

A. F. DIXON.
FOUR-PARTY KEY.
APPLICATION FILED JUNE 11, 1910.

1,105,629.

Patented Aug. 4, 1914.

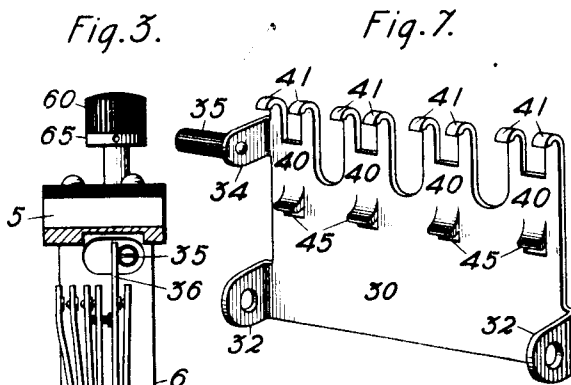
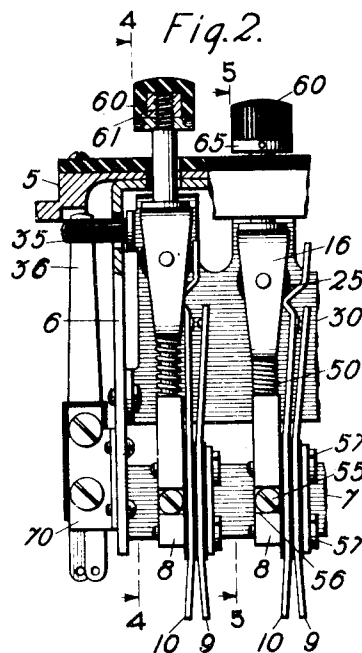
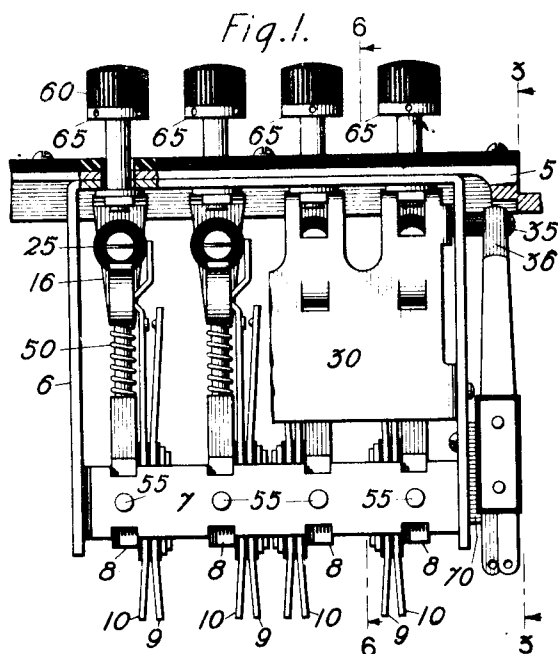


Fig. 7.

Fig. 5.

Fig. 6.

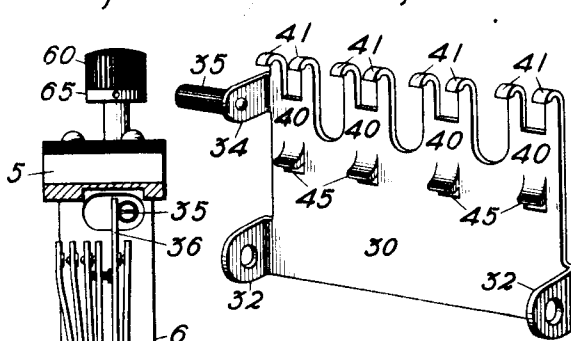
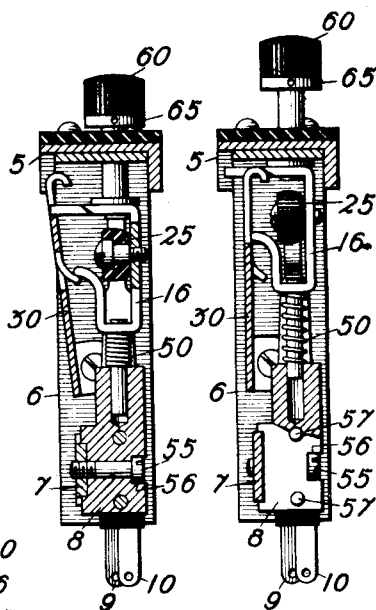


Fig. 4.



Witnesses:
G. M. Campbell
J. P. McIntosh.

Inventor:
Amos F. Dixon.
by L. C. Munner, Atty.

UNITED STATES PATENT OFFICE.

AMOS F. DIXON, OF NEWARK, NEW JERSEY, ASSIGNOR TO WESTERN ELECTRIC COMPANY, OF NEW YORK, N. Y., A CORPORATION OF ILLINOIS.

FOUR-PARTY KEY.

1,105,629.

Specification of Letters Patent.

Patented Aug. 4, 1914.

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To all whom it may concern:

Be it known that I, AMOS F. DIXON, citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Four-Party Keys, of which the following is in full, clear, concise, and exact description.

My invention relates to an operating key for selective party line ringing and more particularly to that class of keys wherein the last key depressed remains in a partly depressed position by reason of its engagement with a mechanical latching device to indicate to the operator upon which line the last call was made.

My invention has for its object to generally improve the form and construction of such a key to insure the most efficient operation and provide a structure of few and simple parts, easily assembled and easily accessible for cleaning or replacement.

In carrying out my invention I provide a novel form of plunger by means of which I am able to accomplish the principal object of my invention—namely the provision, without expensive machining operations, of a convenient mounting space for a spring operating roller, whereby the width of the key structure is materially decreased, and a convenient and efficient means for preventing the key plungers from turning in their guides without the use of extra parts such as have heretofore been used. A key plunger which has been found convenient for the above purposes comprises generally two slide pieces connected by means of a yoke, said yoke comprising an upper and a lower horizontal plate and a vertical connecting side plate or web joining said upper and lower horizontal plates. The upper and lower slide members are attached to said horizontal plates and said horizontal plates are adapted to cooperate with a hinged latch plate in the manner hereinafter described. The spring operating roller is pivotally mounted upon the inner face of said vertical connecting web in such a manner that it projects beyond the plunger only in a longitudinal direction of the key.

Details of my invention are the method of mounting the keys upon a unit frame with the keys individually removable therefrom, the mounting of the springs and the manner of securing the key caps to the plunger rods.

In the drawings illustrating my invention Figure 1 is a view in side elevation with parts broken away of a key embodying my improvements; Fig. 2 is a detail view partially in section of two of the keys, one in ringing and the other in indicating position; Fig. 3 is a detail sectional view taken upon line 3—3 of Fig. 1; Fig. 4 is a detail sectional view taken upon line 4—4 of Fig. 2 and illustrates the parts with the key in its indicating position; Fig. 5 is a detail sectional view taken upon line 5—5 of Fig. 2, and illustrates the parts with the key in the ringing position; Fig. 6 is a detail sectional view taken upon line 6—6 of Fig. 1 and illustrates a key with the parts in normal position; Fig. 7 is a perspective of the latch plate; and Fig. 8 is a perspective of the key plunger stamping forming part of my invention.

Like reference numerals are used to designate like parts through the drawings.

In the drawings, 5 designates a metal top plate which is shown as faced with hard rubber. Secured to the top plate 5 is an inverted U-shaped frame 6 upon which are mounted the operating parts of the key. The lower ends of the inverted U-shaped frame are connected by a frame member 7 upon which are mounted a plurality of supporting blocks 8, to each of which are secured spring contact members 9 and 10, each of said blocks also being adapted to receive the lower end of a key plunger as will hereinafter appear. There are illustrated in the drawings four key plungers, this being the number in the party line key ordinarily used. These plungers are all alike and a description of one will suffice for a clear understanding of the key. As shown each of said plungers comprises three principal parts, an upper rod 15 extending downwardly through the top plate 5 and a registering opening in the top member of the frame 6, a lower rod 17 entering a guide hole in the block 8 and an intermediate connecting member or yoke joining said upper and lower rods. The connecting member or yoke is preferably made of a metal stamping and as shown in Fig. 8 is provided with an upper and a lower horizontal plate 20 and 21 and a vertical connecting member or web 16 joining said upper and lower horizontal plates. The rods 15 and 17 are connected with said upper and lower horizontal plates.

The upper horizontal plate 20 is provided with a reduced portion 22 and transversely arranged shoulders 23, 23 adjacent thereto which are beveled on their under sides, said reduced portion being adapted to engage an opening in a latch plate 30 to prevent the turning of the key plunger. The lower horizontal plate 21 is provided with a projection 27 formed by turning upwardly and outwardly a portion of said lower horizontal plate. An antifriction roller 25 pivotally mounted upon the inner face of the web 16 of said yoke in the central longitudinal axis thereof is adapted to engage the spring 10 to press it into engagement with the spring 9.

Referring now to the latch plate 30, same is shown in full in Fig. 7 and is preferably stamped from a single piece of metal. Said plate is adapted to be secured to the legs of the U-shaped frame 6 and for this purpose is provided on its opposite ends adjacent to its lower margin with projecting members 32, 32 adapted to lie flat against the faces of the legs of said U-shaped frame and to be pivotally secured thereto. Along its upper margin said latch plate 30 is provided with a plurality of U-shaped latch members 40, 40, the legs of which are bent over forming hook members 41, 41 which engage the upper horizontal plate 20 upon the yoke 16 when the key is pressed into its indicating position. Vertically below the slots in the U-shaped latch members the latch plate is provided with inwardly projecting members 45, 45 which in the operation of the key are adapted to be engaged by the projection 27 on the connecting yoke to force said latch plate outwardly. The reduced portion 22 of the upper plate 20 on the yoke 16 passes between the legs of the U-shaped members 40, 40, thus serving to prevent said plunger from turning in its operation to disengage the periphery of the roller 25 from its coacting spring. Near its upper margin and on one end thereof said plate is provided with an integral arm 34 extending at right angles to the face of the plate to which is attached a laterally projecting roller member 35 adapted when said plate is in place to project through a slotted opening in the adjacent leg of the U-shaped frame and engage a spring 36 which spring controls a plurality of contacts and also acts in the operation of the key plungers to press the latch plate into engagement with the coacting parts of the plunger member 16.

In the operation of any one of the keys the movement of the parts will be as follows: Assuming that the key starts from its normal position then the first movement thereof will bring the beveled faces of the shoulders 23, 23 on the upper plate of the connecting yoke into engagement with the top portion of the hook members 41, 41 on the latch

plate forcing said plate outwardly against the action of the spring 36 and permitting said shoulders and hook members to pass one another in the downward movement of the key. In its continued downward movement to bring the roller 25 into engagement with the spring 10 the lower projection 27 on the connecting yoke will engage its co-operating projection 45 on the latch plate 30 and will press said latch plate outwardly a greater distance than it was forced by the passing of the shoulders 23, 23 and the hook members 41, 41 and said latch plate in this movement will move the spring 36 to close spring contacts controlled thereby. A coiled actuating spring 50 surrounding the lower rod 17 of the plunger and bearing at its opposite ends against the upper end of the block 8 and the lower end of the connecting yoke will operate to move said plunger upwardly when the pressure of the finger is removed therefrom. As said key is moved upwardly and the lower projection 21 on the connecting yoke moves away from the projection 45 on the latch plate, said latch plate will be swung inwardly by the action of the spring 36 until the lower faces of the hook members 41, 41 engage the top face of the upper plate 21 of said yoke and lock said key plunger in its indicating position. Ordinarily the key last operated will be released from its indicating position as soon as the succeeding key moves past the indicating position in its downward movement, but in case the latching portions of one of the keys becomes worn to such an extent that it will not release the key last in the indicating position in the first part of its movement it will operate the latch plate to release it when the lower projection 21 on the connecting yoke is brought into engagement with the coacting projection 45 on the latch plate 30.

As hereinbefore stated the plunger rod 17 engages and slides in a hole in the guide block 8, this guide block also supporting the springs 9 and 10. As shown said block 8 is attached to the connecting bar 7 and for this purpose both the block and the bar are notched, the bar being notched on its opposite margins to receive the portions of the block adjacent to a notch provided thereon to fit over the notched portion of said bar. Each block is secured to the bar by means of a single machine screw 55, said block being provided with a notch 56 to permit the head of the screw to be sunk flush with or below the face of said block. The springs 9 and 10 are secured to one side face of the block 8 by means of machine screws 57, 57, the entire arrangement being such that any one of the plungers and blocks can be removed for replacement of any of the parts without disturbing the other plungers.

Key caps 60, 60 of hard rubber or other

suitable material are provided with threaded metal bushings 61, 61 adapted to engage a screw threaded portion 63 at the upper end of the plunger rod 15. A lock nut 65 is adapted to engage the lower face of each of said key caps to prevent them working loose in the operation of the keys.

A block 70 carrying the spring 36 and its associated spring contacts is secured to the outer face of one of the legs of the U-shaped frame by means of machine screws.

An indicating key embodying the features hereinbefore set forth is not only convenient to assemble but is very compact and the simplicity of the parts enables the manufacturer to produce such a key at low cost. Moreover the arrangement of parts herein shown and described enables the user to replace any which may become broken or otherwise damaged without disassembling the entire key. All of the contacts are easily accessible making the key easy to clean.

I claim:—

1. In an operating key the combination with a frame work, of contact springs mounted upon said frame work, a key plunger and a spring operating roller carried by said plunger, said plunger embracing an upper and lower rod and a connecting yoke having an upper and lower horizontal plate, and a vertical connecting web for said plates to the inner face of which said spring operating roller is pivotally secured.

2. In an operating key the combination with a frame work, of a swinging latch plate carried thereby, said latch plate being provided on its upper margin with notches and between its upper and lower margins with

projecting members, and a plurality of reciprocating key plungers adapted to cooperate with said latch plate, each of said plungers embracing an upper and lower rod and a connecting yoke therefor having an upper and lower horizontal plate, said upper plate having a projecting portion extending through a notch in the upper margin of said latch plate and said lower plate having a portion thereon adapted in the movement of the key plunger to engage a projection on said latch plate to swing said latch plate outwardly.

3. In a key, the combination with a framework, a swinging latch plate carried thereby, said latch plate being provided with a notch, locking projections formed integrally with said plate, and a plunger having an integral portion cooperating both with said projections and said notch whereby said plunger may be held in a depressed position and against turning.

4. In a key, the combination with a framework, a swinging latch plate carried thereby, said latch plate being provided with a notch, overturned projections on said plate formed of the material adjacent said notch, and a plunger having integrally formed extensions cooperating with said overturned portions and said notch whereby said plunger is locked in a depressed position and prevented from turning.

In witness whereof, I, hereunto subscribe my name this 9th day of June A. D., 1910.

AMOS F. DIXON.

Witnesses:

MORGAN WASHBURN, Jr.,
IRVING MACDONALD.