

### A New Form of Grab Bucket.

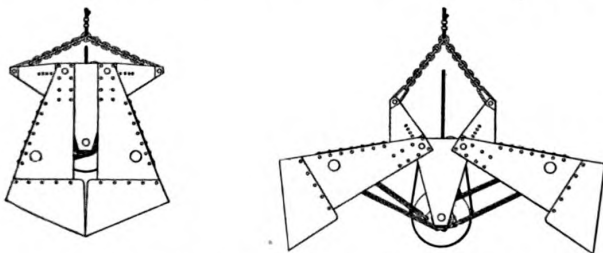
The grab bucket illustrated was introduced by the Andresen-Evans Company, Chicago, and has a number of features interesting to excavating contractors as well as to men in charge of power plants and coal handling apparatus. It is designed for handling all classes of bulk materials, such as coal, ore, etc. The grab is made in two types; one to be used with two



Andresen-Evans Grab Bucket Handling Lump Coal.

lines and the other with three or four lines. Both types may be used on two-drum hoists.

The drawing of the two line type shows the feature which first attracts the attention of practical men; namely, that the closing chains always pull in a direction parallel to the resistance. This, with the long lever arm, gives a powerful digging action and it is not necessary to drop the grab in order to insure cutting action. The grab continues to sink during the loading process and excess material is forced out of the backs of the scoops. This insures a full load without packing and the



Open and Closed Positions of Two Line Grab.

grab is always closed before hoisting. The main advantages claimed for this grab are: Powerful digging action; wide opening over which the digging action takes place; positive opening; small head room required; small drop of scoops in opening; low center of gravity and wide base when open such that it will not tip over when digging on side of pile, and simplicity and rigidity of construction.

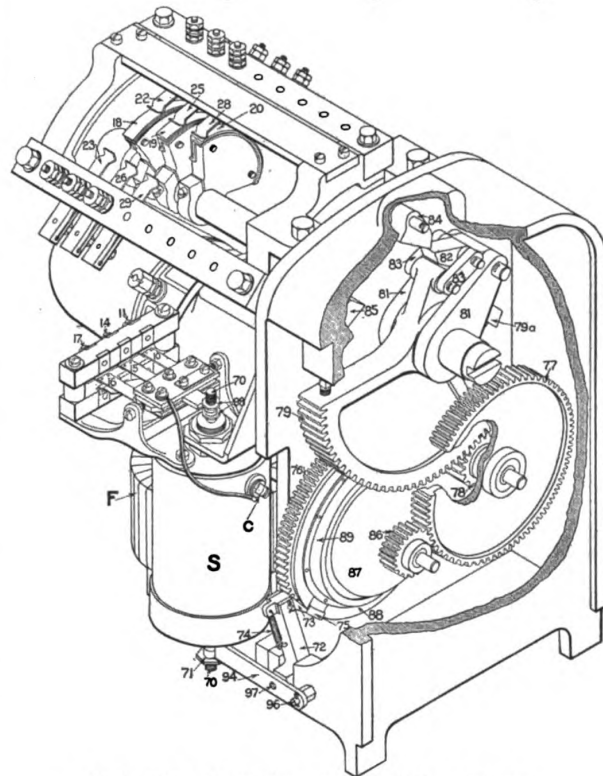
It is also to be noted that the grab is well braced in all planes, has castings of steel and bearings of phosphor bronze. This grab has been perfected after two years of service at

various plants under different conditions and handling different materials.

### The Union Style "T" Signal.

The Union Switch & Signal Company, Swissvale, Pa., has recently put on the market a new type of signal known as the style "T." This signal is designed to meet all the conditions and requirements of modern block-signal practice. It is a "top-post" semaphore, adaptable to upper or lower quadrant two or three-position indications, and designed to be placed on top of the signal post or clamped to it, as conditions require. Other distinctive features are a light and compact mechanism, in which great strength and high efficiency are secured, and a number of safety precautions, among which is the motor drive to the normal position.

The mechanism comprises a motor of the bipolar type, with a toothed armature and two independent shunt wound fields, a holding-clear device, consisting of a magnet and a lever arrangement circuit controller, a clutch, and a mechanical lock. One of the motor field coils is energized when the signal is clearing, the other when the signal is returning to its normal position.



Mechanism for Union Style "T" Semaphore.

One coil has less resistance than the other. This is to permit a greater generated current to flow when the signal is going to stop than when it is clearing, because in clearing the weight assists in stopping motion, whereas in going to stop the weight is added to the load to be overcome by the motor.

The construction of the pole pieces is such that the teeth of the armature pass into and out of the magnetic field gradually, there being no point at which the magnetic attraction is greater than at the points adjacent on either side. The forces on the armature due to the field alone are, therefore, balanced in all positions of the armature, and it is as free to rotate when the field is energized as it is when the field is not energized. Thus there can be no tendency to hold the signal clear, even though the field should be excited, with no current in the armature.

The circuit controller is operated by the holding clear magnet which has two coils, one to pick up and one to hold up its armature. When the magnet is energized the motor circuits for clearing the signal are closed; when de-energized the motor circuits for driving the signal to stop are closed.

A clutch is interposed between the motor and semaphore to



prevent straining or breaking any part of the mechanism if it should occur that the motor failed to hold the semaphore, as it would if the circuit happened to be open. Without this clutch some part would be certain to break or be unduly strained if the semaphore should drop from clear to normal without any retardation. If to secure the mechanism against strain were the only consideration a simple ratchet would answer the purpose, but when to this requirement is added that of driving the signal to its normal position by the motor, something more than a ratchet is required. The clutch must hold enough to permit the motor to exert its force on the semaphore, and must let go before the stress becomes great enough to produce a strain.

The mechanically operated circuit controller for opening the motor circuit when the semaphore has reached the position corresponding to the state of the track ahead, and for selecting the slot magnet circuits between the caution and clearing wires, comprises insulated sectors carried by the semaphore shaft, which co-act with brushes supported on and insulated by wooden bars carried on the frame of the machine. Three of these sectors are regularly employed; one for controlling the magnet circuits, another for controlling the motor circuits when the signal is clearing and a third for controlling the motor circuits

rods are free to turn in the bushings of the shafts as well as in the bearings in the frame, and by reason of their small diameter, and smooth hard surfaces, form bearings that are nearly frictionless. The semaphore shaft is made of high carbon steel, the hard smooth surface of which will not seize the bearings.

The style "T" is now being installed in connection with interlocking and block signal work on the Baltimore & Ohio, the Chicago, Milwaukee & St. Paul, the Great Northern, and other roads.

#### An Electric Fixture for Car Lighting.

Years of experience in the manufacture of car lighting fixtures has assisted the Safety Car Heating & Lighting Company, New York, in producing an electric fixture with many new and commendable features.

One design of this fixture, shown in Fig. 1, preferably uses the 40 candle power tungsten lamp, with a shade designed to insure brilliant illumination and at the same time completely diffuse the objectionable glare of the bare tungsten lamp. This shade is held securely by a shade holding device, Fig. 2, which is in successful use on several thousand fixtures. A slight pressure inserts the neck of the shade in the split cone grip and it is locked by screwing down the ornamental ring or nut. This securely holds the shade while preventing breakage from uneven pressure and allowing expansion of the shade due to heat.

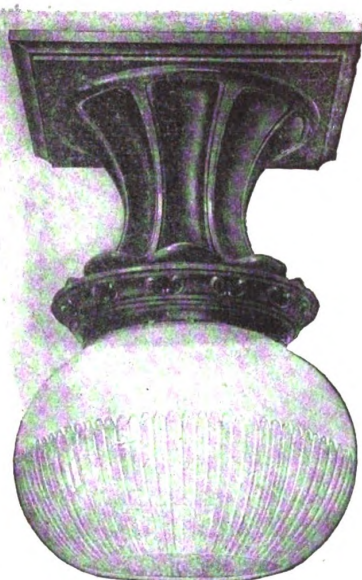


Fig. 1.



Fig. 2.

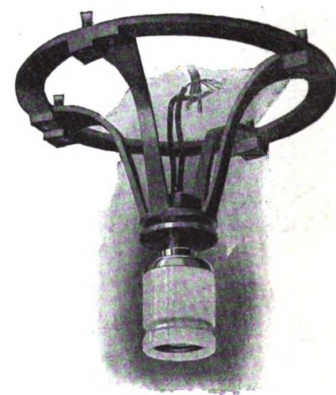


Fig. 3.

#### Electric Fixture for Car Lighting.

when the signal is returning to normal. The last mentioned sector has a notch cut in its periphery, for the purpose of opening the motor circuit, for an instant, just before the semaphore reaches the caution position, to permit of its stopping at this position if the state of the track ahead requires such a movement. Other sectors may be added if the signal is required to control circuits extraneous to its own government. A mechanical lock is provided, when required by the purchaser, to prevent the signal being cleared by hand.

The semaphore shaft is formed in three parts joined by tongue and groove couplings. One part carries the sectors of the circuit controller, another, the segmental gear, and the third the semaphore arm. This construction permits of the removal of the circuit controller without disturbing any other part, and allows the entire mechanism to be removed, leaving the semaphore arm in place.

Every precaution has been taken in the design of the signal to reduce friction to a minimum. Ball bearings have not been used, as they add considerable to the cost of the signal, and tests show that there is very little, if any, diminution of friction by their use. The motor has bearings of very small diameter provided with self oilers. The bearings of the two intermediate shafts are formed by boring large holes through the shafts, in which short brass bushings are inserted at each end of the shaft. Through these extend small Stubb's steel rods. The

Another feature is illustrated in Fig. 3. This shows the interior or electrical parts, designed to allow removal of the exterior or ornamental parts, including the shade and shade holder, without disturbing the electrical connections. This should be appreciated as a time saver by both the electrical department and shop foreman in repairing or refinishing cars. The illustrations show only one design of this type of fixture, but the construction allows great latitude in artistic treatment to harmonize with any interior finish or class of railway cars.

#### FOREIGN RAILWAY NOTES.

The total mileage of new railway projected in Bolivia in 1909 was 863 miles. A continuation of the main railway line under construction is needed to make a connection between the Argentine system of railways and to form part of a through route from Lima, Peru, to Buenos Ayres, Argentina.

By an executive decree of October 28, 1909, the government of Brazil was authorized to make a contract with the Great Western Limited for the extension of several lines leased to this railway company. The survey for these extensions have already been made, and work will shortly be begun.