United States Patent

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[54] CHECKING DEVICE FOR CHECKING THE PRESENCE OF PERSONNEL

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[51] **Int. Cl.**.....**G06f 7/46**

[58] **Field of Search**.....235/92 AC, 92 FP, 92 PD, 92 T; 340/330, 309.1–309.6; 346/52, 80, 91; 324/181, 182

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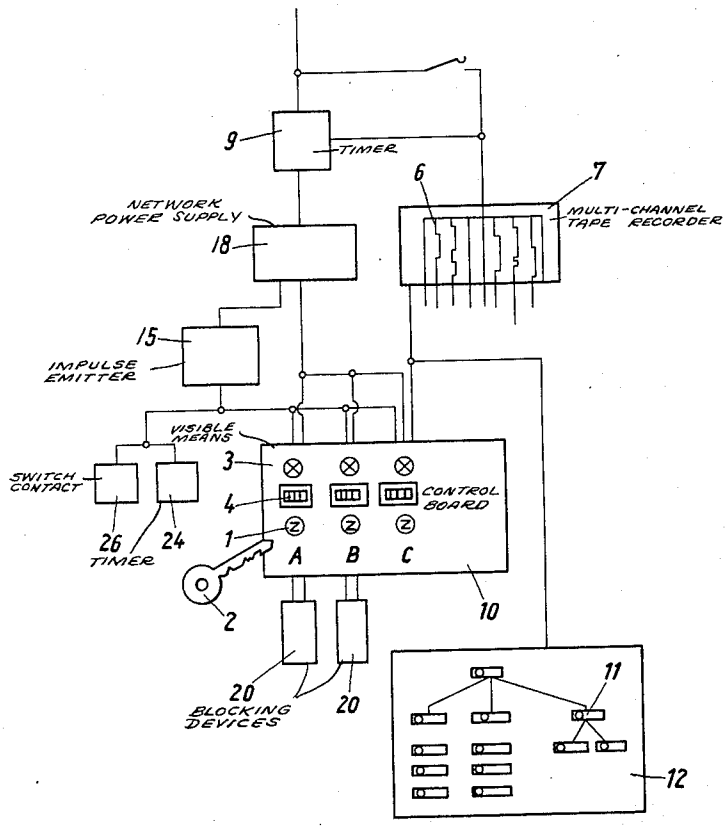
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[57] **ABSTRACT**

A control device for checking the time during which several persons belonging to an office or factory are present, which comprises a plurality of switches respectively allotted to the persons whose presence is to be checked and also comprises a plurality of counting means respectively associated with said switches while the circuit means comprising said switches and said counting means comprise for each switch a blocking device adapted in response to the failure of the person whose presence is to be checked to switch off the switch during a work break to block the pertaining counting means from resetting.

22 Claims, 3 Drawing Figures



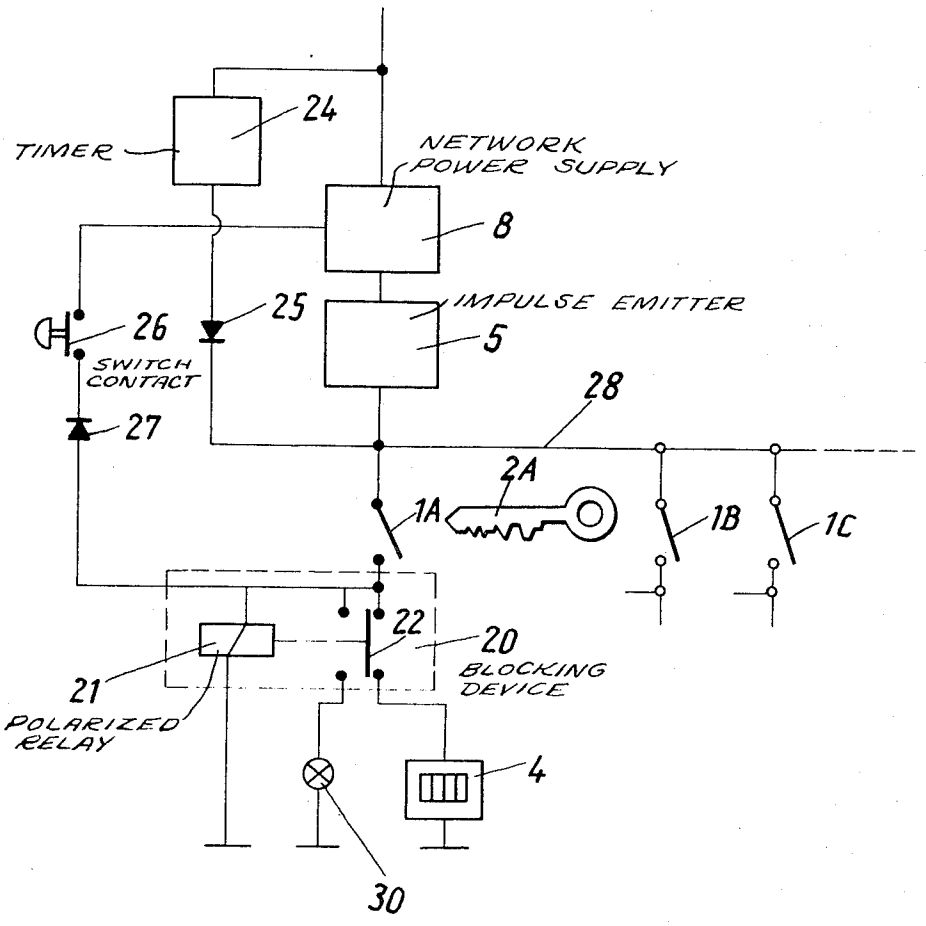


Fig. 1

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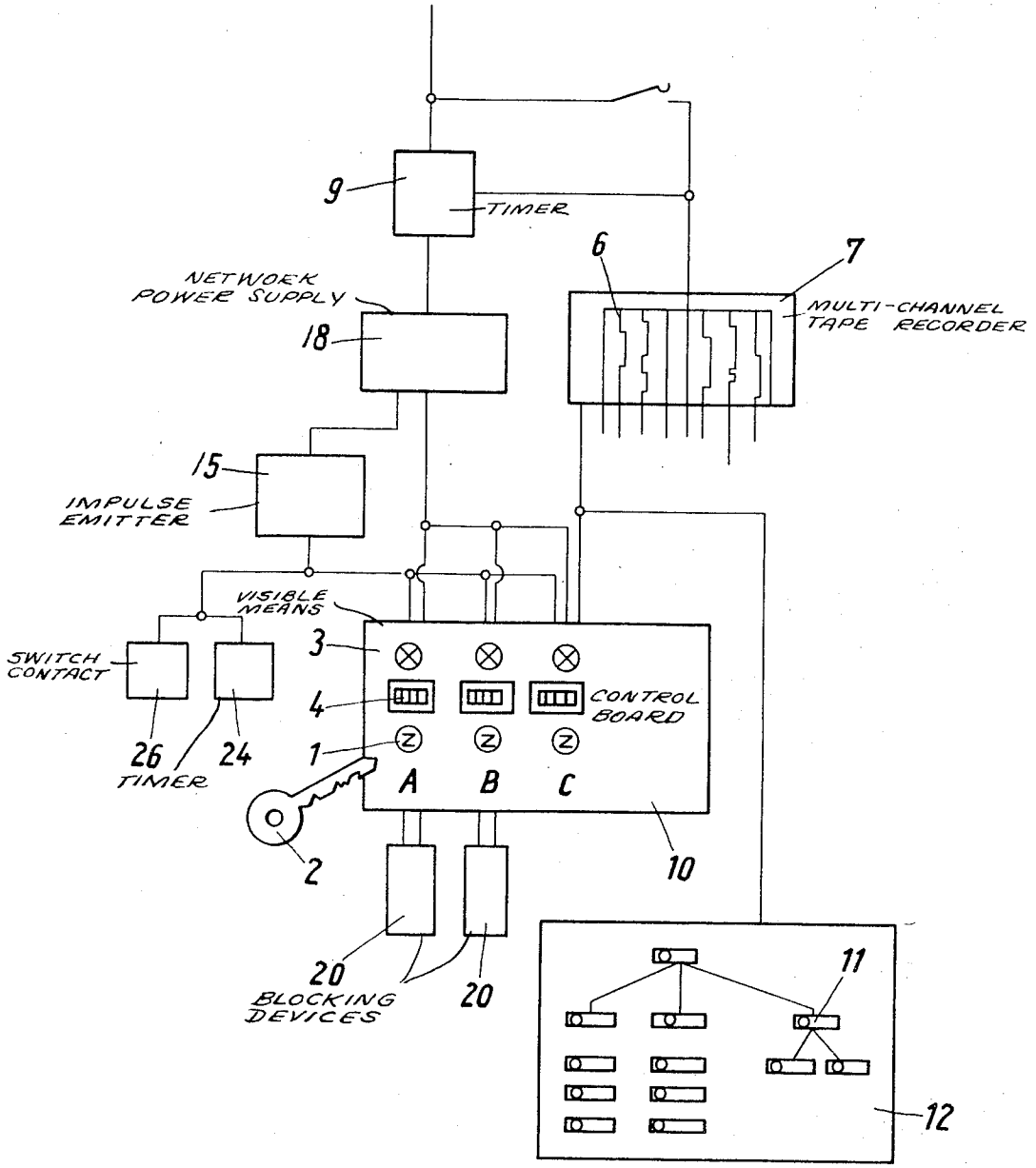


Fig. 2

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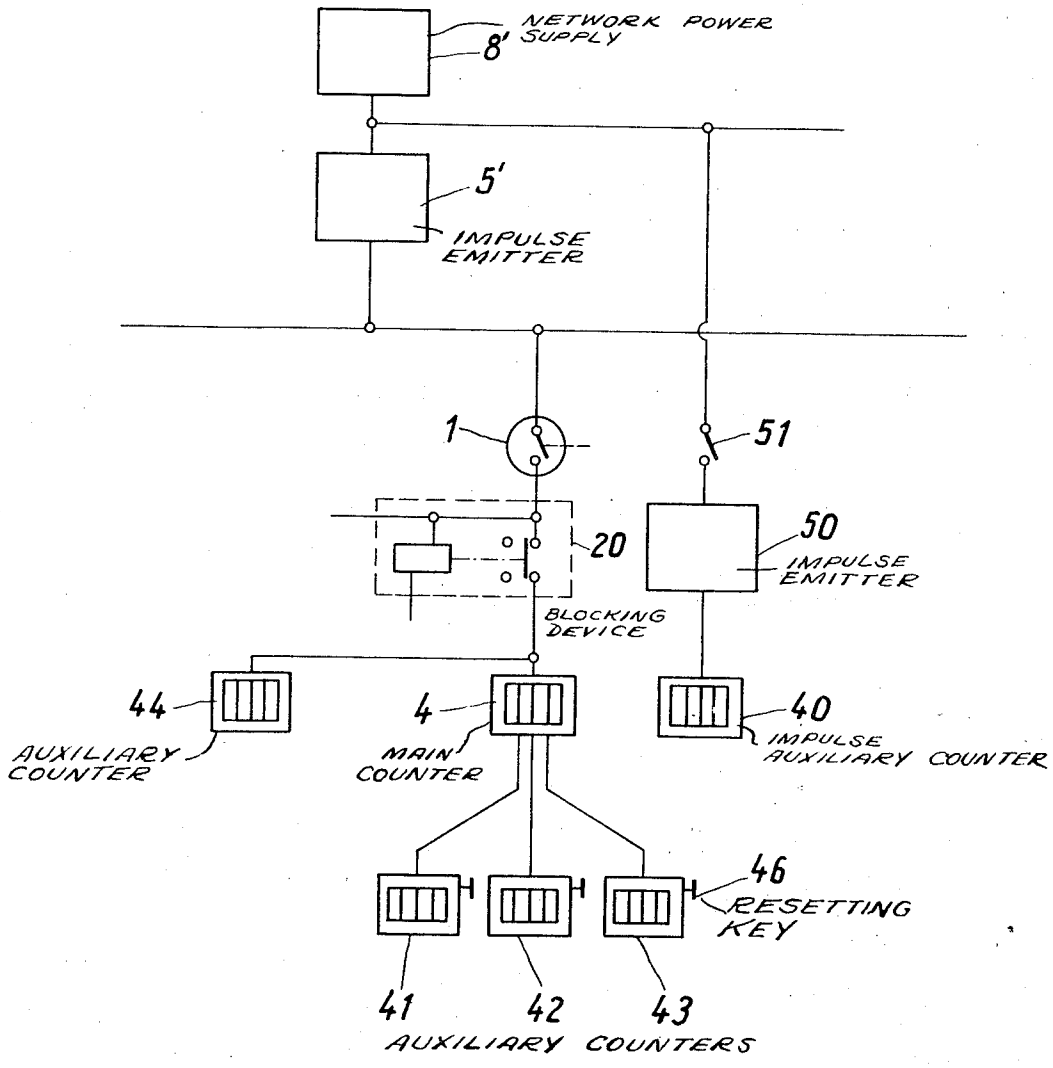


Fig. 3

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CHECKING DEVICE FOR CHECKING THE PRESENCE OF PERSONNEL

The present invention relates to a control device for checking the time during which several persons belonging to an office or factory are present and, more specifically, concerns a device of this type which comprises a switch pertaining to each of these persons and also comprises an integrating counting device as personnel unit which is connected to said switches, said counting unit being adapted to be turned on by the respective person to be checked via the switch when said person begins to work and also being adapted to be turned off when said person has completed his work, the switching-on and switching-off being effected by means of an actuating device, especially a safety key.

Inasmuch as the control device is to be actuated by the person to be checked while on the other hand the device should indicate, whether the person to be checked has actually put in the required number of working hours for a certain pay period, it is necessary to eliminate any possibility of misusing the checking device. The foregoing is important in particular when no fixed working time is set which means that the respective person can freely select the time of beginning and ending his working hours. If the person to be checked would at the end of his working day not turn off the counting device, the latter would continue to run and would under these circumstances indicate a longer presence than corresponds to the actual presence.

It is, therefore, an object of the present invention so to design a checking device of the above-mentioned type that the above-mentioned misuse cannot occur or at least cannot occur unnoticed.

This object and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawings, in which:

FIG. 1 diagrammatically illustrates a checking device according to the invention.

FIG. 2 diagrammatically illustrates a modified checking device according to the invention with a number of control units corresponding to the number of persons to be checked, said control units being combined to groups.

FIG. 3 diagrammatically illustrates a third embodiment of the invention in which the counting mechanism registering the total working time is followed by a plurality of subcounting mechanisms for registering individual working operations within the said total working time.

The checking device according to the present invention is characterized in that it comprises a blocking device which is connected to the switch and the counting mechanism in such a way that when the checking device is not turned off, it will make the counting device ineffective and cannot be reset to the original condition by the person to be checked. Preferably, the blocking device is put into action by an electric impulse which at a certain time is introduced into the checking device when all persons to be checked are absent as, for instance, during the night. When one of the switches at the end of the work period has not been switched off by the respective person to be checked, it will be impossible for said person at the beginning of the next work period to turn on the switch in order to make the counting mechanism effective again. This person then has to report to a control station which has the suitable means to make the blocking device ineffective. In view of this automatic indication of a failure to switch off the checking device, there is created a possibility to deduct the excess time which has been entered by the counting mechanism.

With a checking device of this type a very reliable control is possible as to the actual working hours a person to be checked has put in for a certain pay period, for instance, for a week or a month.

To an ever increasing extent, organizations and factories permit their workers to select within certain limits the begin and the end of their work day. In such an instance it is possible by means of a central control device to obtain the precise data on the basis of which the pay is calculated. However, the individual person to be checked is unable by means of such checking device to ascertain how many hours he has actually worked in a certain pay period, for instance, in a week. However, such indication is above all desirable in order to be able to determine how the remaining work hours can best be distributed most favorably in accordance with the prevailing conditions over the rest of the days of the pay period without falling short of the required total number of hours for a certain pay period.

It is, therefore, also an object of the present invention to provide means which will enable the individual person to be checked to make a check on his own and to learn the respective indication of the counting device representing the number of his work hours.

This problem has been solved with the checking device of the above-mentioned type by arranging the counting mechanism in conformity with the present invention in the immediate vicinity of the pertaining switch so that the counting mechanism can be read directly by the person actuating the switch. In view of the fact that the person to be checked will at any time be able to read the indication on the counting mechanism, which means to know how many of the work hours required for a certain pay period he has already put in, there is obtained the advantageous possibility to distribute the remaining work hours for said certain pay period in a manner most suitable for said person. This is an important condition for the control of a freely selectable work day. No special way of calculation is required for evaluating and calculating the total number of working hours registered by the checking device. It will rather suffice to read the respective indication of the counting device which can be done centrally in the heretofore known manner.

With heretofore known checking devices it was customary to provide the same at the respective entrance to the office or factory. For the purpose of associating the individual actuating devices with the respective person to be checked, heretofore the respective person had always to use a certain entrance of his office or factory provided for checking this person. Therefore, according to a further development of the present invention, it is suggested that those elements or devices which are accessible to the registering person, namely at least the switch and the counting mechanism, are combined in groups to control units and that such unit each is arranged in the vicinity of the working place of the individual person, i.e., in a decentralized location.

Most offices and factories have regulations providing for a fixed time for the start and end of breaks which can be taken during the working hours as provided by law. Since these breaks must not be counted as working time for a pay period, it is provided in conformity with a further development of the invention that an adjustable timer controls the counting action according to a preset program and, more specifically, turns off the counting mechanism during the fixed work breaks.

Referring now to the drawings in detail and FIG. 1 thereof in particular, the checking device illustrated in FIG. 1 comprises for each person of the respective organization to be checked an electric switch 1A, 1B, 1C, etc. Each of said switches is operable only by a safety key belonging to the respective person to be checked. More specifically, the switch 1A can be actuated only by the key 2A, the switch 1B can be actuated only by the key 2B, etc.

Each of the individual switches has furthermore associated therewith a separate counting device 4 which in the present embodiment happens to be designed as an impulse counter and cooperates with an impulse emitter 5 which latter emits, for instance 100 impulses per hour. However, instead of the impulse counter also other counting devices of standard design for counting the work hours may be employed.

When the person A to be checked closes the switch by means of his key 2A, the impulses emitted by the impulse emitter 5 are fed to the impulse counter until the person again opens the switch 1A by means of his key. This is done at the end of the time during which he has to be present in the plant

or the like so that the impulse counter will record the actual presence of the respective person and this time can be read at the end of a pay period, for instance, a week or a month. However, when the switch 1A is not opened when the person leaves the plant, the counting device 4 will for the said person continue to run and will then indicate an incorrect "present" time.

In order to prevent such misuse of the checking device, the invention provides that between each of the switches 1A, 1B, 1C, etc., and the pertaining counting device 4 there is arranged a blocking device 20 each. These blocking devices 20 are connected with the respective switches and counting devices in such a way that by means of the blocking devices also when the switch is closed, the feeding of counting impulses to the counting devices can be prevented as soon as the blocking device is actuated. With the particular embodiment illustrated in FIG. 1, the blocking device comprises a polarized relay 21 with a switch bridge 22 which in one stabile operative condition of the relay establishes connection of the counting device 4 with the switch 1A of the person A to be checked, and in the other stabile switch condition interrupts this circuit and then in lieu thereof turns on a signalling lamp 30. In order to be able to move the relay 21 from its illustrated switched-on position to the switched-off position and in this connection to make the blocking device 20 effective, the coil of relay 21 is connected to a terminal of switch 1A.

At certain times, primarily during the night, the persons to be checked are either not in the plant or do not have to be in the plant. Therefore, at this time all counting devices for the persons to be checked must be turned off. It is during this time of complete rest of the plant that preferably a control point, for instance midnight, is set. With the illustrated embodiment there is to this effect provided a timer 24 which at this set control point by means of a rectifier 25 emits a setting impulse upon that blocking device, the pertaining switch 1A, 1B, 1C etc., of which is in an undue manner still in its closing position. To this effect the rectifier 25 is provided between the impulse emitter 5 and the conductor 28 interconnecting the individual switches 1. When the timer emits a setting impulse, the switch bridge 22 of the respective blocking device is lifted off and thereby interrupts the connection to the counting mechanism 4. With all other counting units which are properly turned off, this setting impulse will have no effect.

The polarized relay 21 is secured against outer manipulation so that it cannot be reset or returned to the original switch condition by the person to be checked.

In order to make sure that the registering or counting device which in this way is put out of operation cannot again be set into operation during the next start of the work day of the person to be checked, the stabile switching-off of the blocking device 20 has to be neutralized by an outer manipulation and has to be returned to its original condition. To this end, with the illustrated embodiment, there is provided a switch contact 26 by means of which from the network power supply component or powerpack 8 serving for feeding the impulse emitter 5 a resetting impulse may be sent directly to the polarized relay, if desired, with the aid of a rectifier 27. This switch contact 26 is arranged at a central place or a control station which is not accessible to the persons to be checked, as for instance the accounting department. The return switch may be additionally blocked against unauthorized manipulations, for instance, by means of a safety lock. At any rate, it is important for the arrangement according to the invention that the person to be checked has no possibility to render the blocking device 20 ineffective which was actuated due to the fact that the switch pertaining to the person to be checked was permitted in an undue manner to remain closed. In order to make the blocking device ineffective, the respective person will therefore have to contact the control or supervising department.

As blocking device there may also be employed a non-polarized relay or an electronic control system, for instance, a bistable transistor sweep circuit or an electric melting fuse. Such melting fuse may in a simple manner be burned through by the setting impulse. It is also possible to employ a thermal switch-off mechanism actuated by an overvoltage impulse which switch can then be returned by hand to its starting position.

The checking device according to FIG. 2 comprises a number of control units corresponding to the number of persons to be checked. These control units are combined to groups on individual indicating or control boards 10 and may be arranged in the vicinity of the place where the respective person works. More specifically, each control unit comprises a key switch 1 having a receiving opening into which a safety key 2 may be inserted. The person to be checked keeps the key and when entering the plant inserts the key into the switch 1 and by turning the key moves the switch to its switched-on position. In this switched-on position the switch 1 establishes connection between a counting mechanism 4 arranged in the immediate vicinity of switch 1 and a current supply source 5 which similar to the impulse emitter 5 of the embodiment of FIG. 1 emits 100 impulses per hour. As soon as switch 1 has been placed into its switched-on position and then has registered the presence of the person to be checked by placing the counting mechanism into operation, the person to be checked may withdraw the key. According to the embodiment of FIG. 2 it is required that by means of the switch 1 there is turned off an absence control lamp 3 which previously lighted up as soon as the counting mechanism had started its operation. On the counting mechanism 4, under the influence of each impulse emitted by the emitter 5 a nonillustrated indicating device is advanced by one one-hundredth unit. The counting mechanism in contrast to heretofore known control devices has no daily return position but continues to move beyond the number of days pertaining to a pay period. In this way it is possible that each of the persons to be checked is able at the pertaining counting or registering unit to read the number of work hours completed up to said point when the person actuates the switch. This will afford the possibility of ascertaining the further necessary working hours for a pay period and to distribute these hours in a desired manner over the next days.

According to the embodiment of FIG. 2, for each person to be checked there is provided an individual channel on a multichannel tape recorder 7. This tape recorder 7 is driven continuously. The individual channels 6 of the tape recorder 7 respectively register the condition of the switch of one of the key switches 1.

With the illustrated embodiment it is provided that the voltage required for the operation of the checking device may be supplied by a network power supply componer or powerpack 18. This network power supply componer or powerpack 18 may precede a time clock or timer 9 which controls the checking in conformity with a predetermined program. This is of primary importance when the work breaks as provided by the work contract are not to be recorded by the counting mechanism. In this instance the counting mechanism 4 may by means of the timer 9 be held in off position during these work-breaks.

The individual checking units comprising a switch 1, a lamp 3 and a counting mechanism 4 may be provided several times for each individual person. These control units may, for instance, be located in the respective departments of the plant, in a central control station or at the entrance to the plant. It is of particular advantage to provide additional lamps 11 in parallel arrangement with regard to the connections of the tape recorder channels 6. These lamps will light up when the person to be checked is present and are built into an organization diagram 12 which, for instance, informs the telephone exchange about the presence of a person to be checked.

Instead of the safety keys 2 also coded identification cards or personal codes in cooperation with suitable electric matrices may be employed as switches. It is also possible instead of the impulse counter 4 and the impulse emitter 5 to provide other devices which will check the duration of operation, for instance a known counter for counting the hours of operation.

Similar to the embodiment of FIG. 1, for each counting device associated with an individual person there is provided one blocking deice 20 which, for instance, by means of a timer 24 is put into operation and then in the manner described above is after having been checked by a supervising person again reset by means of a switch 26.

The embodiment of FIG. 3 represents a further development of the embodiment of FIG. 1. It has been found expedient to record the total working time registered by the checking device for a person to be checked in such a way that at least a part of the total working hours can be associated with individual working operations. To this end, the counter 4 registering the total working time has associated therewith a plurality of auxiliary counters 41, 42 and 43 which may be turned on by nonillustrated control devices and which then will register the time pertaining to the individual working operations. These auxiliary counters 41–43 are provided with a resetting key 46 and accordingly may, if desired, be reset to a starting value. Moreover, the main counting device 4 has associated therewith an auxiliary counting device 44 which may likewise have a resetting key and is adapted, for instance, to register the respective working hours beyond a certain pay period.

According to a particularly advantageous arrangement of FIG. 3, there is provided an auxiliary counting device 40 which forms an impulse counter and may be of any design corresponding to the design of the main counting device 4, but is fed by an impulse emitter 50. The impulse emitter 50 has a variable impulse number $k \times n$ in contrast to the impulse emitter 5' which feeds the main counting device 4 and is adjusted for a definite number of impulses per time unit, for instance 100 impulses per hour. The impulse emitter 50 may be fed from the same network power supply component or part 8' as the impulse emitter 5' if the switch 51 located in its supply circuit is held in closed position during the time period involved in the working operation of interest. In this instance it will be possible without difficulties so to select the impulse number $k \times n$ to be emitted per time unit that k represents a cost factor for said time unit and that the indication on the counting mechanism directly indicates an amount of money.

It is, of course, to be understood that the present invention is, by no means, limited to the particular showing in the drawings but also comprises any modifications within the scope of the appended claims.

What I claim is:

1. A control device for checking the time during which persons belonging to an office or factory are present for work, which comprises: a plurality of personnel control units which corresponds in number to the number of persons whose presence is to be checked and which are respectively allotted to said persons, each of said personnel control units including a control switch adapted by the respective person whose presence is to be checked to be switched-on and switched-off at the start and at the end respectively of the respective person's working time, each of said personnel control units also including counting means respectively associated with said control switch of the respective unit for registering the time during which the pertaining control switch is turned on, each personnel control unit also including electrically controllable blocking means operatively connected to the pertaining control switch and counting means and operable in response to the failure of the person whose presence is to be checked to switch-off the pertaining control switch at the end of his working period to preclude and block next working period resetting of the respective control switch by the respective person.

2. A device according to claim 1, in which said blocking means is controllable by electric impulses.

3. A device according to claim 1, in which said blocking means includes electric circuit means comprising said counting means and also comprising circuit breaker means.

4. A device according to claim 3, in which said blocking means includes relay means.

5. A device according to claim 4, in which said blocking means includes polarized relay means.

6. A device according to claim 3, in which said blocking means includes electronic control means.

7. A device according to claim 3, in which said blocking means includes bistable transistor sweep circuit means.

8. A device according to claim 3, in which said blocking means includes electric fuse means.

9. A device according to claim 3, in which said blocking means includes thermal switch means.

10. A device according to claim 1, which includes timer means electrically connected to said blocking means and operable at desired times to emit control impulses to said blocking means for actuating the same.

11. A device according to claim 1, which includes manually operable resetting means for resetting said blocking means to its inactive position.

12. A device according to claim 11, in which said resetting means includes a key feeler.

13. A device according to claim 1, in which said counting means is arranged in the immediate vicinity of said control switch means to permit the direct reading of said counting means by the person actuating the pertaining switch means.

14. A device according to claim 1, which includes impulse emitter means, and in which said counting means includes impulse counting means for counting the impulses emitted by said impulse emitter means.

15. A device according to claim 1, in which said control switch means are respectively operable by different safety key means.

16. A device according to claim 1, in which said control switch means are respectively operable by differently coded identity card means.

17. A device according to claim 1, which includes adjustable timer means adapted to be set for controlling said counting means so as to turn the same off during work breaks.

18. A device according to claim 1, in which said control units are respectively arranged near the working place of the persons whose presence is to be checked.

19. A device according to claim 1, which includes tape recorder means having a plurality of channels corresponding to the number of persons whose presence is to be checked and respectively operatively connected to said control units.

20. A device according to claim 1, which includes a plurality of optically visible means respectively associated with said control units and indicating the organization plan of the office or factory of the persons whose presence is to be checked.

21. A device according to claim 1, which includes auxiliary counters respectively associated with said counting means and operable selectively to be made effective and ineffective.

22. A device according to claim 21, in which said auxiliary counters are impulse counters, and which includes impulse emitters for feeding impulses to said auxiliary counters, the impulse number $k \times n$ of said impulse emitters being variable and being expressed by $k \times n$ in which k represents a cost factor with regard to a time unit.

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