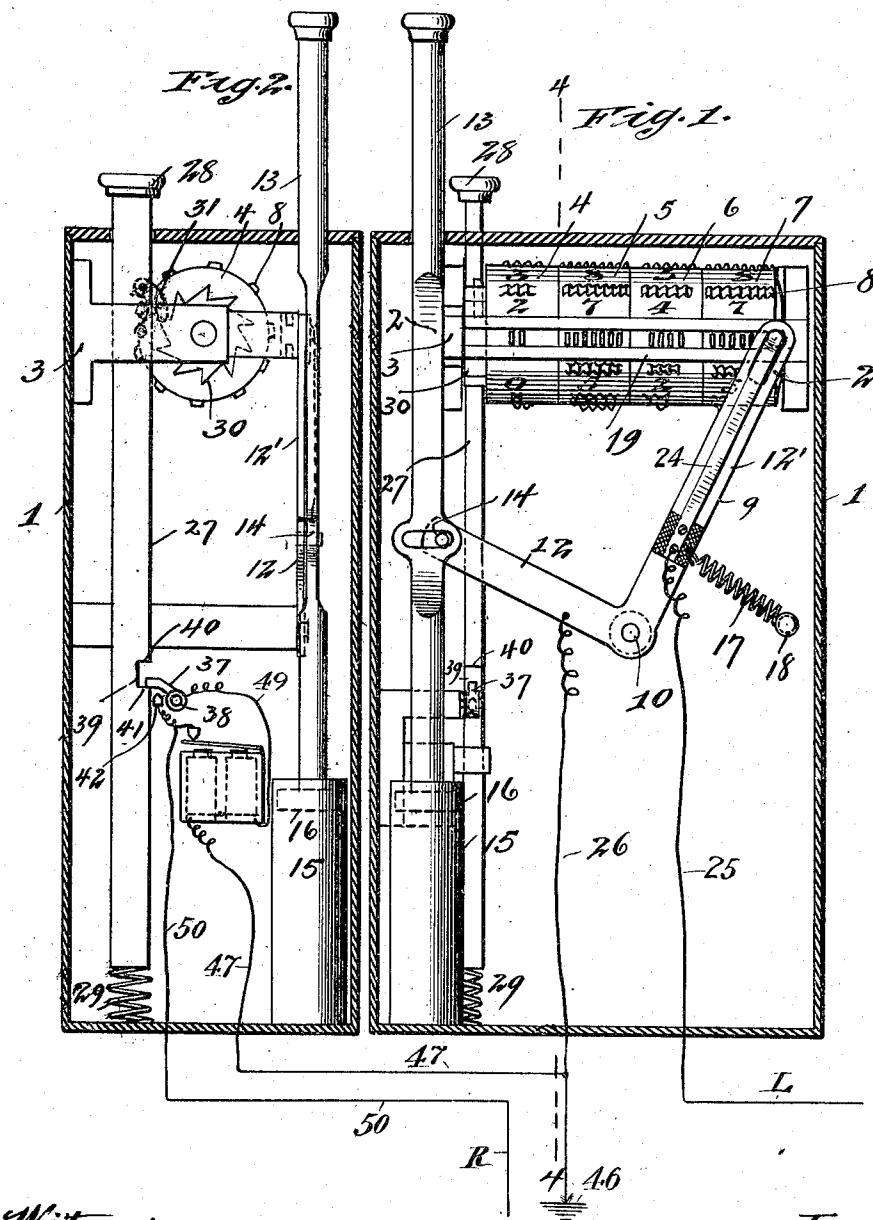
No. 873,270. PATENTED DEC. 10, 1907.

L. A. SCHMIDT.

REGISTER.

APPLICATION FILED FEB. 10, 1902

3 SHEETS—SHEET 1.



Witnesses,
D. D. Mann,
A. L. Grave

Inventor,
Louis A. Schmidt,
By Offield Towle & Linthicum
Atty's.

No. 873,270. PATENTED DEC. 10, 1907.

L. A. SCHMIDT.

REGISTER.

APPLICATION FILED FEB. 10, 1902.

3 SHEETS—SHEET 2.

Fig. 3.

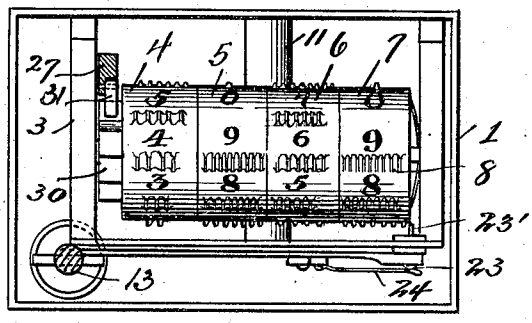


Fig 8.

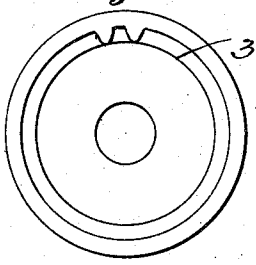


Fig. 4.

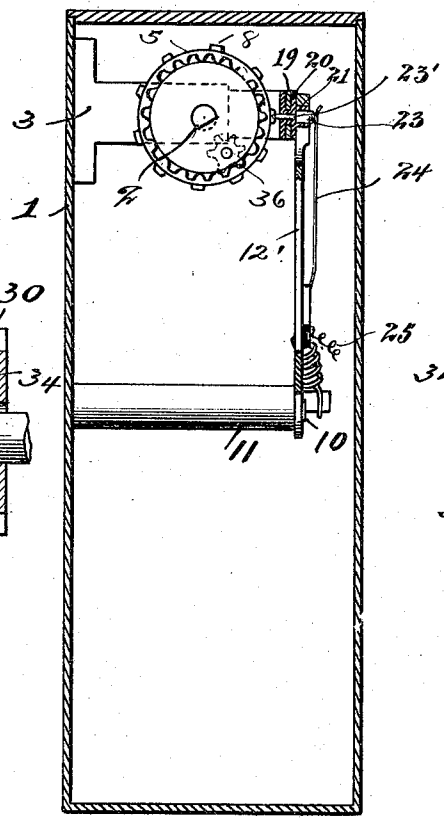


Fig. 5.

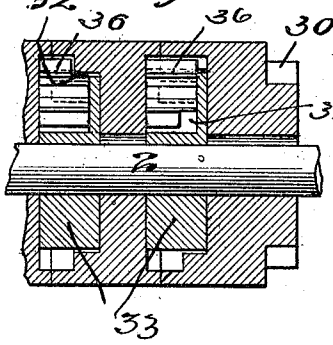


Fig. 6.

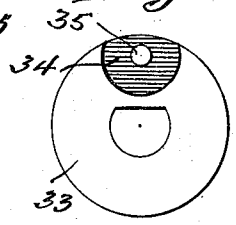
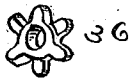


Fig. 7



Witnesses,
L. E. Mann
A. N. Graves

Inventor,
Louis A. Schmidt,
By Offield Towler & Linthicum
Attys.

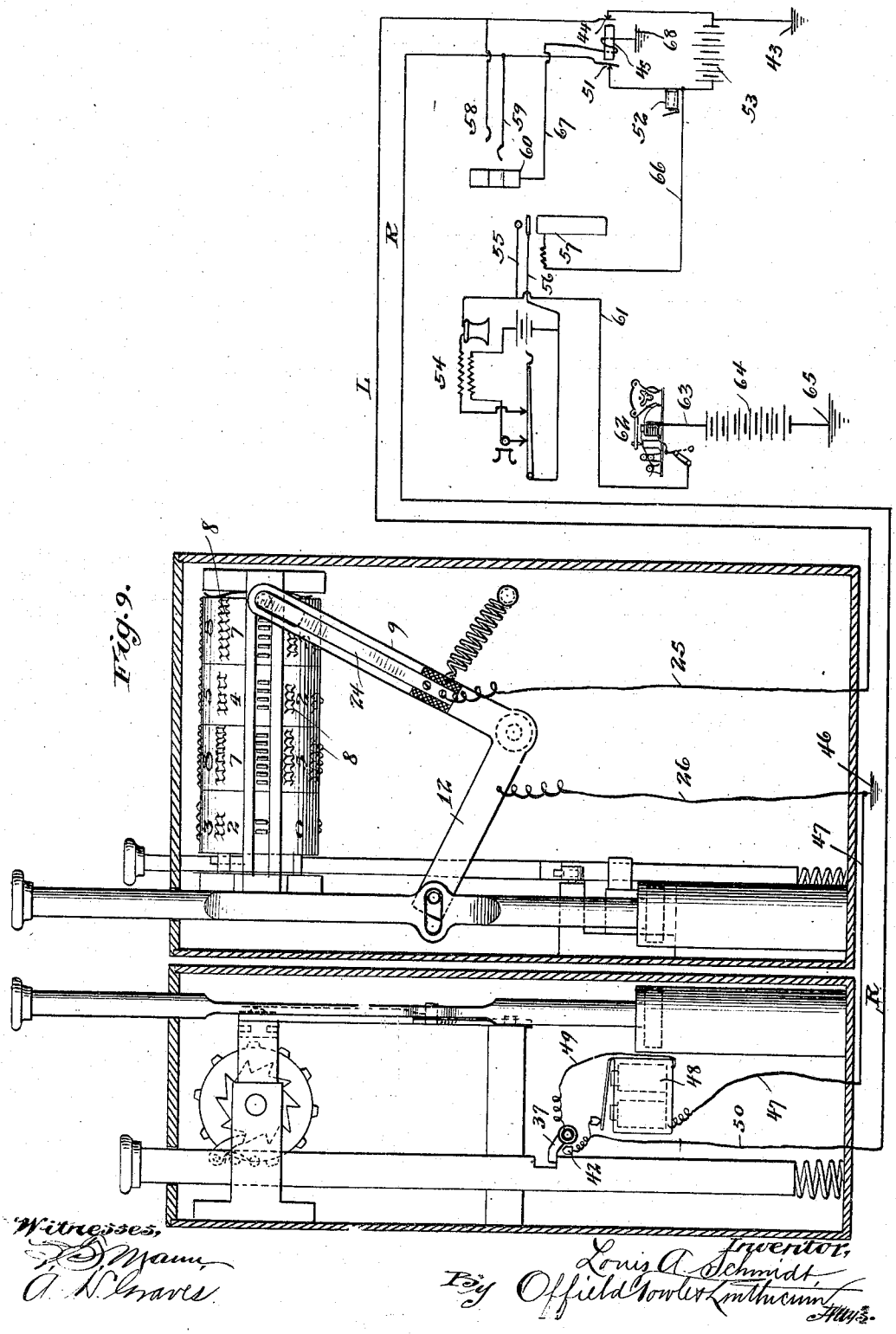
No. 873,270. PATENTED DEC. 10, 1907.

L. A. SCHMIDT.

REGISTER.

APPLICATION FILED FEB. 10, 1902.

3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

LOUIS A. SCHMIDT, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO JAMES E. PLEW, OF CHICAGO, ILLINOIS.

REGISTER.

No. 873,270. Specification of Letters Patent. Patented Dec. 10, 1907.

Application filed February 10, 1902. Serial No. 93,412.

To all whom it may concern:

Be it known that I, LOUIS A. SCHMIDT, a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Registers, of which the following is a specification.

This invention relates to improvements in registers and refers more specifically to an improved register or tallying machine from which readings may be taken electrically; the device being particularly adapted for use in connection with telephones, although not confined to this particular application.

Among the objects of the invention are to provide a simple and reliable tallying mechanism which may be conveniently operated and from which a reading of the accumulated calls or tallies may be taken at any time electrically; to provide a device of this general character by means of which a reading may be transferred to a distant point electrically and by the simple manipulation of a push button, or equivalent device; to provide a construction in which the operation of pressing a button to call for a telephone connection, operates to automatically register the call and also to throw into operation a "buzzer" which signals for the connection; to provide in a device of this general character means for insuring a gradual movement of the traversing device by means of which a tactual reading is accomplished, and in general to provide a simple and improved device of the character referred to.

To these ends the invention consists in the improvements hereinafter described and more particularly pointed out in the appended claims, and the invention will be more readily understood from the following description by reference to the accompanying drawings forming a part thereof, and in which—

Figure 1 is a front elevation of a preferred embodiment of my invention; the front casing of the register being removed to expose the arrangement of the mechanism therein. Fig. 2 is an end elevation of the same with the side casing removed, and looking at the left-hand side of the device as seen in Fig. 1. Fig. 3 is a plan view with the top casing removed. Fig. 4 is a transverse, vertical, sectional view taken on line 4—4 of Fig. 1. Fig. 5 is a detail view in axial section of a pair of the tally wheels showing particularly the carrying mechanism therein, and Fig. 6 is a face view of the inner disk-like support within which the transfer pinion is journaled. Figs. 7 and 8 are details of the registering disks. Fig. 9 is a view partly structural and partly diagrammatic, showing the circuit connections between the register and central station.

Referring to the drawings, 1 designates as a whole a suitable casing within which is conveniently mounted a shaft 2 having its ends supported in suitable brackets 3 and held from rotation thereby. Upon the shaft 2 are journaled a plurality of registering disks, as 4, 5, 6 and 7, each of which is provided upon its outer surface or periphery with a series of longitudinally extending rows of contact points or projections 8; these groups of contact points being in the embodiment shown herein grouped to represent the digits from 0 to 9 and spaced at uniform distances apart around the circumference of the several disks to represent the series of digits. The contact points 8 are of metal or suitable conducting material and are adapted to make and break contact with a wiper or traversing contact device for the purpose of transmitting electrical impulses to a distant station. To this end the several tally disks or wheels are so journaled upon the shaft 2 as to be stepped forward and to be arrested in their several positions with their groups or lines of contact points in alinement with each other as indicated clearly in Fig. 1.

9 designates as a whole a traversing contact device which, in the present instance, takes the form of an angular lever pivotally supported at its angle as indicated at 10 to a suitable support 11 within the casing and having one of its arms 12 operatively connected with an actuating rod which is arranged to reciprocate vertically within the casing and extends out through the top of the same to form a push button 13.

In order to provide for the movement of the attached end of the arm 12 relative to the actuating rod, a slot and pin connection is provided as indicated at 14 and in order to insure a gradual movement of the traversing device across the faces of the series of disks, the lower end of the actuating rod is arranged to extend within a dash-pot 15 and is provided with a piston 16 operating therein in the usual manner. The actuating rod is normally held at its upper limit of movement

by means of a retracting spring 17 conveniently connected with the traversing arm 12′ and with a suitable stud 18 within the casing.

Extending longitudinally across the faces of the several disks is a pair of parallel guides 19 which may be and are shown herein as supported upon the brackets 3 hereinbefore referred to so as to extend adjacent the peripheries of the several disks.

20 designates a sliding block or traverser mounted to slide upon the guides 19 and either formed of insulating material or properly insulated from the parts which it supports as hereinafter described. The slide or traverser 20 is operatively connected with the arm 12′ so as to move with the latter across the faces of the disks, and to this end said slide is conveniently provided upon its outer side with a wrist-like extension or stud 21 which engages and fits within a slot 22 formed to extend longitudinally in the end of the arm 12′; the slot and wrist connection affording the necessary relative movement between the slide and arm as the latter sweeps through its arc of movement.

23 designates a spring-pressed plunger contact device which is mounted within and to extend through the slide 20 and project inwardly beyond the latter sufficiently to make contact with the several contact points 8 as the slide moves across the faces of the disks. The outer end of the plunger 23 is shouldered so as to limit the extent of inward movement thereof and a plate spring 24 is arranged to bear yieldingly against its outer end as shown clearly in Fig. 4. The contact device 23 is of metal or other conducting material and its shoulder 23′ is so located as to limit its inward movement and insure a breaking of contact between the point of the same and the projections or contact points 8 as it passes from one to the other of the series. The spring 24 is electrically connected with one circuit wire 25 of an electrical circuit and the body of the register and therefore the several tally disks or wheels thereof, with the other circuit wire 26 of the circuit, so that the circuit is alternately made and broken as the traverser sweeps across the face of the disks and the plunger 23 engages those points which are in alinement with the path of the traverser.

In order to step the tallying wheels forward to register the number of calls, a second actuating rod 27 is provided which is mounted to reciprocate in suitable bearings in the casing and is arranged to extend upwardly through the top of the latter and terminates in a push button 28. The actuating rod 27 is normally held at its upper limit of movement by means of a spring 29 and is arranged to extend adjacent to the end of the units tally disk 4, which latter is provided with a ratchet wheel 30 having a series of teeth corresponding in number to the series of digits. Upon the actuating rod 27 is mounted a push pawl 31 which serves to step forward the ratchet wheel one step upon each depression of the actuating rod.

Any suitable carrying mechanism may be employed for transferring a proper movement from the tally disks of lower order to those of next higher order, in a well understood manner, but in the present instance I have chosen a mechanism which is best shown in Figs. 4, 5 and 6. As shown in said figures, each of the tally disks, except that of highest order, is provided with an internal gear rim or flange 32 having two teeth and arranged to overhang or telescope upon the periphery of a disk-like pinion support 33 which is immovably mounted upon the main shaft 2. The pinion support is provided in one face at its periphery with a recess 34 carrying a stud 35 upon which is journaled a pinion 36 which, as best seen in Fig. 7, is essentially a double pinion, one member of which has six teeth, while the opposite side has but three. The disk of next higher order is provided in its meeting face with an internal gear having double the number of teeth there are unit spaces or digits upon the periphery of the disk and the pinion 34 is so disposed that its side having the larger number of teeth intermesh with the disk of higher order, while its opposite side intermeshes with the disk of lower order and having but two teeth. In the embodiment shown herein the pinion 35 has but three teeth on one side and six on the opposite, and the triangular disposition of the three teeth causes the pinion to coöperate with the untoothed portion of the flange of the disk of lower order to lock the latter against movement except during the time its two teeth are engaged with the pinion. In other words, upon each rotation of the disk of lower order, the pinion will be rotated one-third of a revolution and will consequently rotate the disk of next higher order two teeth or one-tenth of a revolution; the pinion being locked against further rotation until the disk of lower order again completes its revolution.

In order that a signal may be automatically given to central at the same time that the push button 28 is depressed to record a call, the actuating rod 27 is made to close a circuit through an ordinary "buzzer," thereby causing an electrical vibration on the line which notifies central of the call. To this end a contact lever 37 is pivotally mounted upon a suitable support 38 within the casing and is arranged to project at its free end within a recess 39, having upper and lower shoulders 40 and 41 adapted to engage the upper and lower sides of the contact lever respectively as the actuating rod 27 is moved from one limit of movement to the other. 42 designates a fixed contact point which is so located as to be within the path of the

swinging end of the contact lever 37 when the latter is depressed; the lever being held out of engagement with the contact device 42 when the contact rod is in its normal or uppermost position as shown clearly in Fig. 2. The contact lever 37 forms one terminal and the contact device 42 another, of a circuit through the "buzzer," so that whenever the push button 28 is depressed the circuit will be closed and a signal thus given to central.

The operation of the device has been clearly indicated in connection with the description of the mechanism, but it may be briefly recapitulated as follows: Each time the push button 28 is depressed to signal "central" for a connection, the tally mechanism is stepped forward to record the call through the engagement of the pawl 31 with the ratchet of the units disk. At any time when it is desired to take a reading of the register, central will call up the subscriber and instruct him to depress the push button 13; it being understood that the telephone circuit which extends through the register at the subscriber's station, also extends through a recording instrument which may be of the ordinary Morse type, at the station at central. The depression of the push button 13 causes the traversing contact device to move gradually across the series of disks and to accordingly make and break the circuit a number of times equal to the number of contact points at that time in alinement with the path of the traversing contact device. The return movement will simply repeat the recording operation.

In Fig. 9 is shown a suitable system of circuit connections for the register. As shown in said figure, the conductor 25 forms a part of the main line wire L, which extends to the central office and normally to ground at 43; a switch contact 44 being provided in this line, controlled by a relay 45 which opens the circuit at 44 when the operator "plugs in." The conductor 26 leads to ground at 46, and a branch conductor 47 connected therewith leads to and through the buzzer 48, thence through a conductor 49 to and through the contacts 37 and 42 hereinbefore described, and back to the right main line R over a conductor 50. At central the right-hand line is provided with a contact 51 operated by the relay 45, passes thence to the drop 52, to and through battery 53, and thence to ground at 43. 54 designates as a whole a usual telephone set forming a part of the cord circuit, and 55, 56 and 57 respectively designate the three terminals of a plug adapted to respectively coöperate with the two spring contacts 58, 59 and sleeve 60 of the switch board. From the tip contact 55 a conductor 61 extends to and through any suitable recording instrument 62; an ordinary Morse ticker being indicated in conventional form. From the ticker a conductor 63 leads to battery 64, and thence to ground at 65.

The recording circuit may be traced as follows: Assuming that the central operator's plug is inserted, current will flow from ground 43 through battery 53, and a conductor 66 to the contact member 57 of the plug, thence through the contact member 60 of the sleeve to a conductor 67, leading to and through the relay 45 and to ground at 68, thus holding open the contacts 44 and 51. The recording circuit will then be from ground at 65 through the battery 64, ticker 62 and conductor 61 to the plug contact 55; thence to contact 58 and over the left main line to the spring 24 of the angular contact lever 9. The spring 24 and connected parts form an interrupted circuit through the contact points 8 of the register disks, which latter are in electrical connection with the arm 12 of the angular contact member, as hereinbefore fully described, and from the latter arm the circuit is over conductor 26 to ground at 46, thus completing the circuit from ground at 65 to ground at 46. It follows that this circuit will be opened and closed as the contact lever sweeps across the series of disks a number of times equal to the number of contact points 8 at that time in register with the guide ways 19, and accordingly the ticker will indicate a corresponding series of impressions on the tape.

It will be seen from the foregoing that a reading may be taken at any time without in any wise interfering with or affecting the operation of the register and that the mechanism is so simple and positive in operation that there is little chance or possibility of errors in operation.

While I have herein shown and described what I deem the most preferred embodiment of my invention, yet the details of construction may be modified without in any sense departing from the spirit of the invention, and I do not, therefore, limit myself to these details except to such extent as they are made the subject of specific claims.

I claim as my invention:

1. In an electrical register, the combination of a series of tally wheels, a ratchet and push-button mechanism for stepping said talley wheels forward to record the number of calls, a circumferential series of groups of contact points upon each tally wheel each group corresponding in number of points to one of the digits, a traversing slide guided to reciprocate across said series of tally wheels, a spring-pressed vibrating contact device operatively mounted in said slide, an electric circuit, circuit interrupting means actuated by said vibrating contact device and included in said circuit which is alternately opened and closed by the vibrations of said contact device, a manually operable actuating device for moving said slide across

the series of tally wheels, operable independently of said ratchet push-button, and an electric signal operatively connected with said ratchet push-button mechanism.

2. In an electrical register, the combination of a series of tally wheels, a ratchet and push-button mechanism for stepping said tally wheels forward to record the number of calls, a circumferential series of groups of contact points upon each tally wheel each group corresponding in number of points to one of the digits, a traversing slide guided to reciprocate across said series of tally wheels, a spring-pressed vibrating contact device operatively mounted in said slide, an electric circuit, circuit interrupting means actuated by said vibrating contact device and included in said circuit which is alternately opened and closed by the vibrations of said contact device, a manually operable actuating device for moving said slide across the series of tally wheels, operable independently of said ratchet push-button, a retarding mechanism governing the moving of said slide actuating device, and an electric signal operatively connected with said ratchet push-button mechanism.

3. In an electrical register, the combination of a series of tally wheels, a ratchet and push-button mechanism for stepping said tally wheels forward to record the number of calls, a circumferential series of groups of contact points upon each tally wheel each group corresponding in number of points to one of the digits, a traversing slide guided to reciprocate across said series of tally wheels, a spring-pressed vibrating contact device operatively mounted in said slide, an electric circuit, circuit interrupting means actuated by said vibrating contact device and included in said circuit which is alternately opened and closed by the vibrations of said contact device, a manually operable actuating device for moving said slide across the series of tally wheels, operable independently of said ratchet push-button, a retarding mechanism governing the moving of said slide actuating device, means operating to automatically return said slide actuating device to its normal position, and an electric signal operatively connected with said ratchet push-button mechanism.

LOUIS A. SCHMIDT.

Witnesses:
FREDERICK C. GOODWIN,
ALBERT H. GRAVES.