

Oct. 24, 1944.

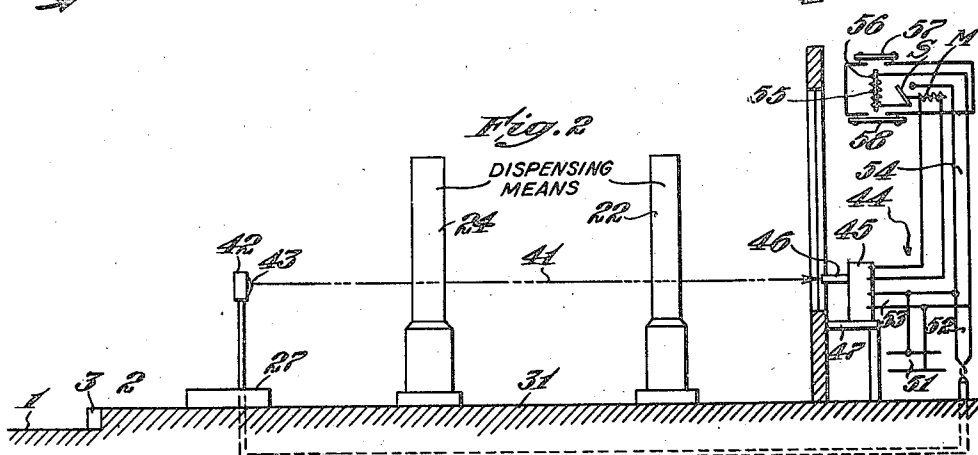
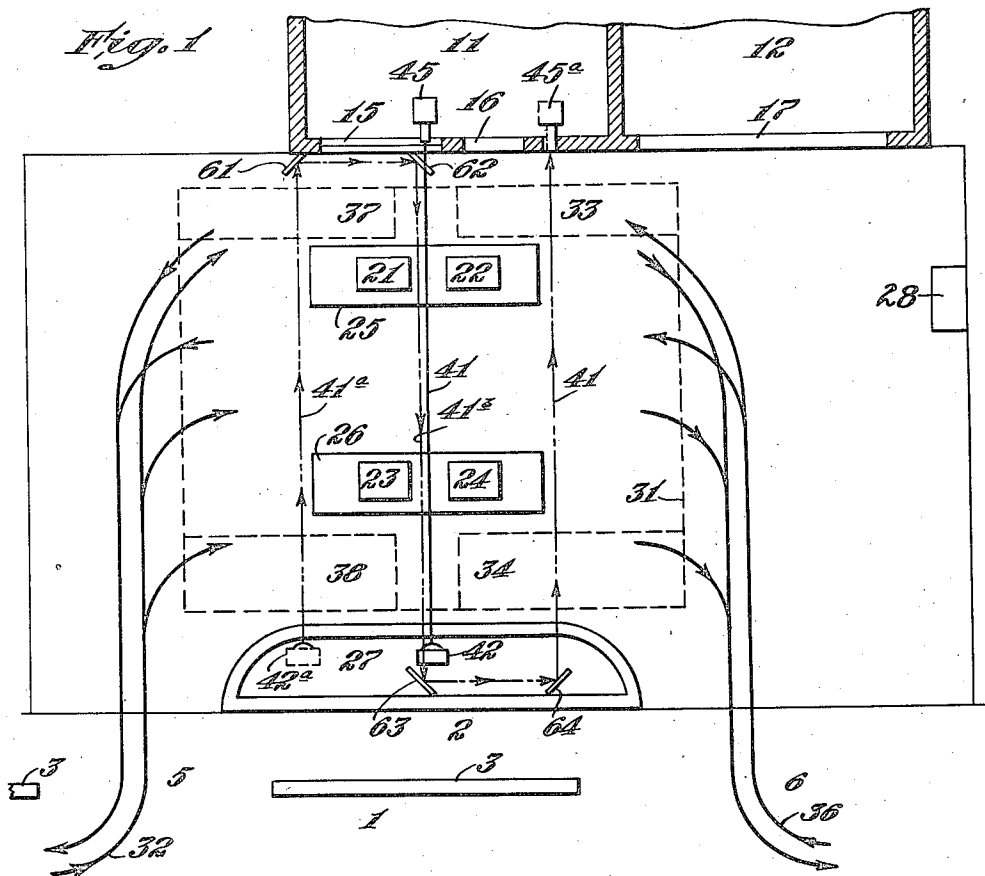
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2,360,885

PHOTOELECTRIC SUPERVISION OF FILLING STATIONS

Original Filed May 2, 1939

2 Sheets-Sheet 1



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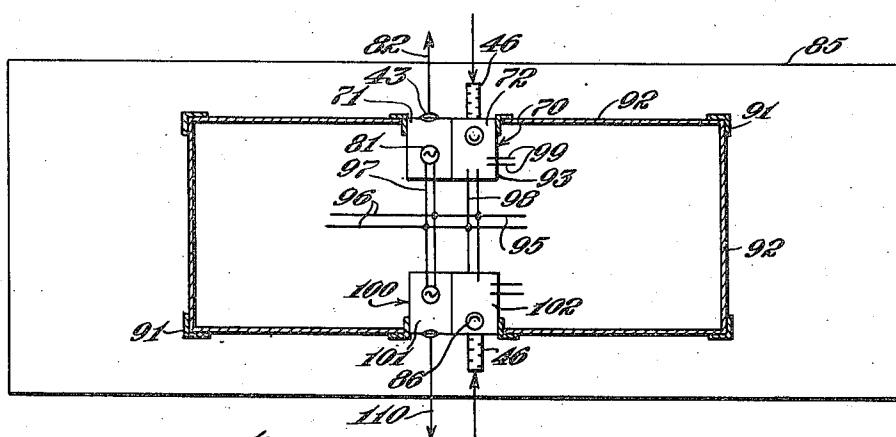
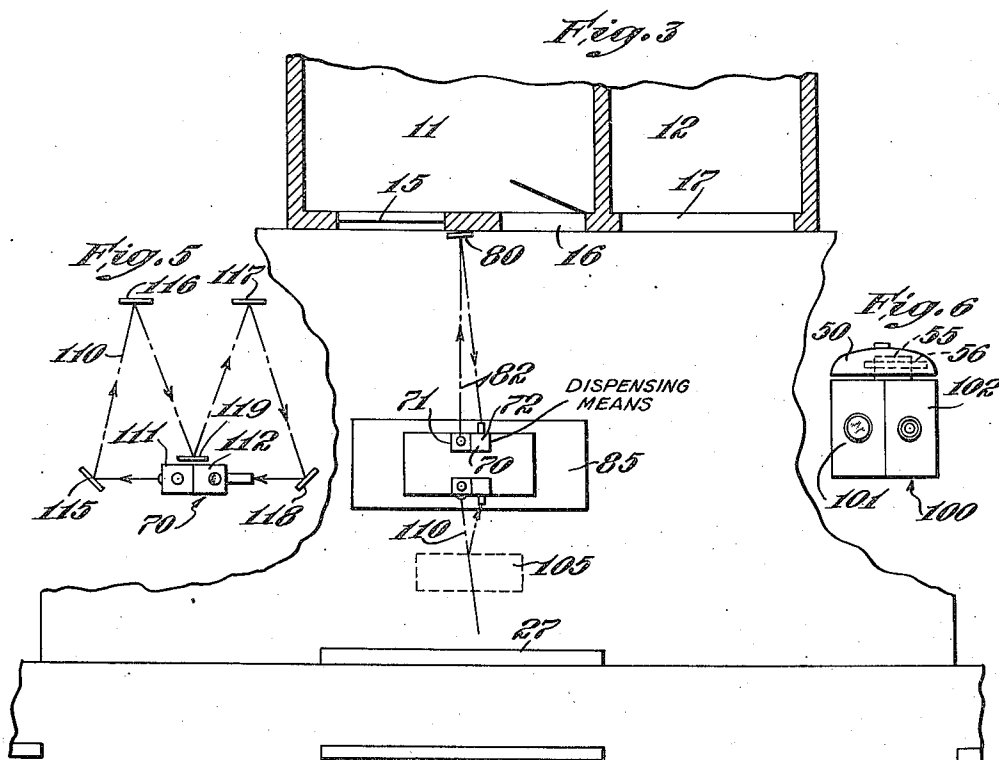


Fig. 4

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UNITED STATES PATENT OFFICE

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PHOTOELECTRIC SUPERVISION OF
FILLING STATIONS

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Original application May 2, 1939, Serial No.
271,323. Divided and this application Novem-
ber 11, 1942, Serial No. 465,268

4 Claims. (Cl. 177—311)

The present invention relates to signaling arrangements, and particularly to the supervision, with the aid of photo-electric devices, of installations for dispensing supply material to a temporarily present receptacle, the present application being a division of abandoned application Serial No. 271,323, filed May 2, 1939.

In installations of this type, for which the customary gasoline station is a good example, the attendant is in most instances unable to keep his eye at all times at the approaches and dispensing devices, being, for example, at work in his shop. On the other hand, it is necessary that he be not only advised of the approach of a customer to his station but also, at least roughly, concerning the nature and manner of approach of a receiving object, as for example the car with its tank.

The principal objects of the present invention are to provide a simple, inexpensive and rugged arrangement for indicating to a supply station attendant the approach and probable location and intention of a receiving device, and to provide photo-electric devices especially suitable for that and similar purposes.

These and other objects and aspects will be apparent from the following description of a typical embodiment of the invention, this description referring to drawings in which:

Figs. 1 and 3 are plans of gasoline stations incorporating signaling arrangements according to two respective embodiments of the invention;

Fig. 2 a cross-section on line 2—2 of Fig. 1;

Fig. 4 is a schematic horizontal section through the pump shown in Fig. 3; and

Figs. 5 and 6 are diagrams indicating modifications of Fig. 3.

In both embodiments chosen for illustrating the invention, 1 is a street, 2 a sidewalk and 3 the curb between street and sidewalk. Approaches 5 and 6 lead from the street to a gasoline station which may have an attendant's and sales room 11 and a lubrication hall and shop 12, with window 15 and doors 16 and 17. Gasoline pumps 21, 22 and 23, 24 are arranged on platforms 25 and 26, respectively, between the shops and an island 27 separating the station from sidewalk 2. Provisions not necessarily requiring the attendant's presence when used, as for example a compressed air outlet, may be arranged, for example, at 28.

The gasoline pumps no matter how arranged, will always determine an area 31 indicated in Fig. 1 in dotted lines and herein referred to as filling area. This area is defined by the spatial

arrangement of the pumps, the reach of the gasoline hose and to some extent by the size and gasoline tank arrangement of the cars to be supplied. It will be evident that cars approaching from 32 or 36 can assume extreme positions indicated at 33, 34, 37, 38, and that these or analogous extreme positions will define the outlines of the filling area which are not necessarily rectangular, as herein indicated, but whose configuration will depend upon the arrangement and construction of the gasoline pumps.

Crossing the filling area 31 is provided a light beam 41, for example by means of lantern 42 (Fig. 2) having a lens system 43 suitable to form a comparatively narrow beam. The beam normally impinges upon photoelectric device 44 which, for example, may be of the type described in Patent No. 2,154,480, of April 18, 1939, to Edward R. Toporeck, and have a housing 45 with light hood 46 according to my copending application Serial No. 222,889, filed August 3, 1938, Patent No. 2,242,317. As shown in Figs. 1 and 2, the photoelectric apparatus may be mounted inside window 15 on a table 47. Lamp 42 and receiver 44 are supplied with current from line 51, through leads 52 and 53, respectively. The relay magnet M of the receiver is brought out into the housing of a signal bell supplied through leads 54 and having a relay switch S operated by magnet M, a solenoid 55, a striker armature 56 and two gongs 57 and 58, respectively, preferably of different pitch. As described in the above patent, switch S may be retained open so long as beam 41 impinges upon the photocell of receiver 44, whereas it closes when the beam is interrupted. Accordingly, armature 56 will normally rest on plate 58, will strike and sound plate 57 when the beam is interrupted and hence switch S closed, and will be released and sound gong 58 when the beam is restored and switch S reopened.

If a car enters the filling area, it will interrupt beam 41 and gong 57 will sound, notifying the attendant that service is requested. Upon leaving and restoring the beam, gong 58, of different pitch, will sound, indicating that the car is leaving the station. If a car or a pedestrian merely passes, both strokes will sound, indicating to the attendant that his presence is unnecessary; in most instances it will even be possible to distinguish between vehicles and persons by way of the longer or shorter intervals between strokes. Cars not needing personal attention, as for example merely requiring air at

28, will stop outside the filling area without initiating any signal.

While it will often be sufficient to employ a single beam approximately covering the loading area, a preferred embodiment of the invention contemplates coverage of the loading area in such a manner that any car, no matter where it stops within that area, will with certainty keep the beam interrupted so long as it remains in that area. For that purpose, several beams or sections of a single beam are provided, as indicated in dot and dash lines in Fig. 1, where 42^a is a lantern similar to 42 but placed towards one end of island 27, throwing beam 41^a towards mirror 61 which reflects it laterally to mirror 62 deviating it as 41^b towards mirrors 63 and 64 which finally direct it as 41^c into receiver 45^a. In this or similar manner (for example by using several beams and receivers, or a single receiver with a zigzag or irregularly deviated beam, as indicated in Fig. 5, according to the layout of the filling station) the loading area is covered by beams at distances smaller than the dimensions of a car in the direction of these distances, in any possible position of the car. In this manner, the second signal stroke can only be sounded when the car leaves the loading area, so that the attendant can with certainty distinguish between merely passing and stopping cars.

It is further possible to cover the loading area with beams at a distance greater than the smallest obstructing dimension to be expected, but positioned in such a manner that a beam will be interrupted by a car at rest for fueling. In that case, an uneven number of strokes may sound before the car has stopped for fueling, whereas an even number of strokes will have sounded only after the car has left the loading area. In this manner, the attendant can again distinguish between passing and stopping cars.

Another embodiment of the invention is especially compact, easy to install and certain in operation; it will now be described with reference to Figs. 3 to 5.

These figures show a filling station similar to that of Figs. 1 and 2, but with only one pump, and marked accordingly. In these figures, 70 is a photoelectric unit combining lantern 71 and receiver 72 in a single housing. Lantern compartment 71 contains a lamp 81 and a suitable optical system 43 providing a light beam 82. Receiver compartment 72 has a hood 46 and contains, in addition to photoelectric cell 86, an amplifying circuit, as for example described in the above-mentioned patent.

The light beam is directed from lantern compartment 71 back to receiver compartment 72 by means of a mirror 80 mounted on house 11. Although unit 70 might be mounted at any suitable point, I prefer to combine it with the dispensing device, taking advantage of the fact that most dispensing devices of the type in question, as gasoline pumps, are wired for lights as well as motors. Therefore, if unit 70 is combined with, and preferably built into, the pump, an especially satisfactory construction results. This arrangement is shown in Fig. 4, where 91 is the framework of the pump housing, 92 the wall structure, and 93 the housing for unit 70 with compartments 71 and 72. The electric supply wires are indicated at 95; leads 96 supply the pump itself, wires 97 the lantern, and wires 98 the receiving circuit. The connections to magnet M of the signal device (Fig. 2) are indicated at 99.

The above described arrangements operate with normally illuminated photocells. As described in the above patent, circuits of this type are also suited to maintain a relay de-energized so long as the photocell is comparatively dark, becoming operative when the impinging light flux increases. This possibility is taken advantage of in the arrangement shown in Fig. 3 as supervising the street side portion of the filling area. Unit 100 (Fig. 4) has a lantern 101 and a receiver 102, the latter being arranged for response upon an increase of the illumination of the photocell. In this instance, the object to be supervised itself, for example, car 105 (Fig. 3) acts as reflector, directing light from beam 110 toward the receiver causing it to operate the signal as above described. I found that almost any object, even if its surface is comparatively dull, reflects an amount of light into the receiver sufficient to operate a highly sensitive circuit of the type described in the above patent.

In the installation shown in Fig. 3, the use of the last described embodiment is especially satisfactory since it eliminates any structure as mirrors or lanterns, on island 27. The receiver can be so adjusted that it will in most instances respond to objects entering between 27 and 85, but not to objects, as pedestrians on the sidewalk, at a greater distance.

Instead of arranging lamp compartment 71 and receiver compartment 72 as shown in Fig. 4, the lens system of the former and the hood of the latter may point in different directions, the light beam being then diverted as indicated in Fig. 5, where 111 and 112 are the respective compartments and 110 the beam reflected from 111 back to 112 by means of mirrors 115, 116, 119, 117 and 118.

As shown in Fig. 6, the signal bell or similar device 50 with magnet 55 and striker 56 may be mounted on unit 100 with lantern 101 and receiver 102. This embodiment of my invention is especially compact and obviates all special electric wiring; it will be understood that it will only be used if the attendant can be safely reached with the suitably chosen signal giver 50.

It is understood that different types of signals, for example visible ones, can be used, that, by arranging several receivers, different loading areas can be distinguished, and that the invention can be applied to other than gasoline filling stations and to installations where material is discharged instead of taken on.

I claim:

1. In a fuel dispensing station having a housing which encloses dispensing means and an electric supply circuit, a signaling unit mounted on said housing and including a lantern for projecting a detecting light beam at the approximate height of a fuel receiving object, light responsive electric relay means, and signaling means adapted for operation by said relay means, the optical axes of said lantern and said relay means forming such an angle that said object located in front of both lantern and relay means will reflect light from said lantern into said relay means effecting operation of said signaling means, and electric connections between said supply circuit and said signaling unit.

2. A supply station of the type described, comprising means for dispensing supply material, an approach along said dispensing means for placing a vehicle adjacent to said dispensing means within a probable filling area within which said vehicle can be reached from said dispensing means,

mounted on said dispensing means a signaling unit including light responsive electric relay means and a lantern projecting a light beam from said lantern into said area at the approximate height of said vehicle at distances from the boundaries of said area smaller than the length of an average vehicle, the optical axes of said light responsive relay means and said lantern forming such an angle that a vehicle in said area will reflect light from said lantern into said relay means, and means actuated by said relay means for giving a signal upon reflection of said beam into said relay means by a vehicle entering said area.

3. Device for use in supply dispensing stations of the type described, comprising dispensing means with a housing and an electric supply circuit within said housing, mounted on said housing a signaling unit including a lantern for projecting a light beam at the approximate height of an object to be detected, light responsive electric relay means and electric leads for feeding and connecting said lantern and said relay means, the optical axes of said lantern and said light respon-

sive relay means forming such an angle that an object in front of both lantern and relay means at said height will reflect light from the lantern into the relay means, and electric connections between said leads and said supply circuit of said housing.

4. A signaling unit for detecting the approach of an object comprising a housing, an electric supply line leading into said housing, within said housing a lantern having means for projecting a light beam at the approximate height of said object and a light responsive electric relay means, the optical axes of said lantern and said light responsive relay means forming such an angle that an object in front of both lantern and relay means will reflect said beam from the lantern into the relay means, electric leads for feeding and connecting said lantern and said relay means, mounted on said housing an electric signaling means operated by said relay means, and electric connections between said leads, said signaling means, and said supply line.

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