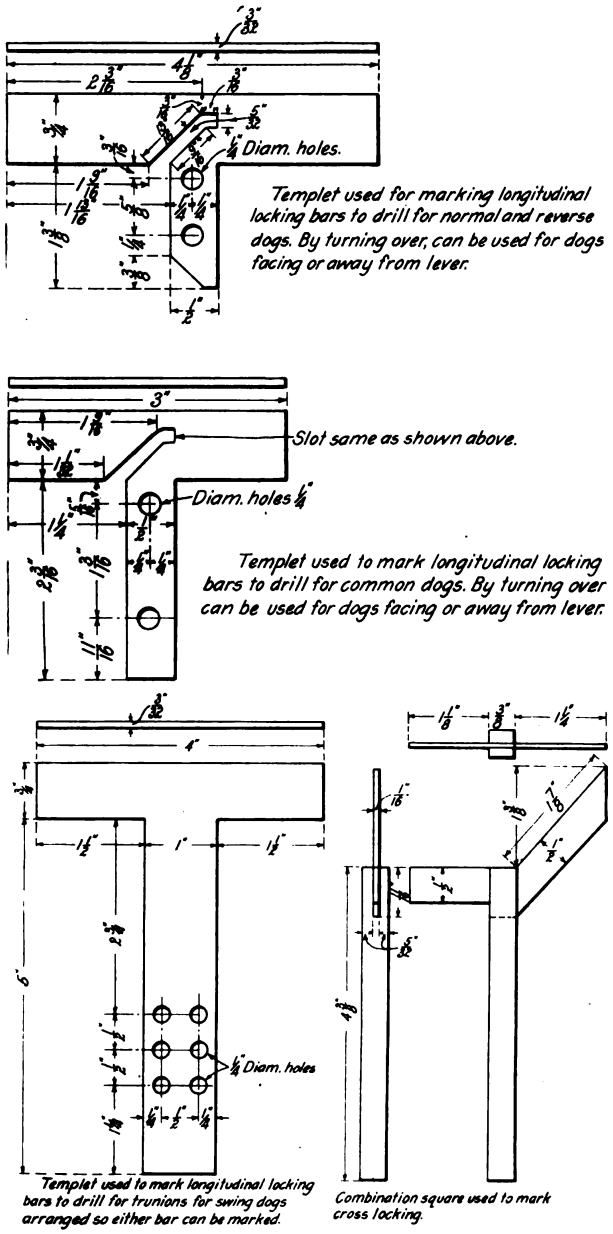
SQUARES AND TEMPLETS FOR MARKING LOCKING

When cutting locking and setting dogs success depends a great deal on the exactness of laying out and marking the dimensions. The illustration shows a set of templets and squares that have been used to a good advantage on



Templets for Marking Locking

S. & F. locking. The tools are made of steel and the sketch is self-explanatory as to the dimensions and respective uses.

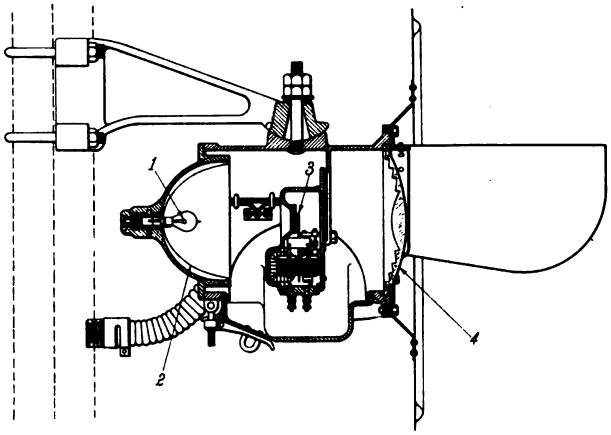
The English railways are replacing the red roundels with yellow roundels in most distant signals, in order to remove the inconsistency now existing in the signaling systems that certain red lights do not indicate "stop." It is also expected that the new requirements in regard to new railways will lay down the rule that the front of the arm be painted in accord with the yellow light.

New Devices

A NEW LIGHT SIGNAL

The Hall Switch and Signal Company has issued a bulletin describing its new color-light signal which was first displayed at the railway exhibit at Chicago in March, 1920. Figure No. 1 gives a good general idea of the principle and construction of this signal. The filament of the lamp is so located in the elliptical reflector, 2, that the rays of light are concentrated at the colored roundel, 3, and diverge again to meet the clear glass lens, 4, which collects these rays into a beam forming the signal indication. The color of the indication depends on the particular roundel which happens to be in the focal point.

These colored roundels, which are $\frac{1}{16}$ in. thick and 1 in. in diameter, are fixed in the vane of the operating mechanism. It may be readily seen that by this construction any external light entering the lens must pass through the colored roundel before it can reach the reflector, with the result that when the reflected rays



A Sectional View of the Signal

emerge they have been given the correct color, thus preventing the possibility of a false or phantom indication.

The relay mechanism operates in three positions, the red indication being given when the relay is de-energized. When the relay is energized by current in one direction the vane swings up, giving the green or clear indication, but when energized in the other direction the vane swings down, giving the yellow or caution indication. It is a fact that the retina of the eye holds an impressed image for about $\frac{1}{16}$ of a second. The mechanism is claimed to change the indication from yellow to green in less than $\frac{1}{16}$ of a second, consequently the signal does not give a red indication when changing from yellow to green.

The reflector has a highly polished, silvered surface which is adequately protected against corrosion and is said to retain its brilliancy indefinitely. The lens is made of clear flint glass, 10½ in. in diameter with a 6-in. focal length. This lens is of the Fresnel type, providing a toric formation which gives a downward spread of light for short range indications.

Standard electric light bulbs of four different specifications may be used for different ranges. For long range indications up to 4,000 ft. a 10-watt Argon gas-filled bulb is used. For ranges up to 2,000 ft. the 3-watt bulb is used. Either capacity bulb is furnished with two filaments so placed that they are looped one in the other,

and both located at the focal point of the reflector, one filament having double the life of the other and being of lower candle power. These filaments may be burned in multiple or one may be controlled through a cut-in relay, causing it to light should the main filament burn out. These features, under regular inspections, are expected to eliminate "lamp out" failures. All bulbs are provided with a double contact bayonet base with a special feature so arranged as to bring the filament of the lamp into the focal point. A re-enforced sheet-metal background 3 ft. in diameter is provided and a special hood extends forward over the lens to protect it from the direct rays of the sun.

A.C. Relay

A standard polyphase vane relay movement is employed as the actuating mechanism, the roundels being directly mounted on the moving vane in such a manner that they may be changed readily without interfering with any other part of the relay movement. There are no moving parts other than the vane and its necessary counterweight. In view of the absence of connecting links and other devices, the mechanism is considered more reliable than a standard relay. A liberal clearance is provided between the pole faces and the moving vane. The vane shaft is mounted in such a manner as to reduce friction to a negligible quantity. The whole movement is sealed up in a metal case provided with plate glass covered apertures for the passage of the light rays and inspection of the mechanism. All R. S. A. requirements are met and connections are made to R. S. A. binding posts mounted on a bakelite insulating panel on the under side, thereby allowing ready access at all times. Contacts are provided for repeating the signal indication for switch and tower indicator circuits.

D.C. Relay

The motor principle of operation has been employed for the d.c. relay. By the use of a special armature and field all necessity of a winding on the moving element with its necessary objectionable flexible connections has been dispensed with. The moving element therefore simply consists of a simple iron armature to which is directly connected the roundel-carrying member. This armature is mounted in a similar manner to the vane in the a.c. relay and the armature and counterweight are the only moving parts. Except for the necessary modification of the operating element the d.c. relay is identical in all respects to the a.c. relay above described. It should be noted that the a.c. and d.c. relays are interchangeable and one may be substituted for the other on the same mechanism at any time.

Universal Support

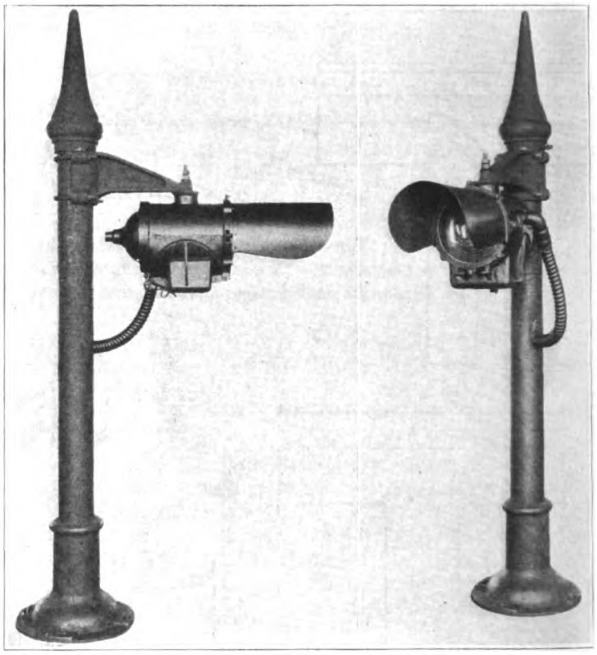
The signal is supported on a cantilever bracket by means of a universal joint which enables the signal to be swung in all directions for correct alignment of the projected rays of light. The construction of the support is such that the signal may be either mounted in front of the pole or on the right or left hand side as required by local conditions.

Circuits

The bulb is connected in multiple with the field winding of the relay movement in both the d.c. and a.c. signals. Control of the color indication is obtained by energizing or de-energizing a secondary winding, the relay mechanism being arranged to drop by gravity to the red position when the control winding is de-energized. On account of the control current being merely that required to operate the relay movement, the necessity to handle high amperage current at the relay points is entirely obviated. This eliminates the trouble of burned contacts and variation of resistance.

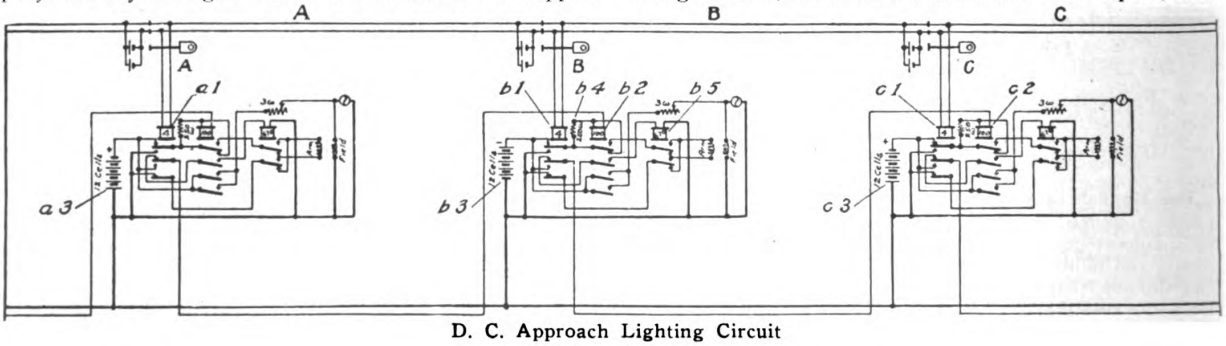
Approach Lighting

For an installation of d.c. signals where it is desirable to employ approach lighting for the conservation of energy, a special circuit has been developed as shown in the illustration. By an examination of the circuit it will be seen that this is accomplished by the use of three relays at each signal location and one control wire, together with a common.



Mechanism Applied to a Signal Mast

Briefly, the operatian is as follows: Upon a train entering block *A*, when the track ahead is unoccupied, track



D. C. Approach Lighting Circuit

relay a^1 will be dropped, which puts energy on the line and picks up the 100-ohm relay b^2 with batteries a^3 and b^3 in series. When relay b^2 picks up it cuts resistance b^4 into the circuit to conserve the current flow. The bulb and field winding of signal B are thereby energized through the front contacts on the relay b^2. Upon the operation of relay b^2 a circuit is closed from common through the winding of relay b^5; front contact of track relay b^1 to line; through winding of relay c^2; front contact of track relay c^1; through battery c^4 to common. This picks up relay b^5, which causes energization of the signal relay to give a clear indication. Should a train be standing in block C, the circuit through relay b^5 and c^2 will be opened at track relay c^1 and a caution signal will be given. In the event of a train standing in block B, all energy will be cut off the operating winding of signal B, due to the dropping of track relay b^1, and this signal will remain at red or stop.

It will be seen that the 100-ohm relay in advance of a train will always be positively picked up to energize the bulb irrespective of the track conditions ahead and that the indication is determined by the relative action of the track relays and the 670-ohm relays.

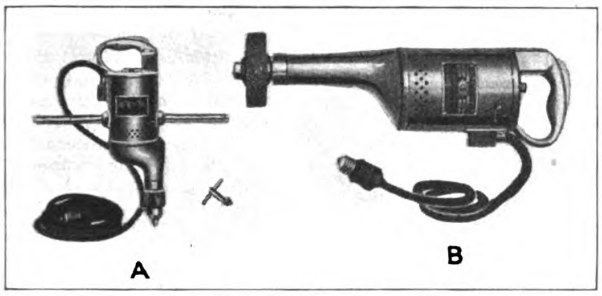
The whole system is normally de-energized with the exception of the track circuit, thereby giving a maximum conservation of energy, together with the advantage of a circuit which is at once simple and absolutely reliable.

It will be noted that the approach lighting feature has been accomplished over the same line as that used for the control of the indications and without interference with the track circuits.

An adjustable resistance b^7 is placed in series with the bulb in order that the voltage regulation may be maintained without the necessity of repeated changing of battery. The circuit is adapted to work to a point where the cells have dropped to 5 volts, which is the desirable minimum before replacing.

PORTABLE ELECTRIC DRILLS AND GRINDERS

The portable electric drill and grinder shown in the illustration are manufactured by the Wodack Electric Tool Corporation, 27 So. Jefferson street, Chicago, Ill. These tools are very useful on heavy parts that are not readily handled. The drill or wheel is driven by means

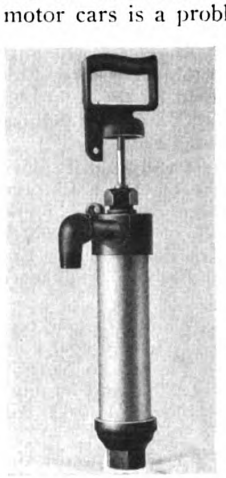


Wodack Portable Tools Equipped with Automatic Stop Feature

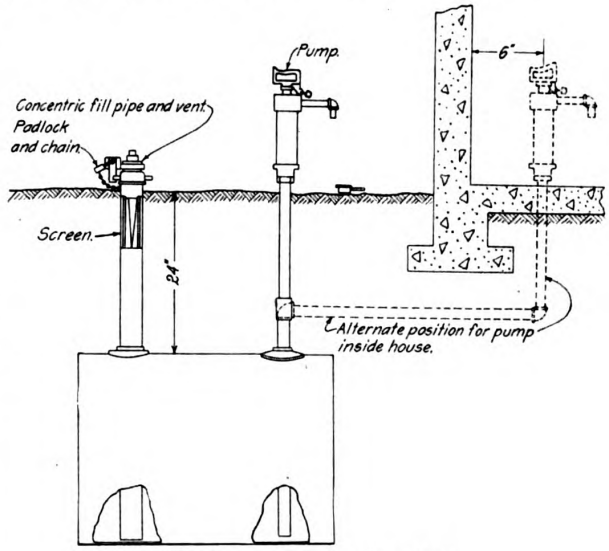
of a chrome nickel steel gear by a completely inclosed motor with self-oiling ball bearings. These motors operate on either d. c. or a. c. and are built to stand severe use, being guaranteed against a burn-out for one year. The motor will automatically stop when not in use, as the circuit is opened by the switch, which is released automatically when the operator removes his grip from the handle. The drills are made in six sizes and the grinders in four sizes.

A CONVENIENT STORAGE ARRANGEMENT FOR GASOLINE

Safe yet convenient storage gasolene and other fuel oils in the limited quantities normally provided for motor cars is a problem imposed on the maintenance of way department with each assignment of this equipment. Therefore, it is of interest to note that the St. Louis Pump & Equipment Company has developed a small storage outfit which is being manufactured in capacities ranging from 70 to 290 gal. for use by the railroads. The elimination of drums and other shipping containers or receptacles means the elimination of fire hazard and loss in quality and quantity of oil through evaporation, leakage, spilling, etc. These storage outfits consist of an underground tank with a concentric filling pipe and vent and an outlet pipe equipped with the type of pump shown in the illustration. This pump consists of a seamless brass cylinder with a brass plunger and weatherproof housing over the stuffing box. The handle is arranged to be secured by a padlock. A second padlock is provided to control the inlet pipe.



The Pump



The Storage Outfit Complete

The storage tanks, which are made of 14-gage galvanized steel, are normally buried 24 in. below the ground level with the inlet pipe and pump placed directly above the tank. However, with additional piping it is possible to bury the tank outside and install the pump inside an adjacent building, the entire equipment being complete with the exception of the horizontal pipe, which will be of variable length, depending upon the distance from the tank to the building.

Seven passengers and a motorman were killed and 20 passengers injured in a butting collision of electric cars between Bridgeport, Conn., and Shelton on February 22. Several persons were burned to death, the wreck having quickly taken fire from a can of gasoline (belonging to a passenger) which was in the vestibule of one of the cars and was ruptured in the collision.