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H. E. MARSH ET AL.

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AUTOMATIC SIGNALING APPARATUS

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2 Sheets-Sheet 1

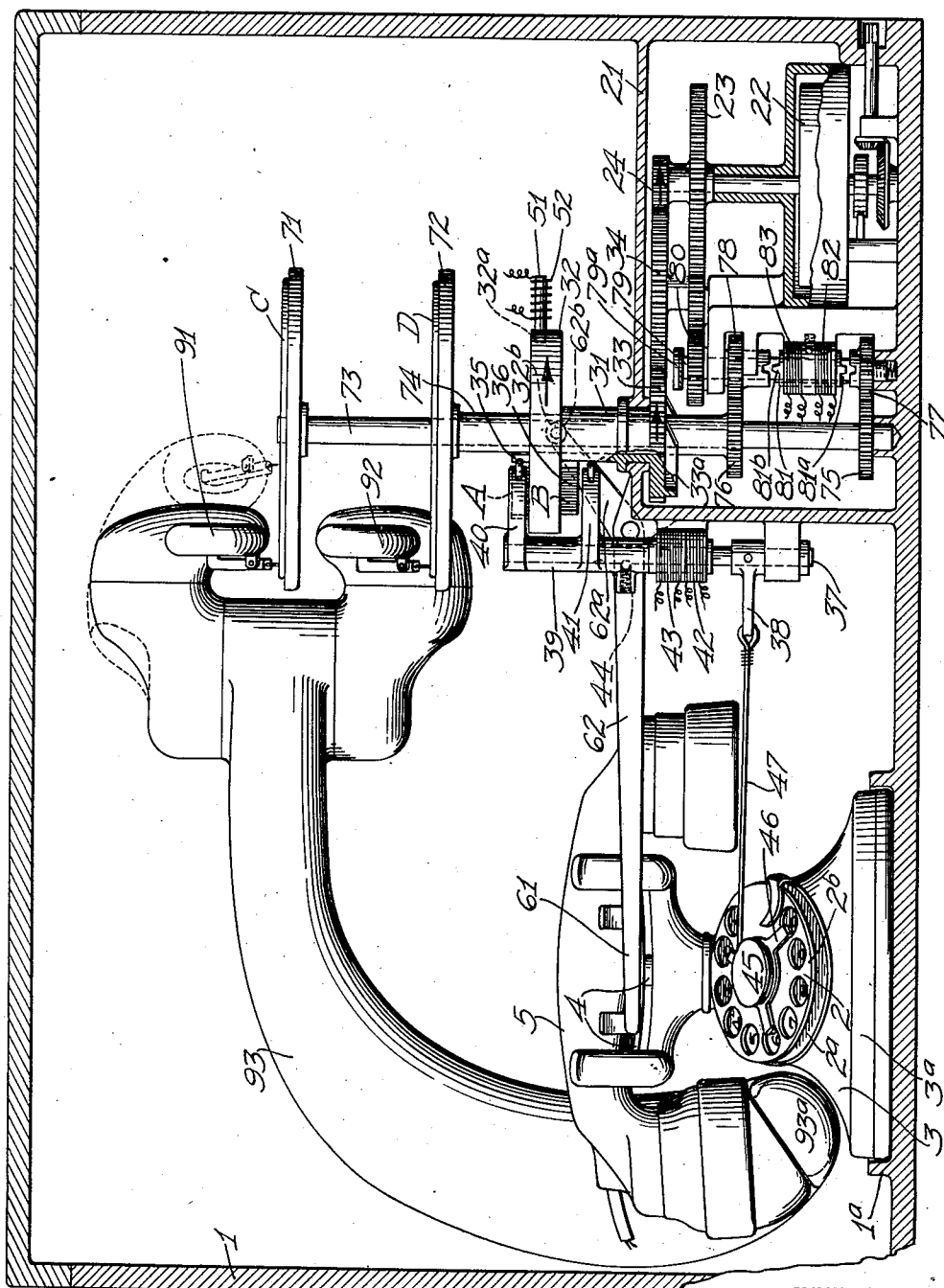


Fig. 1.

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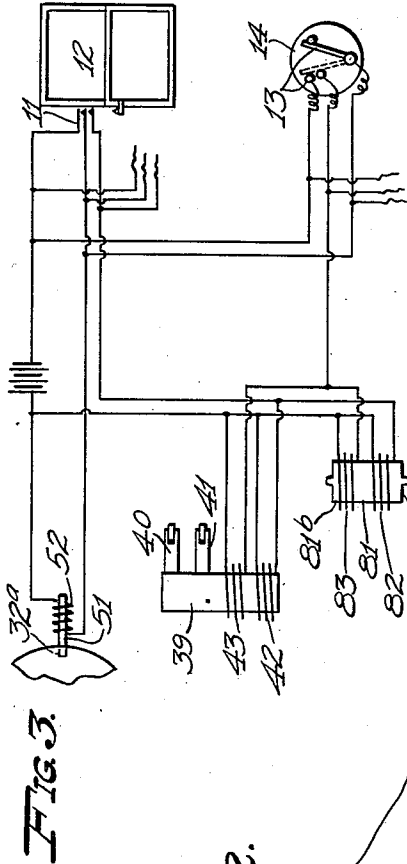
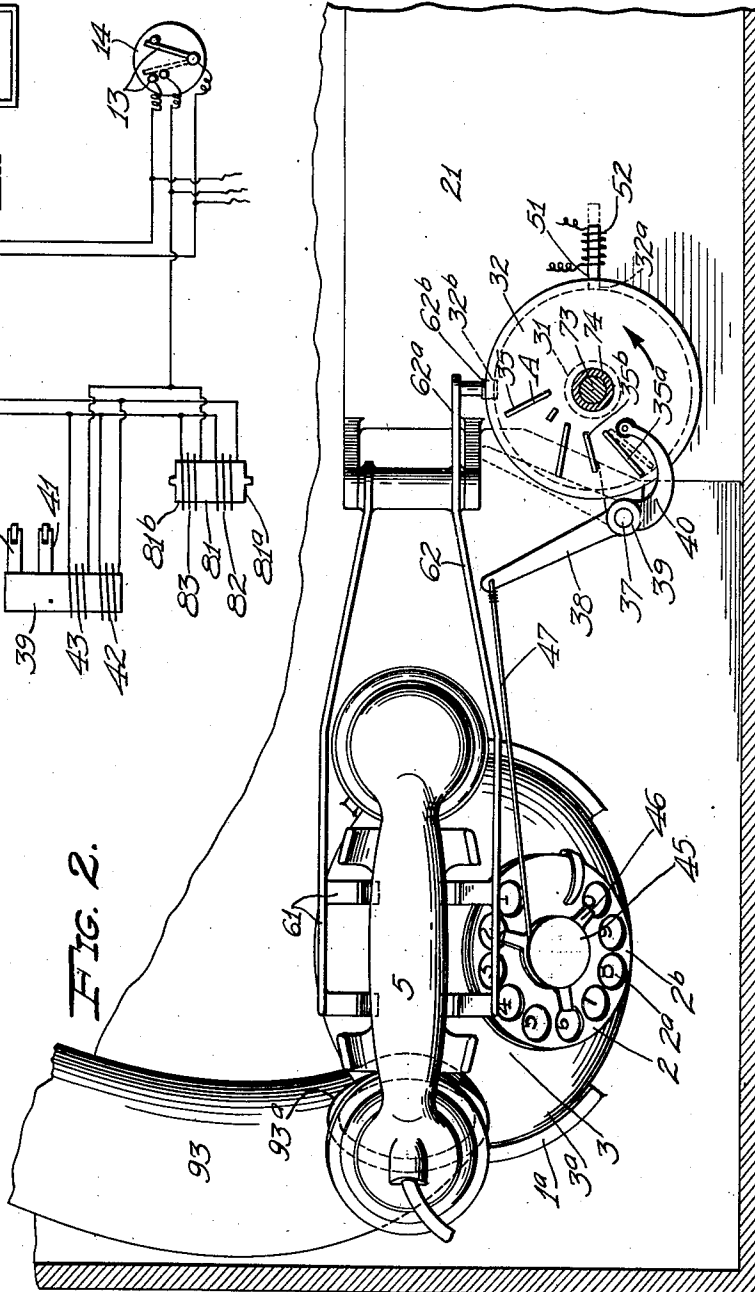
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2 Sheets-Sheet 2



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AUTOMATIC SIGNALING APPARATUS

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Application August 6, 1938, Serial No. 223,491

20 Claims. (Cl. 179—5)

Our invention relates to an automatic signaling apparatus, and more particularly to a burglar and fire alarm, or similar apparatus.

The principal object of this invention is to provide a signaling apparatus of this class which is particularly simple and economical of construction, simple and economical to operate, and which will not readily get out of order.

Another important object of this invention is to provide an apparatus of this class which may be simply and economically attached to a conventional or other telephone, or into which a conventional telephone may be readily placed and thereby the apparatus connected to the telephone.

An important object of this invention also is the provision of a novel means of operating the telephone dial to call a predetermined number, or to call any one of several numbers.

A novel feature also of this invention is the provision of a compact and coordinated structure for calling different numbers and sending different messages over the telephone to the called numbers.

With these and other objects in view as will appear hereinafter, we have devised an automatic signaling apparatus for giving burglar and fire alarms having certain novel features of construction, combination, and arrangement of parts and portions, as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon, which form a part of this application, in which:

Fig. 1 is a fragmentary side elevation of our automatic signaling apparatus, arranged particularly for giving burglar and fire alarms, certain portions of the apparatus and enclosure being broken away and in section to facilitate the illustration;

Fig. 2 is a fragmentary plan view thereof; and, Fig. 3 is a wiring diagram therefor.

Our signaling apparatus may be used in connection with the conventional telephone, or in connection with an additional special telephone instrument connected in the system. We shall describe our invention as applied to the former.

If used in connection with an additional special instrument no particular connection or adjustment need be made, but if used with the conventional telephone, the latter must be placed in a particular enclosure. This enclosure, whether used with either telephone, is designated 1.

The apparatus disclosed is designed particu-

larly to serve as a burglar alarm and a fire alarm. In the drawings, the burglar alarm is actuated by the closing of a circuit, such as by closing one or more switches 11 when a window or windows 12, or other openings are opened. The fire alarm is actuated also by the closing of another circuit by a switch or switches 13 connected to and actuated directly by thermostats 14 located in various parts of a residence or building.

In the enclosure 1 is a motor mechanism, operated by a motor 21, which is preferably a spring actuated motor and is adapted, when released, to perform preferably three functions, namely, (1) to lift the telephone receiver, (2) to call a certain telephone number, and (3) to deliver a prescribed message.

The motor is shown as having a main actuating spring 22 and drive gears 23 and 24, the surface speed of the latter being considerably less than the former. The gear 23 is adapted to operate the phonograph records while the gear 24 is adapted to operate the telephone-number-calling cams, to be described hereafter.

A tubular shaft 31 rises vertically from the motor mechanism 21 and supports a cam disc 32 at its upper end. The lower end has a gear 33 which is connected by an intermediate gear 34 to the gear 24. In the structure shown the disc 32 is provided at its upper and lower sides with separate series A and B of cam surfaces 35 and 36. The cam surfaces of each series consist of slightly spiral ridges, extending respectively above and below the disc. These ridges are of varying length, the length corresponding to the number on the dial 2 of the telephone instrument 3, the inner ends terminating preferably at equal distances from the axis of the disc.

At one side of the disc is a vertically positioned oscillating spindle 37, which has at its lower portion a fixed arm 38. At the upper end portion of the spindle 37 is slidably mounted a shoe 39 which has at its upper and lower ends arms 40 and 41 which are adapted to engage respectively the cam surfaces 35 and 36. This shoe is keyed to the spindle and is, therefore, held in fixed angular position with respect to the arm 38. This shoe is shifted to its lower and upper positions, in which the arms 40 and 41 engage respectively the cam surfaces 35 and 36 by electromagnets 42 and 43. These electromagnets are located in circuits, closed by the switches 11 and 13, respectively. The shoe is held in its lower and upper shifted positions by a suitable catch 44.

As the cam carrying disc 32 is rotated in the direction of the arrow, the first cam surface 35

engages the roller at the free end of the rider 40, rotating the spindle 37 and rotating the telephone dial member 2^b the desired amount, as the disc 32 continues to rotate, the amount of rotation of the dial depending upon the length of the cam surface. As the rider is moved to the outer end of the cam surface 35, it drops therefrom and engages the following cam surface 35^b, the rider being forced against the following cam surface by the spring (not shown) controlling the telephone dial. This operation is repeated until all of the cam surfaces engage and rotate the rider 30. The amount of rotation of the telephone dial is always dependent upon the length of the particular cam surface.

The dial of the conventional telephone consists of a stationary portion 2^a, on which the numbers of the telephone are inscribed, and a rotatable member 2^b having finger holes through which the numbers may be seen, and whereby the member 2^b may be rotated. We have provided means of rotating the member 2^b, which consists of a sheave 45 which is arranged coaxial with the member 2^b, and is detachably held in such position by three fingers 46, in the form of spring clips which extend into different finger holes in the rotatable dial member 2^b. Around this sheave extends a flexible member or cable 47 which is connected to the free end of the arm 38. Thus, as the spindle 37 is oscillated by the cam surfaces 35 or 36, the rotatable dial member of the telephone is also oscillated through arcs depending upon the length of the cam surfaces.

The cam carrying disc 32 is released or set in motion by the withdrawal of a bolt 51 from a shoulder or hole 32^a in the periphery of the disc. This bolt may be the armature of an electromagnet 52 which is located in both circuits controlled by the switches 11 and 13. That is, if either of the switches 11 or 13 are closed, the magnet 52 is excited, withdrawing the bolt 51, and allowing the motor mechanism to rotate the cam carrying disc.

The telephone systems are so arranged that a telephone number may not be called until a certain connection is made or switch 4 actuated. This switch is usually controlled by the raising of the receiver or the combination receiver and transmitter 5. In our apparatus this receiver or combination receiver and transmitter lies in a cradle 61 which may be provided at one end of a rocking lever 62. The opposite free end 62^a has a roller 62^b which rides on a track 32^b at the periphery of the disc 32. As the disc is released, the lever 62 is oscillated raising the receiver 5 from the telephone. The arms or cam riders 40 and 41 are so arranged that the disc 32 rotates slightly before the cam surfaces 35 or 36 engage and shift their respective arms 40 and 41, so that the telephone control switch 4 is first closed.

In our apparatus we have provided separate phonograph records C and D for transmitting different messages to the telephone transmitter when the respective switches 11 and 13 are closed, that is, in the case of either burglary or fire. These records are supported respectively on superimposed turntables 71 and 72, which are supported at the upper ends of concentric spindles 73 and 74. The spindle 74 is tubular and extends through the spindle 31, and is provided at its lower end with a rotating gear 76. The spindle 73 extends through the spindle 74 and is provided at its lower end with an operating gear 75. The gears 75 and 76 are rotated by

gears 77 and 78 through the axial portions of which freely extends a spindle 79. On the spindle 79 is also loosely mounted an operating gear 80 which meshes with the drive gear 23. The spindle 79 has at its upper end a clutch 79^a, which is normally held in a disengaged position with respect to the gear 80 by a spring 81. At the underside of the gear 33 is provided a circular cam 33^a, which is preferably of an arcuate extent of 360° less than the arcuate extent of the cam surfaces on the disc 32, but is positioned at the substantially diametrically opposite side from said cam surfaces. After the last cam surface of a particular series has engaged and oscillated the rider shoe 39, the cam 33^a will have rotated so that the cam 33^a engages the clutch 79^a and forces the same against the operating gear 80 and thereby rotating the spindle 79. The gears 77 and 78 are positively connected to the spindle 79 by a sliding clutch 81 having clutch portions 81^a, adapted to engage the gear 77, and a clutch portion 81^b adapted to engage the gear 78. The clutch 81 is shifted into engagement with the gear 77 by an electromagnet 82, and into engagement with the gear 78 by an electromagnet 83. The electromagnets 82 and 83 are located in the same circuits as the magnets 42 and 43 respectively, and the switches 11 and 13, respectively.

Thus, when the switch 11 is closed, the electromagnet 42 is energized drawing the rider 40 into the path of the series A of the cam surfaces, and simultaneously energizing the magnet 82, connecting the gear 75 to the motor and rotating the turntable 71 carrying the record C, however, after all of the cam surfaces of the series A have performed their functions.

Above each of the records C and D are mounted sound reproducers 91 and 92 which are connected to a unitary sound horn 93 which extends to the transmitter of the telephone.

It will, of course, be understood that any suitable sound reproducer may connect any suitable record to the transmitter of the telephone.

When a conventional telephone is used, it is merely placed in the sound proof enclosure 1, with the sheave 45 on the dial member 2^b, and the opening of the sound horn 93 over the transmitter.

Though we have shown and described a particular construction, combination, and arrangement of parts and portions, we do not wish to be limited to the same, but desire to include in the scope of our invention the construction, combination, and arrangement, substantially as set forth in the appended claims.

We claim:

1. In a signaling apparatus, a rotatable telephone dial, a sheave secured coaxially thereto, a cam having a cam surface corresponding to a number on the dial, a motor for operating the same, a rider normally held against the cam surface, and a flexible member connected to the rider and extending around the sheave.
2. In a signaling apparatus, a rotatable telephone dial, a sheave secured coaxially thereto, a cam having cam surfaces corresponding to numbers on the dial, a motor for operating the same, a rider normally held against the cam surfaces, and a flexible member connected to the rider and extending around the sheave.
3. In a signaling attachment for a telephone having a rotatable dial, a sheave detachably securable to and coaxial with the dial, a cam having a cam surface corresponding to a number

on the dial, a motor for operating the same, a rider normally held against the cam surface, and a flexible member connected to the rider and extending around the sheave.

4. In a signaling attachment for a telephone having a rotatable dial, a sheave detachably securable to and coaxial with the dial, a cam having cam surfaces corresponding to numbers on the dial, a motor for operating the same, a rider normally held against the cam surfaces, and a flexible member connected to the rider and extending around the sheave.

5. In a signaling apparatus, a rotatable telephone dial, a sheave secured coaxially thereto, a cam means having a plurality of series of cam surfaces, each surface corresponding to a number on the dial, means for operating the cam means, and means operatively connecting one of said series of cam surfaces to cooperate with said sheave.

6. In a signaling apparatus, a rotatable telephone dial, a sheave secured coaxially thereto, a cam means having a plurality of series of cam surfaces, each surface corresponding to a number on the dial, means for operating the cam means, separate riders, one adapted to ride upon the cam surfaces of each series, means for shifting one rider into the path of the cam surfaces of one series, and a flexible member connected to the riders and extending around the sheave.

7. In a signaling apparatus, a rotatable telephone dial, a sheave secured coaxially thereto, operating means having a plurality of series of operating devices, each of the operating devices corresponding to a number on the dial, means for operating the operating means, and means operatively connecting one of said series of cam surfaces to cooperate with said sheave.

8. In a signaling apparatus, a rotatable telephone dial, a sheave secured coaxially thereto, operating means having a plurality of series of operating devices, each of the operating devices corresponding to a number on the dial, a motor for operating the operating means, a plurality of connecting means, one adapted to be connected to the devices of one series, means for shifting one of the connecting means into the path of one series of operating devices, and a flexible member connected to the connecting means and extending around the sheave.

9. In a signaling apparatus, a rotatable telephone dial, a sheave secured coaxially thereto, operating means having a plurality of series of operating devices, each of the operating devices corresponding to a number on the dial, a motor for operating the operating means, a plurality of connecting means, one adapted to be connected to the devices of one series, means for shifting one of the connecting means into the path of one series of operating devices, a flexible member connected to the connecting means and extending around the sheave, and a plurality of initiating means, each corresponding to a series of operating devices, and each simultaneously releasing the motor and operating the shifting means for shifting a connecting means to cooperate with its respective series of operating devices.

10. In a signaling means, a rotatable telephone dial, operating means having a plurality of series of operating devices, each of the operating devices corresponding to a number on the dial, a motor for operating the operating means, a plurality of connecting means operatively connected to the dial, one adapted to be connected to the

devices of one series, means for shifting one of the connecting means into the path of one series of operating devices, and a plurality of initiating means, each corresponding to a series of operating devices, and each simultaneously releasing the motor and operating the shifting means for shifting a connecting means to cooperate with its respective series of operating devices.

11. In a signaling means, a rotatable telephone dial, operating means having a plurality of series of operating devices, each of the operating devices corresponding to a number on the dial, a motor for operating the operating means, a plurality of connecting means operatively connected to the dial, one adapted to be connected to the devices of one series, a plurality of sound reproducers, one for each series of operating devices, means for shifting one of the connecting means into the path of one series of operating devices and for shifting into operative position the corresponding sound reproducer, and a plurality of initiating means, each corresponding to a series of operating devices, and each simultaneously releasing the motor, and operating the shifting means for shifting a connecting means to cooperate with its respective series of operating devices and for shifting the corresponding sound reproducers.

12. In a signalling means, a rotatable telephone dial, operating means having a plurality of series of operating devices, each of the operating devices corresponding to a number on the dial, a motor for operating the operating means, a plurality of connecting means operatively connected to the dial, one adapted to be connected to the devices of one series, a plurality of sound reproducers, one for each series of operating devices, means for shifting one of the connecting means into the path of one series of operating devices and for shifting into operative position the corresponding sound reproducer, a plurality of initiating means, each corresponding to a series of operating devices, and each simultaneously releasing the motor, and operating the shifting means for shifting a connecting means to cooperate with its respective series of operating devices and for shifting the corresponding sound reproducers, and means for connecting the sound reproducers to the motor after initial operation of the dial.

13. In a signaling apparatus, the combination with a telephone having a connecting switch, and also having a transmitter, a plurality of sound reproducers, unitary means for operating the sound reproducers, clutch means for connecting each sound reproducer separately with said operating means, a plurality of initiating means, one corresponding to each sound reproducer, each initiating means separately closing said switch and operating said clutch means for connecting the respective sound reproducer with the operating means.

14. In a signaling apparatus, a rotatable telephone dial, a sheave operatively connected to the dial, a cam having a cam surface corresponding to a number on the dial, a motor for operating the same, a rider normally held against the cam surface, and a flexible member connected to the rider and extending around the sheave.

15. In a signaling apparatus, a rotatable telephone dial, a sheave operatively connected to the dial, a cam having cam surfaces corresponding to numbers on the dial, a motor for operating the same, a rider normally held against the cam

surfaces, and a flexible member connected to the rider and extending around the sheave.

16. In a signaling apparatus, a rotatable telephone dial, a sheave operatively connected to the dial, a cam means having a plurality of series of cam surfaces, each surface corresponding to a number on the dial, means for operating the cam means, and means operatively connecting one of said series of cam surfaces to cooperate with said sheave.

17. In a signaling apparatus, a rotatable telephone dial, a sheave operatively connected to the dial, a cam means having a plurality of series of cam surfaces, each surface corresponding to a number on the dial, means for operating the cam means, separate riders, one adapted to ride upon the cam surfaces of each series, means for shifting one rider into the path of the cam surfaces of one series, and a flexible member connected to the riders and extending around the sheave.

18. In a signaling apparatus, a rotatable telephone dial, a sheave operatively connected to the dial, operating means having a plurality of series of operating devices, each of the operating devices corresponding to a number on the dial, means for operating the operating means, and means operatively connecting one of said series to cooperate with said sheave.

19. In a signaling apparatus, a rotatable telephone dial, a sheave operatively connected to the

dial, operating means having a plurality of series of operating devices, each of the operating devices corresponding to a number on the dial, a motor for operating the operating means, a plurality of connecting means, one adapted to be connected to the devices of one series, means for shifting one of the connecting means into the path of one series of operating devices, and a flexible member connected to the connecting means and extending around the sheave.

20. In a signaling apparatus, a rotatable telephone dial, a sheave operatively connected to the dial, operating means having a plurality of series of operating devices, each of the operating devices corresponding to a number on the dial, a motor for operating the operating means, a plurality of connecting means, one adapted to be connected to the devices of one series, means for shifting one of the connecting means into the path of one series of operating devices, a flexible member connected to the connecting means and extending around the sheave, and a plurality of initiating means, each corresponding to a series of operating devices, and each simultaneously releasing the motor and operating the shifting means for shifting a connecting means to cooperate with its respective series of operating devices.

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