Feb. 14, 1939. G. BINIEK 2,147,233

TELEPHONE CALL FEE INDICATOR

Filed July 27, 1936

FIG. 1

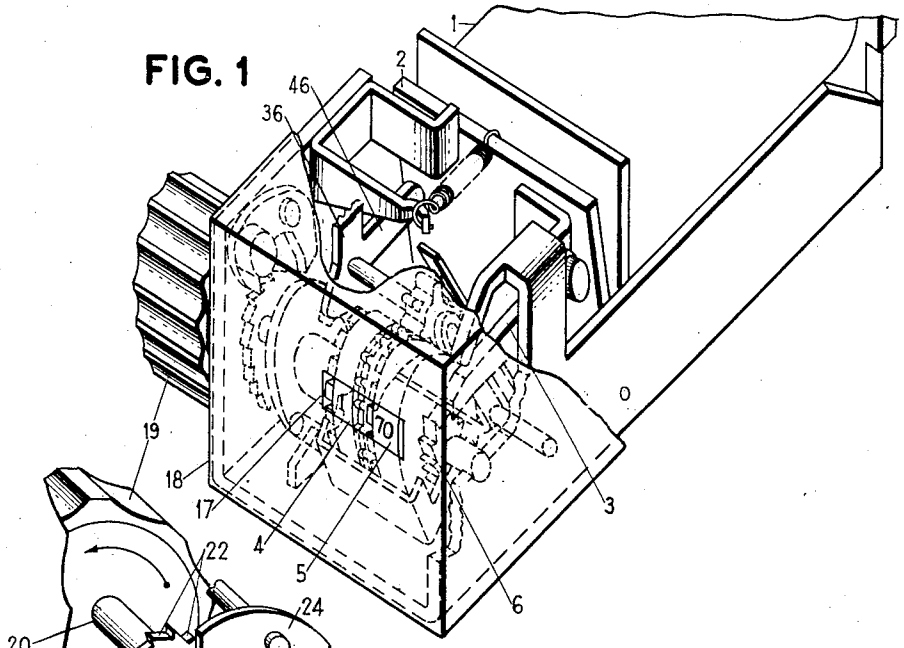
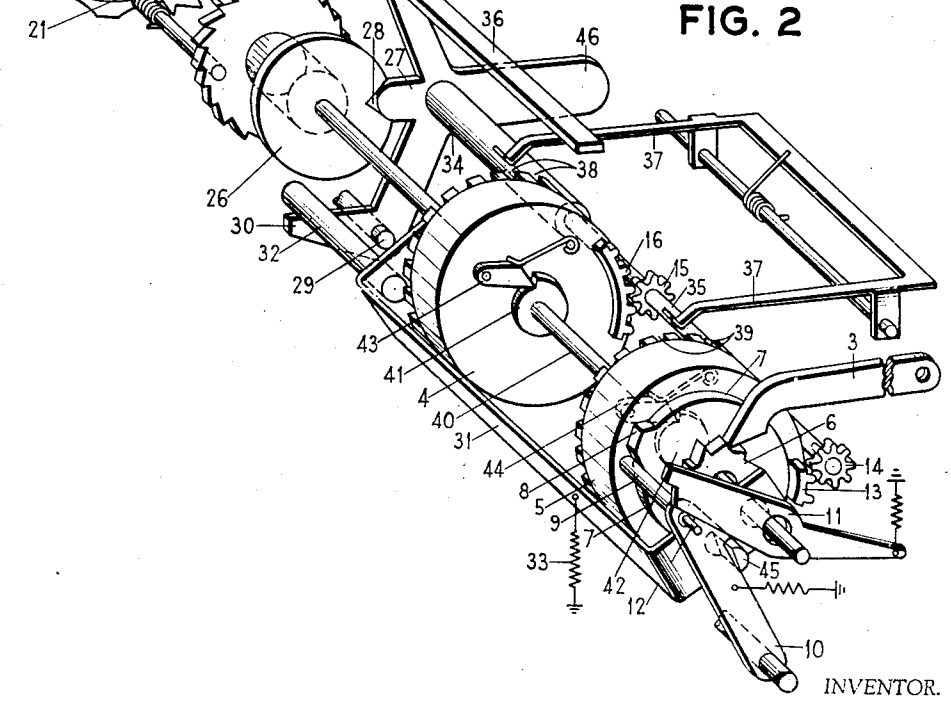


FIG. 2



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TELEPHONE CALL FEE INDICATOR

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8 Claims. (Cl. 235—130)

In hotels and other premises the proprietor of a telephone connected to an automatic exchange has frequently to allow his guests the use of the telephone for setting up high valued calls. It is therefore desirable to know immediately on the termination of the call to what extent the guest is indebted to the proprietor. The fee indicator, according to the invention, which is connected to the exchange line but is preferably separate from the telephone set and is, for example, situated with a person supervising the call, has been developed for this purpose. According to the value of a call, impulses are registered in the time-zone equipment of the automatic exchange and after the termination of the call are automatically transmitted to the control magnet of the fee indicator. This displaces indicating members in accordance with the number of impulses received so that the supervisory party is in a position to read off the call fee immediately and to inform the person making the call.

According to the invention means are provided at the fee indicator which enable the supervising party to return the register drum from its set position to rest without rendering it possible for him to influence the register device in any other way, for example, to his advantage. This is achieved according to the invention in that on the transmission of impulses from the exchange devices for indicating the fee on the register drum, a locking lever associated with the restoring device which is operated by hand is moved out of action and returns to the locking position again automatically when the indicating device has been restored to normal. On initiating the manually operated restoring motion the indicator opening in the protective cover of the fee indicator is closed by a shutter which is only returned to its starting position thereby disclosing the indicator opening after the indicator member has been completely returned to zero.

The drawing represents an embodiment of a fee indicator according to the invention.

Fig. 1 shows a projection of the fee indicator with the protective cover removed at the sides.

Fig. 2 shows a projection of the mechanism of the feed indicator on a considerably enlarged scale.

The impulses communicated to the control magnet 1 from the time-zone equipment in the automatic exchange (not shown) after the termination of a conversation operate the armature 2. By means of its impulse pawl 3 it accordingly switches the register drums 4 and 5 round to a definite position in accordance with the number of impulses received. Simultaneously with the completion of the first switching impulse by the pawl 3 at the driving wheel 6 the cam disc 7 is carried round. Its cam 8 thereupon presses back the locking lever 10 by means of pin 9, the lever being held in this position by a further locking lever 11 which becomes locked against the extension 12 of the pin 9 until the register drums 4 and 5 have been restored to the zero position. On the tenth impulse the drum 4 (drum 4 shows the feed in marks and drum 5 in pfennigs) is also advanced a step forward in known manner by way of the toothed segment 13 on drum 5, the rigidly connected pinions 14 and 15 and the toothed rim 16 on the drum 4.

As is shown for example in Fig. 1 the electromagnet received 17 impulses from the exchange. In the indicating opening 17 of the protective container 18 the mark drum 4 stands on "1" while the pfennig drum indicates "70". After the amount of the fee for example 1.70 marks has been communicated to the calling party by the person supervising the call, the latter restores the indicating device to the normal position by rotating the knob 19 projecting through the container 18, in the direction of the arrow. This takes place as follows:

The toothed wheel 21 rigidly mounted on the same shaft 20 as the knob 19 is rotated with the knob. The pawl 25 which has a spring engagement with the teeth 22 of the wheel 21 and which is fixed to the escapement mechanism 23, 24 thus takes with it the locking wheel 23 and the cam disc 26 rigidly connected with it. Pawl 24 of the escapement mechanism acts as a retarding device which permits a step-by-step rotation of locking wheel 23 when the knob 19 is rotated by hand in the direction of the arrow. It will be noted that that part of the pawl 24 to the left of the shaft on which it is mounted is larger and therefore heavier than the right-hand end of the pawl, consequently the pawl is held in the position shown in the drawing by the force of gravity. When the knob 19 is turned manually, in a direction indicated by the arrow, carrying with it the ratchet wheel 23, the left-hand end of pawl 24 is forced to ride up over the top of the next tooth of the ratchet wheel. When this occurs the right-hand end of the pawl 24 is forced into engagement with a succeeding tooth thus arresting the motion of the ratchet wheel 23, and the knob 19 to which it is coupled, after it has moved one step. At this

time the pressure exerted on the knob 19 maintains the right-hand end of the pawl 24 in engagement with the front of a tooth of the ratchet wheel 23, with the left-hand end of the pawl 24 elevated and disengaged from the ratchet wheel. It is now necessary to release the pressure on the knob 19 to permit the left end of the pawl 24 to drop into engagement with the ratchet wheel. When this occurs, the knob 19 may again be turned to advance the ratchet wheel another step. This interaction between the ratchet wheel 23 and the pawl 24, which is similar to the escapement action of a clock, continues until the lever 27 is permitted to drop into the notch 28 in the disc 26, upon which, further motion of the knob 19 is prevented by the action of projection 45, on shutter 31, and the lever 10, as will be hereinafter described. The increased weight of the left-hand end of the pawl 24 is provided by a protuberance 47, which is rigidly attached to and forms a part of the pawl 24. The lever 27 is accordingly moved out of the depression 28 in the cam disc 26 and pivots about the rod 29. The rotation of the lever 27 promotes four further operations:

1. The arm 30 raises the shutter 31 on the pin 32 against the pull of the spring 33 and closes the indicator aperture 17. The shutter 31 remains behind the opening 17 until the lever 27, after a complete revolution of the cam disc 26, again sinks into the depression 28. Rotating the knob 19 backwards cannot influence the mechanism for the pawl 25 then slides over or moves out of engagement with the teeth 22 of the wheel 21.

2. The projection 46 directed toward the armature 2 presses the armature back slightly and thus withdraws the impulse pawl 3 from the teeth of the driving wheel 6. This prevents any jamming of the mechanism in the event of the magnet receiving an impulse during the resetting of the indicator.

3. The bush 34 affixed to the lever 27 serves as a mounting for the shaft 35 on which the pinions 14 and 15 are rigidly fixed. When the lever is displaced the pinions are moved out of engagement with the advancing teeth 13, 16, of the register drums 4 and 5.

4. An extension 36 of the lever 27 depresses the springs 37 into the teeth 38 and 39 on the register drums 4 and 5 to act as a detent to prevent any undesirable motion or over running of the drums on the return to the zero position.

Only when the lever 27 has effected the four operations set out above do the register drums return to normal. These drums are rotatably mounted on the shaft 40 rigidly fixed to the cam disc 26. At the sides of the register drums are arranged the discs 41 and 42 which are rigidly mounted on the shaft 40 and at their periphery engage pawls 43 and 44 which have spring attachments to the sides of the register drums. On the rotation of the knob 19 in the direction of the arrow, the discs 41 and 42 are carried round and bring the register drums 4 and 5 to rest by the pawls 43 and 44 springing into their recesses in the said discs. The lever 27 then drops into the depression 28 in the cam disc 26 and the precautionary devices described in paragraphs 1 to 4 above are restored. The shutter 31 is also withdrawn to its original position by spring 33 and the indicator aperture 17 is once more visible. When the shutter 31 is first raised to its operated position as described under (1), above, the projection 45 which is rigidly fastened, at one end, to the right-hand arm of the shutter and extending beyond the plane of latch 11, at the other end, engages the lower surface of latch 11, thus raising it out of engagement with the pin 12. The locking lever 10 is now drawn inward by the spring associated therewith until the rod 9 engages the surface of the cam disc 7, the projection 45 and the latch 11 remaining in an elevated position. When now the lever 27 is permitted to drop into the depression 28 of disc 26, the shutter 31 carrying with it the projection 45 is permitted to drop. The projection 45 rides downward over the raised surface of locking lever 10 and is thereupon latched into position. Since now the shutter 31 is locked in position by the projection 45 and the locking lever 10, the lever 27 cannot be moved out of the depression 28. Therefore the disc 26 cannot be turned and further motion of the knob 19 in the direction of the arrow is thus prevented. In this position the shutter engages with the locking lever 10 by way of a projection 45 fixed to the shutter thus preventing further rotation of the knob in the direction of the arrow. As previously mentioned, on setting the register drum 5 the lever 10 is displaced by the cam 8 on the disc 7 which moves with the drum, the restoring device being thus released.

What is claimed is:

1. In a registering device, registering means having a normal position, means for operating said registering means from normal position to display the indicia thereon, manually operated restoring means normally locked against operation for restoring said registering means to normal position, and a locking lever displaced in response to the operation of said registering means for unlocking said restoring means to permit manual operation thereof and for automatically relocking said restoring means after said registering means have been completely restored to normal position.

2. In a registering device as claimed in claim 1 including a rotatable knob for manually operating said restoring means, a cam disc rotated by the manual operation of said knob, a lever displaced in response to the rotation of said cam disc, and a shutter operated in front of said registering means responsive to the displacement of said lever.

3. In a registering device as claimed in claim 1 including a rotatable cam disc having a normal position in said restoring means, said cam disc operated in response to the operation of said restoring means for restoring said registering means, a shutter having a normal position, a lever operated by said cam disc for moving said shutter from normal position to a position in front of said registering means, and means including said lever for returning said shutter to its normal position only when said cam disc and said registering means are restored to normal.

4. In a registering device as claimed in claim 1 including a rotatable knob for manually operating said restoring means, and a pawl and ratchet drive escapement mechanism coupling said knob to said restoring means for allowing said restoring means to be operated in only one direction.

5. In a registering device as claimed in claim 1 including a spring detent operable into engagement with said registering means during restoration thereof, means for disengaging said register operating means during restoration of said registering means, and a lever operated in re-

sponse to the operation of said restoring means for operating said spring detent and said disengaging means.

6. In a registering device as claimed in claim 1 including a cam disc operated in response to the operation of said registering means for displacing said locking lever to unlock said restoring means, and a second lever for maintaining said locking lever in displaced position during the restoring operation.

7. In a registering device as claimed in claim 1 including a shutter having a projection normally engaged and locked by said locking lever for maintaining said restoring means locked against manual operation, a cam disc operated in response to the operation of said registering means for displacing said locking lever from in locked engagement with said projection to unlock said restoring means, and a second lever for maintaining said locking lever in displaced position during the restoring operation.

8. In a registering device as claimed in claim 1 wherein said register operating means includes a stepping pawl and a toothed wheel connected to said registering means, and means including a lever operated in response to the operation of said restoring means for disengaging said pawl from said toothed wheel during the restoring operation.

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