

and dry ash pit are exposed to the damaging temperatures. Particular care must be taken in the fitting of these doors in the generator so as to make them air tight.

In the suction producer there must not be leakage of air into the generator through these doors, since it would interfere with the proper operation of the generator; and in the pressure plant there must be no leakage of gas from the generator as it is very poisonous. To accomplish this end the engaging surfaces of the frame and the door are carefully finished, and the door is pressed firmly against the finished surface of the frame by means of a screw which operates through a yoke

hoppers is the style of valve between the preliminary chamber and the generator; and charging hoppers may be divided into three main classes in this respect, namely those having cock valves, those having lift valves and those having slide valves. These three types of charging boxes are shown in Fig. 4. First and second are illustrative of the cock valve, third and fourth of the lift valve and fifth, sixth, seventh and eighth of the slide valve.

The cock consists of a large cast iron cone, provided with an opening and operated with a handle, which revolves in a sleeve formed in the charging box. The chief advantages

of these valves does not appeal to one as being a good or serviceable one. The advantage which may be claimed for them is their simplicity of design; but the actual construction, if well done, cannot but require considerable work, in the case of the Tangye at least.

FEED HOPPER.

Most generators are provided with hoppers situated below the charging box, for feeding the coal uniformly to the generator, and also to act as a storage chamber for the fuel. These are known as feed hoppers. Usually they are tapered conically downward, but are sometimes cylindrical, and are made of cast iron. They are removable and easily replaced. The annular space between the feed hopper and the lining of the producer acts as a receiving chamber for the gas, which imparts some of its heat to the coal before proceeding through the external vaporizer.

In the case of generators having the vaporizer within themselves, the feed hopper often forms part of the water tank, and the main part of the hopper is above the top of the generator. But in the Crossley generator this is not so. Here the hopper forms part of the water tank, but that part of the tank projects down into the generator allowing the hot gases to come in contact with a large heat absorbing surface.

[The next article in this series will be a continuation of the suction plant, taking up the manner of air supply; the vaporizer; dust collectors; cooler, washer and scrubber; purifying apparatus; gas holder and regulating bell; pipes and connections—EDITOR.]

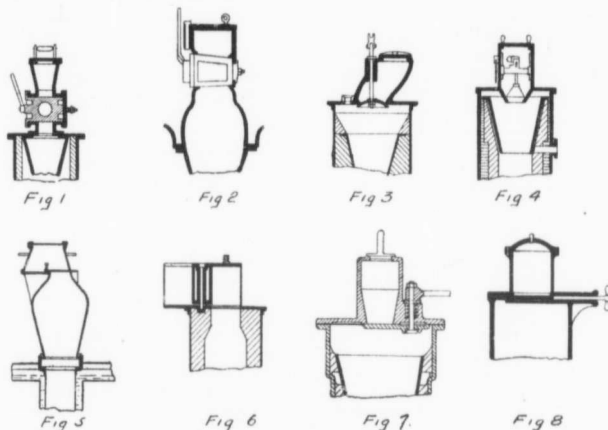


Fig. 4—Different Styles of Hoppers.

spanning the door and resting on the producer. The pintles of the hinges should be carefully adjusted so that the joint members of the door shall remain true. Some authorities claim that hinges with horizontal axes are preferable to those having vertical axes. The door of the furnace in the best practice is lined with refractory material to protect it against the radiated heat of the fire. To enable the grates to be cleaned with a tool, the doors are sometimes provided with holes, closed when not in use with air-tight plugs.

CHARGING HOPPERS OR BOXES.

There are almost as many styles of charging boxes, or apparatus for charging the generator with fuel, as there are makes of generators, but all of these incorporate one of two principles, a single closure or double closure.

In the double closure principle there is a preliminary chamber with two openings, one to the outside air and one to the generator, both of which have devices for closure. In this principle the charging operation consists of first charging the preliminary chamber with fuel and then emptying to the generator when the opening to the atmosphere has been closed. This prevents any inrush of air to the generator in the case of the suction plant, and any escape of gas from the pressure plant.

The single closure principle is very poor, and is not employed in any good type of generator; and for that reason our attention will be devoted to the other principle.

The point in which there is the radical difference between the many types of charging

of this type of valve are its simplicity, compactness, strength and the ease with which it can be taken apart for cleaning.

The lift valve consists of a conical or partially spherical shape, which is moved up and down by means of a lever; this is held in position either by means of a counter weight as shown in the third illustration, or by the weight of the valve and the fuel in the box as shown in the fourth illustration. This style of valve insures a tight joint irrespective of wear, and has the advantage of evenly distributing the fuel as it falls into the generator. But it is apparent that to insure easy and smooth operation in the case of a valve such as illustrated in the fourth illustration, there must be careful designing and considerable strength of parts.

Styles of the slide valve as commonly spoken of are shown in the seventh and eighth illustrations, used in the Bernier plant, and the Tangye plant respectively; but the valves used in the Crossley charging box and the Pintsch, shown in the fifth, and sixth illustrations, respectively, must also be included in this type. This slide valve closure commonly consists of a smooth finished metallic plate movable below the charging box, either in a revolutionary way, or in a longitudinal way. The disadvantages of the slide valve, as illustrated in Figs. 7 and 8, can easily be imagined; since the plate is operated from the outside, it is evident that the slightest play, the wearing of the pivot or the weight of the charge, will form spaces between the plate and its seat, through which air may rush in or gas escape, according as

Open Meeting of No. 1. C.A.S.E.

On November 20 an open meeting of Lodge No. 1, Toronto, of the Canadian Association of Stationary Engineers was held in their rooms. An address was given by C. B. Turner, New York, on Formation and Prevention of Boiler Scale.

On December 18 a smoker will be held, at which a short address will be given.

Catalogues Worth Having

These Catalogues will be sent by the firms upon request. Mention The Canadian Manufacturer.

LIME KILN COSTS—"What are Your Lime Kiln Costs?" is the title of an attractive booklet issued by the Harbison-Walker Refractories Co., Pittsburg, Pa. The booklet contains an attractively illustrated article emphasizing the fact that quality is cheapest in the end, and telling of the methods of this company in the manufacture of fire brick specially suitable for the lining of lime kilns.

DIAMINE COLORS ON COTTON YARN—Catalogue of the Cassella Color Co., 182-184 Front Street, New York, containing samples of Diamine colors on cotton yarn. The catalogue is 6½ inches by 10 inches by 2 inches thick. It is a most complete and valuable catalogue of reference for manufacturers using dyestuffs. In the front of the catalogue are detail instructions as to the use of the dyestuffs.