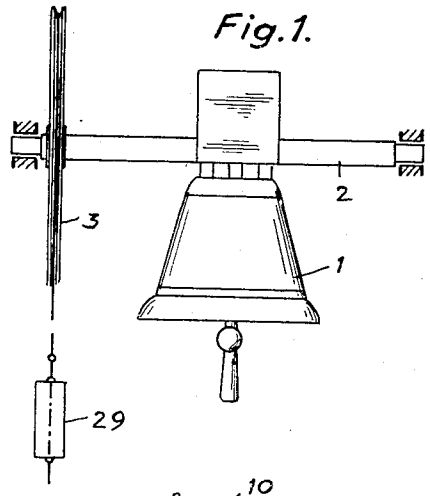
Sept. 26, 1933. F. R. PLAGENS 1,927,901

BELL RINGING DEVICE

Filed July 14, 1930

Fig. 1.



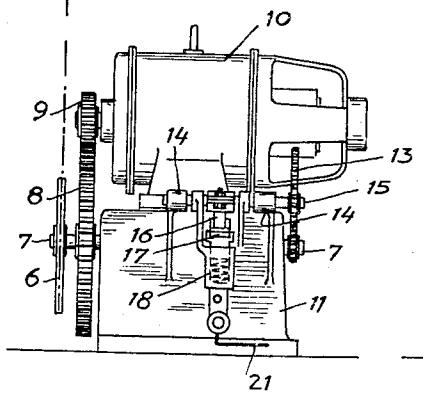
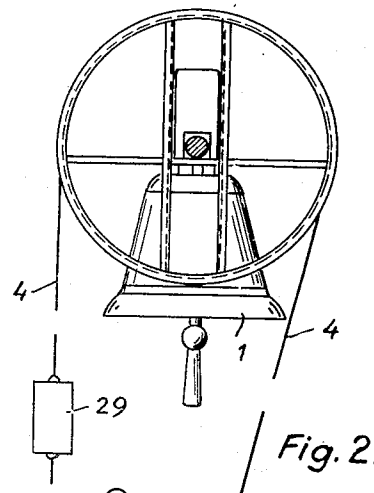


Fig. 2.



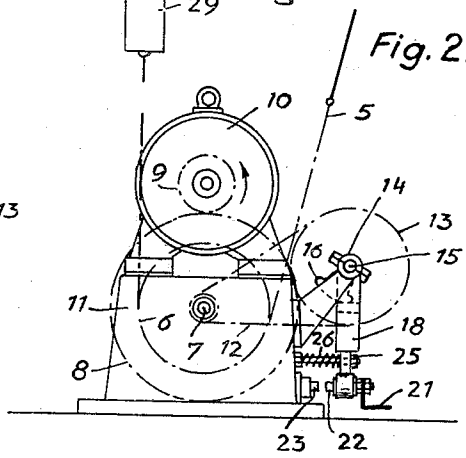


Fig. 3.

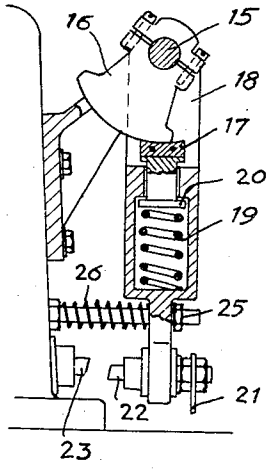
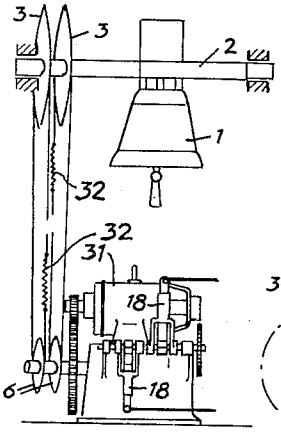


Fig. 5.



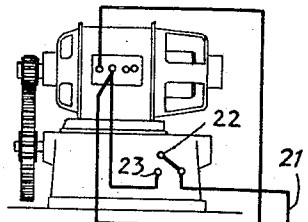


Fig. 4.

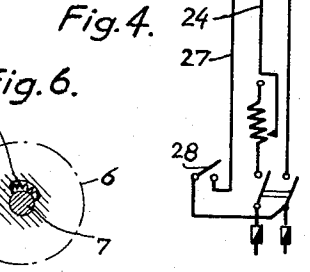


Fig. 6.

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1,927,901

BELL RINGING DEVICE

Friedrich Richard Plagens, Berlin-Pankow, Germany

Application July 14, 1930, Serial No. 467,827, and in Germany May 4, 1929

5 Claims. (Cl. 177—288)

The invention relates to a bell-ringing device, driven by means of an electric motor, of the type in which, on the one hand, the working current is cut off by one or more automatic switching devices before the end of each swinging out movement of the bell and, on the other hand, the turning back of the motor shaft is effected or started from the bell by its return movement. It is characterized by the feature that the switching device comprises two friction members one of which is coupled to the motor shaft while the other is carried by a swinging contact so as to be engaged by the first friction member for temporarily moving its contact into engagement with a fixed contact during the movement of the bell.

The subject matter of the invention possesses, inter alia, the advantage that it pulls the bell as gently as if it were pulled by the human hand and swings it up gradually and causes the contact parts to close with certainty and to open without any appreciable sparking, and that it affords the possibility of easy adjustment in relation to the bell.

The invention is illustrated by way of example by the accompanying drawing of which

Fig. 1 shows a side view of the whole device;

Fig. 2 shows a front view;

Fig. 3 an enlarged section through the pendulum arm;

Fig. 4 is a diagram of connections;

Fig. 5 shows a plant with a reversing motor and two rope pulleys; and

Fig. 6 is a diagrammatic representation of a detail.

1 is a bell which hangs on a shaft 2 that carries a rope pulley 3. The latter is connected by an endless transmission member, formed by a rope 4 and a chain 5, with the chain wheel 6 on a shaft 7, on which is fixed a toothed wheel 8 that is in engagement with a pinion 9 of an electric motor 10. The parts 6, 7 and 8 form a reduction gear which is carried by a box 11 that supports the motor 10.

On one side of the box there is located a switching dvice for the working current, this switching device being driven at a greatly reduced speed by the shaft 7, chain 12 and chain wheel 13. The switching device consists of a rotation shaft 15, journalled at 14, upon which a cam segment 16 is adjustably fixed. The latter serves as part of a friction gear completed by an exchangeable cheek 17 which works axially in a pendulum arm 18 loosely, mounted on the rotation shaft 15. The cheek is acted upon by a spring 19 and its movement in the direction of the cam 16 is limited by a stop 20. The free end of the arm has a contact pin 22 which is connected to the conductor 21 and, on making contact with the counter-contact 23, closes the circuit of the conductors 21 and 24. 25 denotes a stop that limits the rearward movement of the arm 18 imparted thereto by a spring 26. 27 is a branch of the conductor 21 provided with a hand-switch 28 for starting the device.

The device works as follows:

In Figs. 1 and 2 the individual parts of the installation are in the position of rest. For starting up, the switch 28 is closed so that current passes, by way of conductor 27, into the motor, which runs in the direction indicated by the arrow in Fig. 2, and the bell 1 is moved to the left. At the same time the friction cam 16 and friction cheek 17 produce the actuation of the pendulum arm 18 the contact 22 of which after a time comes into contact with the counter-contact 23, so that the motor, even on the switch 28 being opened in the meantime, receives current until the cam 16 passes off the cheek 17. In this instant, the arm 18 runs back into its initial position under the action of the spring 26. The result of the disturbance of the supply of current produced in this way is that the motor no longer accelerates the bell which, in accordance with the small movement impulse it has received, soon stops and swings back, in doing which it changes the direction of rotation of the de-energized motor. The turning back of the motor shaft 7 causes the cam 16 to run on to the cheek 17 and to travel thereon in addition through a distance which corresponds to the movement of the bell, that is swinging back, from the middle position to the right. On the resumed reversed movement of the bell, the direction of rotation of the motor is again changed. Shortly after, the contact 22 that is moved by the friction gear 16, 17, closes the circuit which now remains closed for a longer period, so that the bell again swings out. The greater return distance now again represents a longer friction path between the cam 16 and the cheek 17, thus producing a greater driving impulse. This action is continued until the bell has attained its usual stroke, whereupon the condition of continuance sets in.

It may be seen from the mode of operation that the motor begins to develop its power when the bell has completed its reversed movement and that it ceases to deliver power when the bell swings out. Owing to the adjustable arrange-

ment of the cam 16, one is in a position to rapidly adjust the switching device, so that the ringing device can be adapted without trouble to the prevailing circumstances.

29 represents a weight which is used for balancing the braking action of the motor and which is provided in the vertically arranged pulley rope 4, 5. In order to make the drive of the bell as gentle as possible, the chain wheel 6 is operatively connected with the shaft 7 by means of a yielding body—e. g., by means of a spring 30.

For bell-driving gears with a motor pinion directly connected by a pulley rope with the bell-rope pulley, it is proposed to provide a readily exchangeable lining in the rope groove for rapidly altering the diameter of the rope pulley. In such driving gears, the switching device is arranged on the side of the motor, so that the whole apparatus becomes, owing to the omission of the box, especially simple and advantageous.

According to Fig. 5 the invention is extended to the following effect:—In conjunction with a reversing motor 31, two pendulum arms are provided preferably on a common rotation axle 15 and are placed in relation to each other to correspond to the stroke of the bell for the purpose of driving the bell after each reversal of movement. This arrangement is especially suitable for small bells the masses of which are not sufficiently great to cause them, on being subjected to only a one-sided drive, to swing sufficiently far to the other side.

In such installations it is also advisable to use two pulley ropes between the motor and the bell, and to insert a spring element 32 at one side of one rope and at the opposite side of the other rope.

The tight sides part of the rope gears will serve the purpose of transmitting the movement of the chain wheel 6 to the rope pulley 3 without slipping, whilst the loose sides with the inserted spring 32 will prevent undesirable great tensions occurring between the shafts 2 and 7.

By adjusting the stop 25, the travel of the contact 22, and consequently the distance through which the bell must travel before it is accelerated by the motor, can be regulated. The acceleration of the bell by the motor only after its self-acceleration saves current and preserves the whole installation. When demanded by the nature of the current, two movable contacts 22 are arranged which co-operate with corresponding counter-contacts 23.

I claim:

1. An electric bell-ringing device of the character described, comprising an electro-motor, a gearing connecting said motor with the bell, a switching device for said motor comprising a fixed contact and a swinging contact, means tending to maintain said contacts open, a friction member on said swinging contact, a shaft operated by the motor, and a friction member mounted on said shaft in position to engage said former friction member and to hold the swinging contact temporarily in engagement with the fixed contact.

2. A structure as claimed in claim 1 wherein the swinging contact is suspended from the shaft.

3. An electric bell-ringing device of the character described, comprising an electro-motor, a gearing connecting said motor with the bell, a pair of circuits for supplying current to and reversing the motor, a switch in each circuit, each switch comprising a fixed contact and a swinging contact, a friction member on each swinging contact, means tending to maintain said contacts open, a shaft coupled to the motor, and a friction member mounted on said shaft for each swinging contact in position to engage the friction member of the latter and hold the contacts temporarily together.

4. In a bell ringing device, a bell, means for oscillatably mounting said bell, an electric motor, drive means between said motor and said bell for oscillating the latter, an electric circuit for said motor including a switch having co-operating contacts, movable means having one of said contacts thereon and causing said contacts to engage when in one position and maintaining said contacts disengaged in a second position, said movable means having a bearing surface, means normally urging the movable means into said second position, drive means having a co-operating bearing surface, connecting means between said motor and the said drive means for moving the latter in proportion to the movement of the bell, and means for frictional engagement of said bearing surfaces for portions of the movement of the said drive means whereby said movable means is moved to first position.

5. In a bell ringing device, a bell, means for oscillatably mounting said bell, an electric motor, drive means between said motor to said bell, an electric circuit for said motor including a switch having two co-operating contacts, a member having one of said contacts thereon, and adapted in one position to engage said contacts and in a second position to maintain said contacts disengaged, means for movably mounting said member, means normally urging said member into said second position, a segmental member having a bearing surface, means for oscillatably mounting the last named member, drive means between said motor and the last named member, and an element on said first member having a bearing surface, means tending to maintain said bearing surfaces frictionally engaged and means for adjusting the relative positions of said bearing surfaces when the bell is in still position.

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