United States Patent

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[54] **METHOD AND APPARATUS FOR DISTRIBUTING DRUGS AND THE LIKE**
3 Claims, 4 Drawing Figs.

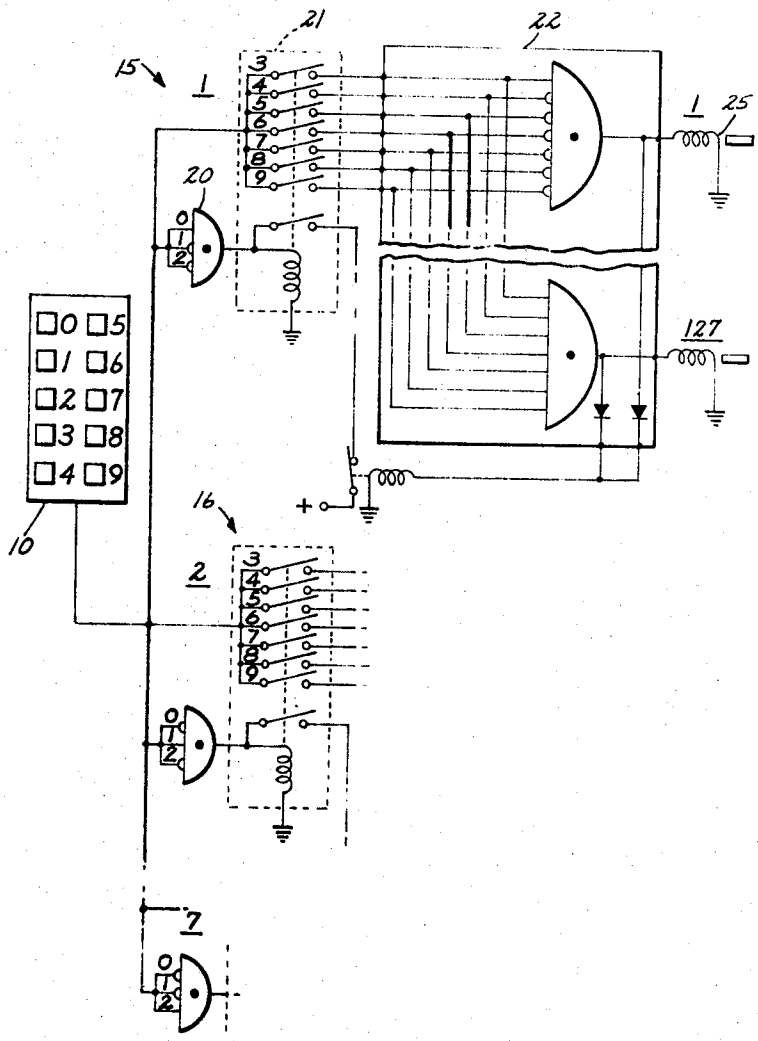
[52] **U.S. Cl.** ..... **340/147 R,** 340/147 MD
[51] **Int. Cl.** **H03k 13/00,** H04q 9/00
[50] **Field of Search** ..... 340/147 MD, 147, 153, 152; 179/2 DP

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ABSTRACT: Command means located at a central pharmacy, including a touch-tone or rotary dial phone or some other signal transmitting device, operatively connected to a plurality of remotely positioned dispensing stations, such as cabinets located at patients' bedsides or at centrally located nursing stations, the remote dispensing stations each containing a plurality of drugs or the like and including dispensing means and signal accepting means, such as commercially available decoders, for accepting and identifying signals from the command means to dispense the correct drug at the correct station upon the receipt of a signal therefor.



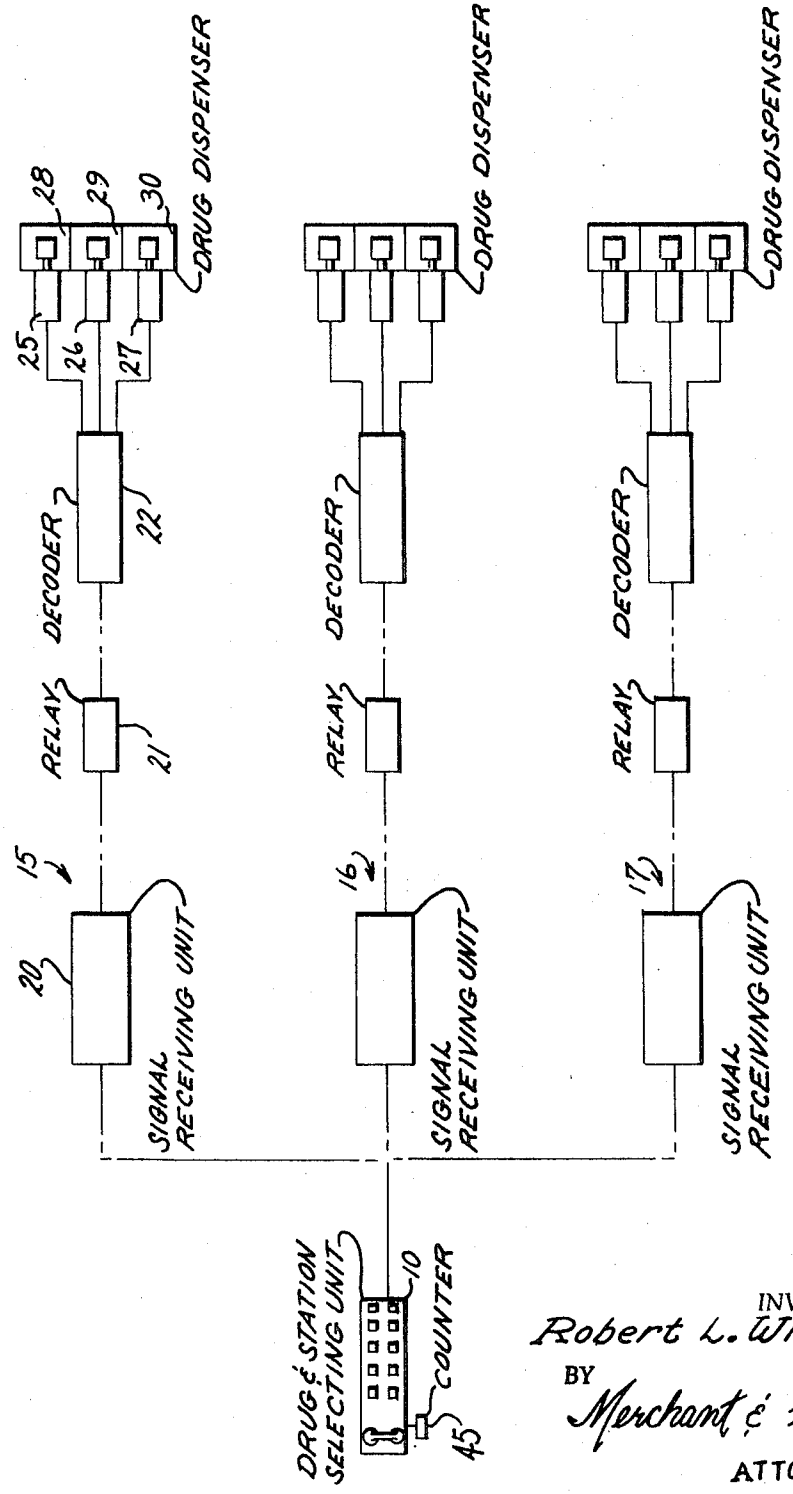


FIG. 1

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FIG. 2

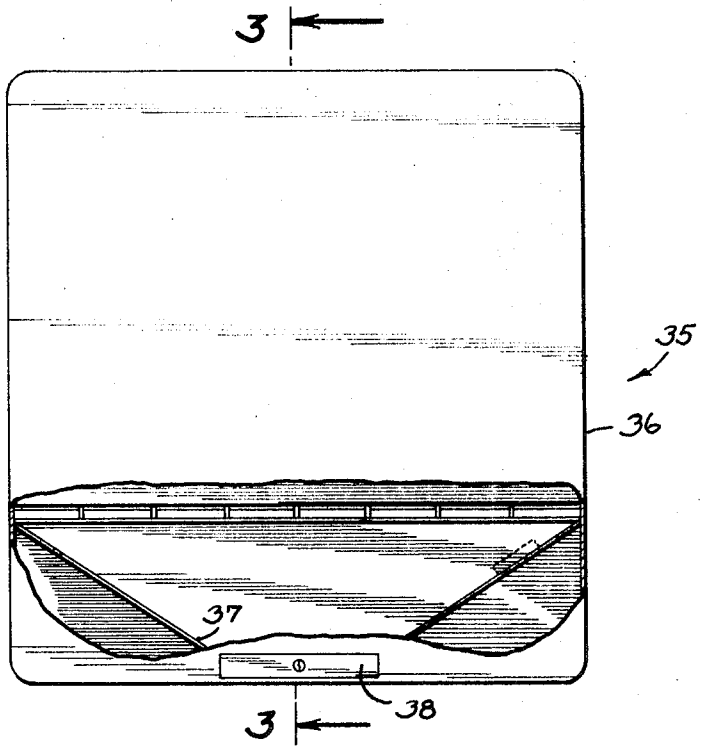
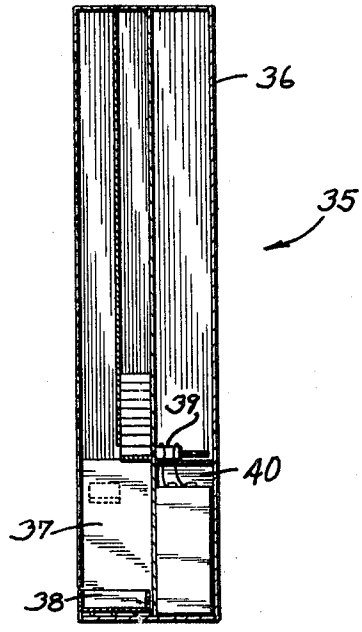


FIG. 3



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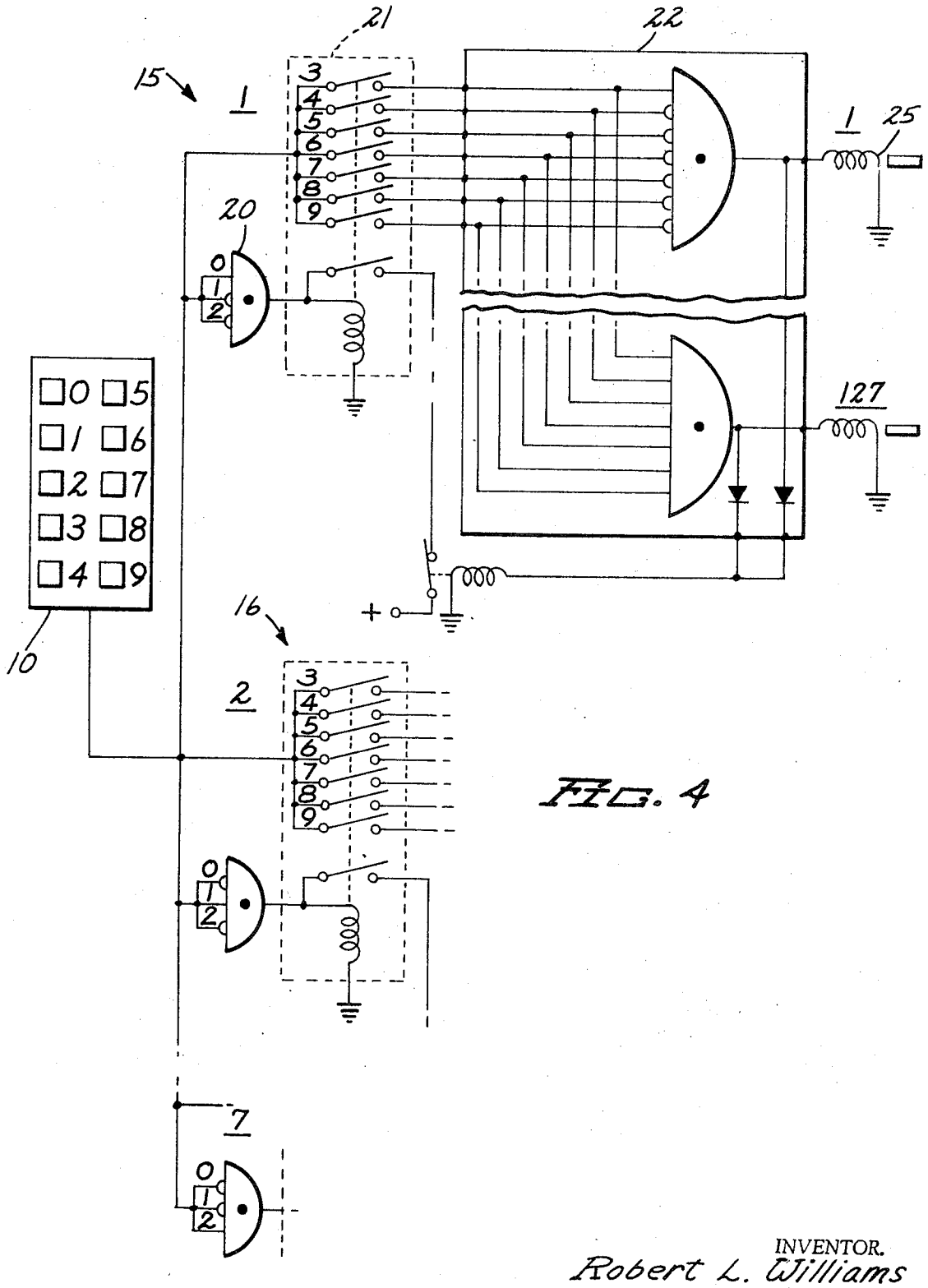


FIG. 4

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METHOD AND APPARATUS FOR DISTRIBUTING DRUGS AND THE LIKE

BACKGROUND OF THE INVENTION

Field of the Invention

Because of the peculiar effects and dangers inherent in many drugs and medicines it is the present practice to allow only registered pharmacists to dispense drugs upon receipt of a written or verbal message directly from an authorized physician. This requirement greatly hampers the effectiveness of nurses, etc., operating in hospitals, clinics, and the like, since they must in each instance travel to a central area having a registered pharmacist, to obtain drugs and the like to administer to their patients. While the chances that the drugs or other medicines will fall into the wrong hands are substantially eliminated, isolated cases have occurred and the efficiency of the nurses is greatly hampered.

SUMMARY OF THE INVENTION

The present invention pertains to a method and apparatus for remotely distributing drugs and the like including command means operable by a pharmacist upon receipt of a prescription from an authorized physician which supplies a first signal specifying and preparing a particular one of a plurality of distributing stations for a second signal supplied by the command means upon actuation by the pharmacist which second signal energizes dispensing means to dispense an individual dose of a selected drug or medicine from a supply thereof into a locked drawer or the like so that it is convenient for a nurse to administer.

It is an object of the present invention to provide a method and apparatus for remotely distributing drugs and the like from a central station.

It is a further object of the present invention to provide a method and apparatus for remotely distributing drugs and the like at a plurality of remote stations located at bedside or central nursing stations, from a central distributing station.

These and other objects of this invention will become apparent to those skilled in the art upon consideration of the accompanying specification, claims, and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring to the drawings, wherein like characters indicate like parts throughout the figures:

FIG. 1 is a block diagram of apparatus for remotely distributing drugs and the like;

FIG. 2 is a view in front elevation of a bedside-type dispensing station, portions thereof broken away and shown in section;

FIG. 3 is a sectional view as seen from the line 3–3 in FIG. 2; and

FIG. 4 is a semiblock diagram of the apparatus illustrated in FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. 1 the numeral **10** designates command means which is located at a central station or pharmacy. The command means may be any electronic or electrical unit capable of supplying signals that are variable in at least one characteristic, such as frequency, pulse repetition rate, etc., and may be for example a touch-tone or rotary dial phone. The command means **10** further may include any of a variety of locking means, combination or key type, to prevent the indiscriminate use thereof by other than the registered pharmacist.

Operatively attached to the command means **10**, by wires, electromagnetic waves, or the like are a plurality of remotely positioned dispensing stations generally designated **15**, **16** and **17**. The number of remote stations operatively attached to any one command means **10** is limited only by the number of combinations available in the command means **10** for varying the particular characteristic which is transmitted to the dispensing stations **15**, **16**, **17**, etc. The various dispensing stations, **15**, **16**, **17** may each be located at bedside in a hospital with the command means **10** located at a central nursing station for that portion of the hospital or for the entire hospital. Also, the remote dispensing stations **15**, **16**, **17** may each be located at a central drug or medicine dispensing station in separate hospitals or clinics with the command means **10** positioned at a centrally located pharmacy or the like. It is anticipated that the command means **10** can be connected to the dispensing stations **15**, **16**, **17** through the present telephone system or through a completely separate system if desired.

Each of the remotely positioned dispensing stations **15**, **16**, **17** are the same in this disclosure, although it is not necessary that each contain all of the components of the other stations, and, therefore, only the dispensing station **15** will be described in detail. The dispensing station **15** includes a signal receiving unit **20**, which may be a telephone or other unit equipped to receive the electrical or electromagnetic signals from the command means **10**. The signal receiving unit **20** controls a relay **21** and upon the receipt of a predetermined signal in the signal receiving unit **20** the relay **21** is closed so that a signal may pass from the signal receiving unit **20** to a decoder **22**. The signal receiving unit **20**, relay **21** and decoder **22** constitute signal accepting means, in this embodiment, which operate only upon receiving a first signal specifying the dispensing station **15**.

Unit **20** and decoder **22** may, for example, be formed by standard digital techniques, such as described in pages 547 to 552 of the book *Digital Computer and Control Engineering*, by Robert Steven Ledley, McGraw-Hill 1960. FIG. 4 illustrates this typical circuitry inserted in the block diagram of FIG. 1. Signals specifying other dispensing stations (**16**, **17**, etc.) will have no effect on the signal receiving unit **20**.

Once the command means **10** has been actuated to transmit a desired signal specifying one of the dispensing stations, for example **15**, and the signal has actuated the relay **21** through the signal receiving unit **20**, the command means **10** is actuated to transmit a signal specifying a particular one of a plurality of drugs and/or medicines or the like. The second signal transmitted by the command means **10** passes through the signal receiving unit **20** and the relay **21** to the decoder **22**. The decoder **22** is constructed to receive the second signal and actuate a specific one of a plurality of dispensing devices **25**, **26**, and **27**. It should be understood that the number of dispensing devices associated with any particular decoder, such as decoder **22**, is limited only by the number of combinations available in the particular code utilized and in general will be equal to the number of different drugs or medicines it is desired to dispense at any particular station, such as station **15**. In the present embodiment three dispensing devices **25**, **26**, and **27** are illustrated having three drug dispensers **28**, **29** and **30** associated therewith, respectively.

The drug dispensers **28**, **29** and **30** in this embodiment are simply racks constructed so that small containers, each having an individual dose of the desired drug or medicine therein, can be stacked in overlying relationship therein. The dispensing devices **25**, **26** and **27** associated therewith are solenoids having the armature situated so that the lower container in the stack of containers positioned in each of the drug dispensers **28**, **29** and **30** is pushed from the stack.

Referring to FIGS. **2** and **3** a typical bedside station generally designated **35** is illustrated. The bedside station **35** consists of a housing **36** having a trough **37** located in the lower forward portion thereof, which trough **37** empties into a drawer **38**. The drawer **38** may be locked so that only the nurse authorized to administer drugs at the particular station can gain access to the contents thereof. Mounted above the trough **37** are a plurality of parallel walls with stacks of containers each having an individual dose of drug or medicine therein stacked therebetween. A plurality of solenoids or other dispensing devices **39** (see FIG. 3) are mounted behind the stacks of containers and adjacent the lowermost container

so that energization of a solenoid **39** causes one of the containers to be pushed into the trough **37**. Below the solenoids **39** is a compartment **40** containing the signal receiving unit, relay and decoder, previously described. It should be understood that a relatively simple bedside station **35** is described herein to simplify the disclosure but many modifications and variations may be devised by those skilled in the art.

While FIGS. **2** and **3** illustrate a simple bedside station it should be understood that the present invention might be utilized to dispense drugs at various nursing stations, each serving as a central station for a complete floor or department of a hospital. In this application the dispensing station might have hundreds or even thousands of various drugs and medicines therein and each would be dispensed in a manner similar to that described above. It should also be understood that various types of dispensing stations such as central nursing stations and the bedside stations might all be controlled from a single command means.

The decoder **22** contains a timing means which is energized when the decoder **22** applies power to one of the dispensing devices **25, 26, 27**. The timing means is set to provide sufficient time for the dispensing device **25, 26, 27** to eject the drug or medicine from the drug dispensers **28, 29, 30** whereupon the particular dispensing device **25, 26, 27** that was energized is returned to its normal position, the decoder **22** is deactivated, and the signal receiving unit **20** and relay **21** are returned to the normal position. The timing device utilized in the decoder **22** can be a slow-release or time-delay relay (not shown) for each of the dispensing devices **25, 26, 27**, which relays are energized by the decoder **22** and supply power through the contacts thereof to the dispensing devices **25, 26, 27**. Other types of timing devices might be utilized but, in general, it should be understood that sufficient time must be allowed after the signal receiving unit **20** closes the relay **21** for the pharmacist to supply a second signal therethrough to the decoder **22** specifying the particular drug or medicine desired.

A counter **45** is attached to the command means **10** to maintain an accurate count of the number of units dispensed in the various stations by the command means **10**. The counter **45** may be actuated by means in the command means **10** which operate when the second signal or drug specifying signal is completed, or the counter **45** may be operated by a signal returned from the dispensing stations upon completing the operation of dispensing a drug or medicine. In general, it is preferred that the counter be actuated upon the completion of a dispensing operation since the counter **45** will then act as an indicator that the dispensing operation is complete. No particular apparatus or circuitry is illustrated for energizing the counter **45** since there are a variety of such means presently available on the market.

In the operation of the present apparatus the authorized physician transmits a prescription to a registered pharmacist, either by written or verbal message so that the pharmacist is aware of the physician's identity. The pharmacist then determines the code for the correct dispensing station and activates the command means **10** to transmit a specifying signal to the various dispensing stations. Upon receipt of the first signal at the dispensing stations the desired signal accepting means at that station activates the decoder and places the dispensing station in condition for receiving a second signal specifying the desired drug or medicine. After completing the transmission of the first signal the pharmacist determines the correct code for the desired drug or medicine and actuates the command means **10** to transmit a second signal specifying the desired drug or medicine. The second signal affects only the dispensing station previously activated by the first signal. Upon receipt of the second signal the decoder actuates the dispensing device to dispense the desired drug or medicine into the locked drawer in the housing associated with the dispensing station or dispensing device. The nurse may then, at her convenience or at the required time, open the drawer and administer the drug or medicine to the patient.

Thus, a method and apparatus for distributing drugs and the like is disclosed which is under the control of a registered pharmacist at all times so that drugs and the like can be dispensed only with the authorization thereof and only to the people who are authorized to receive the drugs or medicines. Further, the drugs and medicines contained within the apparatus are unobtainable by all persons until the pharmacist dispenses the desired drug or medicine. While the present embodiment has been illustrated in general terms, because the components therein are standard commercial items, it should be understood that many innovations and modifications may be designed and/or incorporated by those skilled in the art.

What I claim is:

1. A method of distributing drugs and the like comprising the steps of:

a. an authorized pharmacist receiving a prescription from an authorized physician;

b. said pharmacist actuating signal producing means to transmit a coded signal to a plurality of remotely located distributing stations, said coded signal placing a desired one of said remote stations in a ready mode for receiving a second coded signal;

c. said pharmacist actuating said signal producing means to transmit a second coded signal to said desired one of said remote stations to dispense the prescribed medicine from a storage container associated therewith; and

d. a nurse removing the medicine from the remote station and administering it to a patient.

2. A method of distributing drugs and the like as set forth in claim **1** including in addition the step of identifying the authorized physician after receiving the prescription and before actuating the signal producing means.

3. A method whereby a pharmacist or the like can remotely distribute drugs and the like comprising the steps of:

a. a pharmacist receiving a prescription and information as to which drug dispensing unit of a plurality of remotely located drug dispensing units, each having a storage container and a locked material receiving closure in communication with the storage container, is the desired unit;

b. providing a code designating each of the plurality of dispensing units and a variety of materials in each of the dispensing units;

c. selecting the code for the desired unit;

d. actuating a command station, operatively connected to the plurality of remotely located drug dispensing units, to transmit a coded signal in accordance with the determined code placing the desired one of said remote units in a ready mode for receiving a second coded signal;

e. selecting the code for the prescribed material;

f. actuating the command station to transmit a second coded signal in accordance with the determined code to the desired one of said remote units to dispense the prescribed material from the storage container associated therewith into the associated locked closure; and

g. unlocking the associated closure and removing the dispensed material.