

Sept. 4, 1962

R. H. DAMON
REMOVABLE COUNTER

3,052,403

Filed Oct. 29, 1956

2 Sheets-Sheet 1

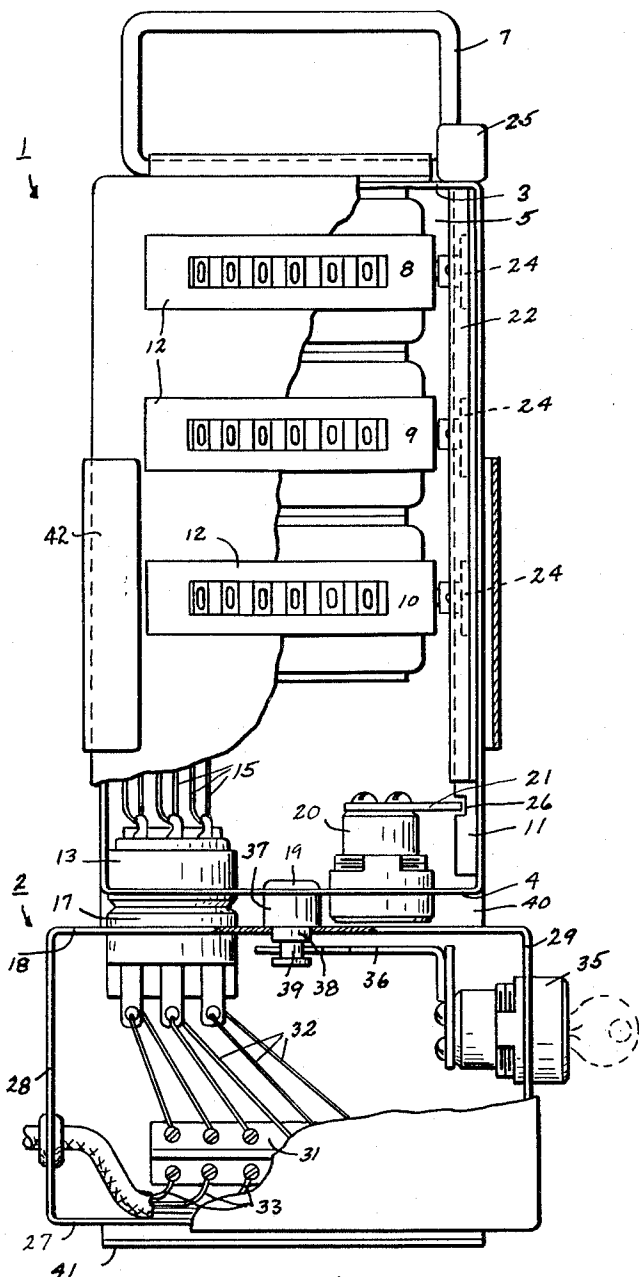


Fig.-1

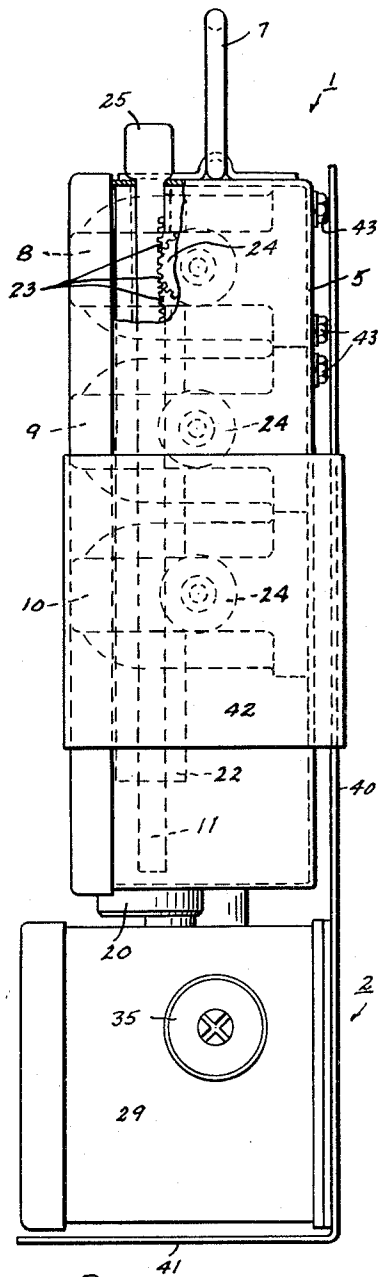


Fig.-2

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2 Sheets-Sheet 2

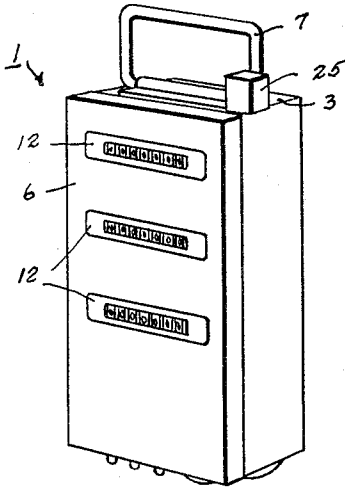


Fig. 5

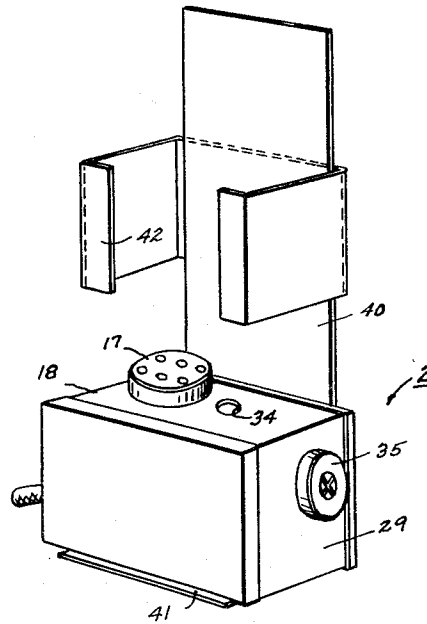


Fig. 6

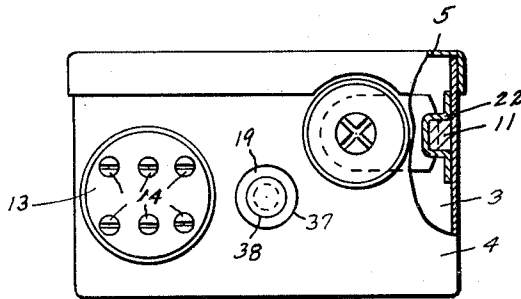


Fig. 4

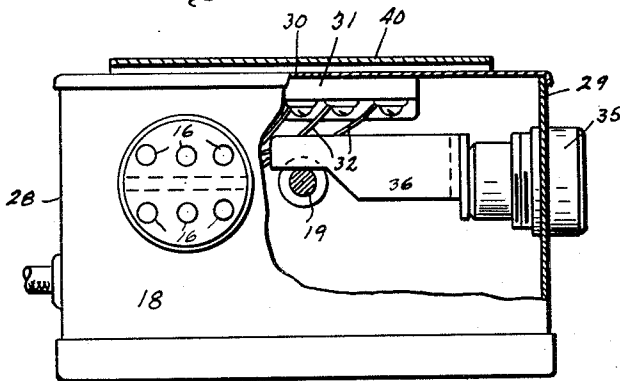


Fig. 3

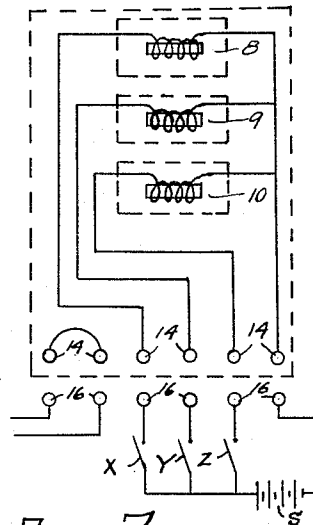


Fig. 7

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3,052,403

REMOVABLE COUNTER

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The invention relates generally to registers used in the transaction of business and more particularly is directed to apparatus utilized in conjunction with the auditing or collection of revenue and in the counting of machine or tool movements in the performance of manufacturing operations.

The apparatus embodying the invention may be employed wherever applicable but offers important advantages with respect to the registering of values, as in the collection of transit fares and theatre admissions. The majority of machines for this purpose are usually permanently installed adjacent a ticket window and include a register of a non-resettable type which requires the transcription of both opening and closing readings. This conventional setup has not proven entirely satisfactory because of errors in transcription or by way of surreptitious manipulation in that personnel may purposely understate closing readings to gain the unlawful use of funds until such time as they can make replacement. If the revenue is removed from a self-locking container, errors in transcription result in failure of reconciliation, necessitating costly re-checking and, in some instances, a complete breakdown of the audit system occurs.

The subject invention contemplates overcoming the above and other disadvantages inherent in conventional machines by utilizing one or more banks of registering units or apparatus in a compact transport case or rack, the units being so constructed as to be selectively detachably mountable in conjunction with revenue receiving or auditing machines located at different stations so that the units can readily be taken in for audit to a central accounting office away from the place of inception of the audit and other units immediately installed, in order to promote continuity of operations. In other words, personnel responsible for the pickup of collections, at remote locations or stations, will also remove registering units representing registrations compatible with the funds collected and submit both to an accounting office for reconciliation. Thus, the fundamental concept of providing removable registers is in reading them at a central office which reduces the transcription function and affords a setup for control of the activities of certain operations at various remote stations, which would otherwise be impossible to obtain except through transcription and relay of receipts taken at the stations.

When registers, for example, are used in conjunction with manufacturing equipment, the shifts in plants doing piece work can be automatically controlled by placing a register in a bin where the pieces are or sent to a central production control office where formerly someone had to come around and transcribe the figures and then transmit them to a central office.

With the foregoing in mind, the registers or apparatus embodying the invention, affords a setup whereby the need for special transcription technique mechanisms or paper forms, the calculation of difference between opening and closing readings in the conventional machines, and errors in transcription are eliminated. The apparatus further provides for the availability of accurate records for additional processing for transmission to other headquarters, and the bringing of the original source record from various stations to a point of audit without interruption of the machine function and permit the ready check of shifts or different operators of different machines or functions to be tabulated.

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In addition to the foregoing, and emphasizing with greater particularity, the structural characteristics embodied in the registering apparatus, an important object of the invention is to provide apparatus comprising a pair of housings or casings which are detachably connected together in a unique manner.

More specifically in this regard, one of the housings, which may be referred to as an upper or first housing, is preferably provided with one or more registering devices or counters disposed or sealed therein against tampering. This housing is also preferably provided with a connector having electrical contact means and conductors connecting the counters with the contact means; a manual control for resetting the counters; a lock; an actuator operated by the lock for locking the control against unauthorized manipulation; and a fitting cooperable with an actuator mounted in the other housing.

The other housing, which may be referred to as a lower or second housing, base or supporting means, is preferably provided with electrical junction block means disposed or sealed therein against tampering; a connector having contact means cooperable with the contact means carried by the upper housing; conductors connecting the junction block means with the contact means in the lower housing; means for receiving the fitting on the upper housing; a lock; an actuator or element operated by the lock for engaging the fitting for detachably locking the housings together; and bracket means for facilitating attachment of the upper housing to the lower housing.

A significant object of the invention is to provide an organization of components whereby the lock on the upper housing cannot be manipulated until after the housings are separated by unlocking the lock on the lower housing or base. In other words, access to the lock on the upper housing to permit manipulation of the manual control for the counters can only be obtained when the housings are separated or moved apart a sufficient distance to permit access to this lock, and such separation or movement can only be effected when the lock on the lower housing is unlocked. With this arrangement, after the apparatus has been operated for a desired period of time, the upper housing containing the counters can be readily detached from the lower housing and carried to a central accounting office where the readings on the counters are tabulated, after which the lock on the upper housing is unlocked to permit manipulation of the control to reset all of the counters, for example, to zero. This lock is then relocked to prevent actuation of the control, and the upper housing is again ready for redelivery to a station when required.

A specific object of the invention is to provide the lower housing with means which, among other things, serves to facilitate guiding the upper housing into connecting relation with the lower housing, stabilize the connection therebetween, and protect and prevent removal of fasteners holding at least certain of the counters in place.

Another important object of the invention is to provide a setup whereby access to the connectors and/or contact means respectively carried thereby is dependent on separation of the housings or movement thereof a sufficient distance apart to effect such access.

A specific object of the invention is to provide improved manual control means for resetting the counters or registers.

A further object of the invention is to provide an arrangement whereby the fitting and the connectors jointly serve to space and support the upper housing on the lower housing or base.

Also, an object is to provide a unique electrical hookup or system for use with the register.

Additional attributes of the invention reside in providing apparatus which offers advantages with respect to

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manufacture and assembly, durability, efficiency in operation and low cost of maintenance as compared to conventional apparatus now in commercial use.

Other objects and advantages of the invention will become apparent after the description hereafter set forth is considered in conjunction with the drawings annexed hereto.

In the drawings:

FIGURE 1 is a front elevational view of the assembled apparatus embodying the invention, with portions removed to illustrate certain details of the structure;

FIGURE 2 is a side elevational view of the assembly depicted in FIGURE 1, with portions removed to exemplify details;

FIGURE 3 is a top view of the lower housing with portions removed to illustrate the character of an actuator operated by the lock carried by this housing and manner in which the actuator cooperates with the fitting carried by the upper housing;

FIGURE 4 is a bottom view of the upper housing showing the relative positions of the connector contact means, fitting and lock carried thereby, and with portions removed to show certain details of the manual control;

FIGURE 5 is a perspective view of the upper housing;

FIGURE 6 is a perspective view of the lower housing or base of the apparatus; and

FIGURE 7 is diagrammatic view of an electrical hookup or system embodying the register.

Referring generally to the structure exemplified in the drawings, numeral 1 designates an upper housing and 2 a base or lower housing.

The upper housing may be designed and constructed as desired, but is preferably made in the form of an upright rectangular box having a top wall 3, a bottom wall 4, a back wall 5, a front wall 6, and side walls. A bail-like handle 7 is pivotally mounted on the top wall 3 of the housing for convenience in transporting the housing and for manipulating the housing with respect to the lower housing.

The upper housing may be provided with any form or type of responsive means, such as one or more registers or counters of any desirable character, mechanical or electrical, but as illustrated in FIGURE 1, the housing contains three counters, 8, 9 and 10, of the electrically actuated type which can be manually reset to zero, for example, by a manual control 11, carried by the housing. The counters are suitably mounted and preferably vertically arranged so that they can be read through sight openings or windows 12 provided in the front wall 6 of the housing.

A connector 13, preferably having insulated plug contact means 14, is carried by the bottom wall 4 of the upper housing and conductors 15 connect the contact means and the counters. The plug contact means 14 is adapted to respectively cooperate with insulated socket contact means 16 of a connector 17 carried by a top wall 18 of the lower housing 2. Obviously, the positions of the connectors may be reversed.

The bottom wall 4 of the upper housing is provided with a fitting or entering part 19 preferably extending therefrom and a lock 20 having a key entrance located between the housings. An actuator 21 operated by the lock is provided for locking the manual control 11 against manipulation.

Various means may be employed to reset the counters but as herein shown, the manual control 11 has proven satisfactory for this purpose. This control is preferably made in the form of a toothed rack reciprocally mounted for axial movement in the upper housing. More specifically in this regard, the rack is slidably mounted in a guide channel 22 secured to a side wall of the housing. Teeth 23 provided on the rack mesh with gears 24 respectively operatively connected to the counters as illustrated in FIGURES 1 and 2. The upper end of the rack extends upwardly through the top wall 3 of the upper housing and

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is provided with a manually engageable stop 25. The lower end of the rack is provided with abutment means preferably in the form of a notch 26, for cooperation with the actuator 21. After the stop is grasped to raise and/or lower the rack, the stop will predetermine the location of the notch for proper registration with the actuator when the latter is operated by the lock.

The lower housing 2, which may be considered a base or support, is also preferably box-like in shape and includes the top wall 18, above referred to, a bottom wall 27, side walls 28 and 29, a back wall 30, and a front wall. As clearly depicted in FIGURE 1, the top wall carries the connector 17 and socket contact means 16, above alluded to, and a junction block 31 is mounted and sealed in the housing with conductors 32 connecting terminals on the block with terminals extending from socket contact means 16. Other conductors 33 connected to the block are carried by a conduit which extends through the side wall 28 of the housing for electrical connection with a source of electricity and manual actuating means (not shown) so that movement of the latter will operate the counters or registers. For example, operation of one actuator may serve to register a certain value on the counter 8, while operation of other actuators will register different values on the counters 9 and 10.

More particularly in this respect and referring to FIGURE 7 of the drawing, there is shown an electrical system or hookup for operatively connecting the electrical components of the register with a source of electricity S and a plurality of switches X, Y and Z which are adapted for selective operation by the manual means above referred to which are not shown. The connectors 13 and 17 are so constructed that a pair of the plug contact means 14 cooperate with a pair of the socket contact means 16, to provide an electrical interlock in the power supply to the device being operated so that the device can not be operated when the counter is removed from the lower housing 2. Thus, when the upper housing 1 is mounted in operative relationship with the lower housing 2 to connect the contact means 14 and 16, a pair of each will serve to complete the operating circuits for the counters 8, 9 and 10 and when the upper housing is removed the operating circuits to both the counters and device being operated will be interrupted. Accordingly, the counters will be operative for registry purposes only when the upper and lower housings are operatively connected. The switches represent different values, so that when the switch X is actuated to represent receipt, for example, of an admission charge of one value, the counter 8 will register such value and in like manner the counters 9 and 10 will register different values in response to the actuation of switches Y and Z.

The top wall 18 of the lower housing is also provided with receiving means, preferably in the form of an opening 34 which is adapted to receive the fitting 19 on the upper housing. The side wall 29 of the lower housing is provided with a lock 35. An actuator 36 operated by the lock 35 affords a detachable locking connection with the fitting. The locks 20 and 35 preferably require different keys or combinations so that many different persons normally having access only to the lock 35 would not be able to operate the lock 20 under the control of an accounting officer.

More specifically in this respect, the fitting 19 carried by the upper housing may be constructed in various ways but, as depicted in FIGURES 1, 3 and 4, it comprises a one-piece body having a portion which extends through a hole in the bottom wall 4 and is upset inside the housing for permanent connection therewith. The body also includes a relatively large cylindrical portion 37 of a predetermined length substantially corresponding to the combined axial extents of the exposed portions of the connectors 13 and 17 located between the opposed walls 4 and 18 of the housings so that the housings will be maintained in predetermined spaced relationship and the exposed portion of the lock 20 in spaced relationship to the lower

housing as evidenced in FIGURE 1 of the drawing. In other words, the cylindrical portion 37 of the fitting finds support upon the top wall 18 of the lower housing and spaces the housings and the exposed portion of the connector 13 finds support on the exposed portion of the connector 17 for spacing purposes. Thus, the upper housing is preferably supported on the lower housing through the joint agency of the fitting and the connectors.

The body of the fitting 19 is further provided with a cylindrical portion 38 of a lesser diameter and axial extent than the cylindrical portion 37. This smaller cylindrical portion is adapted for entry through the opening 34 in the top wall 18 of the lower housing and is provided with a reduced cylindrical portion or neck 39 which is adapted for locking engagement with the actuator 36 for locking the housings together.

The lower housing is preferably provided with a bracket having an upstanding wall 40 which is secured to the back wall structure of the housing as shown in FIGURES 2 and 3. This bracket includes an offset forwardly extending horizontal portion 41 disposed in relatively close spaced parallel relationship to the bottom wall 27 of the lower housing to provide a rest or support for the apparatus. This bracket is also provided with a member 42, which in combination with the bracket, forms guide means within which the upper housing is disposed. Attention is directed to the fact that the axial extent of the member 42 and the length of the wall 41 of the bracket, are sufficient to impart stability to the upper housing so that the contact means and fitting on the upper housing will respectively properly axially cooperate with the contact means and receiving means provided on the lower housing. The bracket 40 and member 42 also serve to facilitate piloting the upper housing into connecting relationship with the lower housing and maintain the housings aligned so that the plug contact means 14 and the fitting will not be damaged when the upper housing is being detached from the lower housing. The upper extremity of the upstanding wall 40 extending above the member 42 also assists in directing or piloting the lower end of the upper housing into the ring and also protects fasteners, such as 43 holding certain of the counters in place.

In view of the foregoing, it will be manifest that when the time arrives for the removal of the upper housing for transport to an accounting office, it is merely necessary to operate the lock 35 on the lower housing so that the actuator 36 will be released from the neck 39 of the fitting 19 on the upper housing, whereupon the latter can be pulled upwardly by the handle 7 to separate the contact means 14 and 16 and the fitting 19 from the receiving means 34. The upper housing is then taken to the accounting office where the figures registered by the counters are recorded, after which the lock 20 on the upper housing is operated to release the actuator 21 from the notch 26 in the manual control 11, whereupon the control can be pulled outwardly and then pushed inwardly to reset the counters to zero. The lock 20 is then operated so that the actuator 21 will reengage the notch to prevent unauthorized manipulation of the control, which places the upper housing in condition for redelivery and operative connection with any one of a number of corresponding lower housings by manipulating the lock 35.

Having thus described my invention, it is obvious that various modifications may be made in the same without departing from the spirit of the invention, and, therefore, I do not wish to be understood as limiting myself to the exact form, construction, arrangement, and combination of parts herein shown and described.

I claim:

1. A support, a connector mounted on the support and female electrical contact means carried by the connector, a first actuator and a first lock for operating the actuator carried by the support; a housing associated with the support and having a connector thereon provided with male electrical control means adapted to cooperate with said female contact means, a number of counters mounted within said housing and operatively connected to said male contact means, a manual control means for resetting the counters, a second actuator and a second lock associated with the control means for securing said control means in a non-operative condition, a fitting mounted on the housing and disposed for locking engagement with the first actuator to lock the support and housing together and thereby prevent access to said contact means and said second lock.

2. A first housing provided with a number of counters disposed therein, a first electrical control means for said counters, a manual controlled actuator adapted to reset the counters disposed in the first housing and having one end extending through the top wall of the first housing, said actuator having a notch at the other end, a first lock mounted on the first housing and having a member for engaging the notch on the actuator, said first housing having a fitting mounted on the bottom wall, a second housing provided with an opening for receiving said fitting, a second electrical control means cooperable with the first control means for said counters, and a second lock for locking the fitting in the opening to hold the first housing and second housing assembled, said electrical control means and first lock being disposed between the first housing and second housing so that they are inaccessible when the housings are assembled.

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