Construction of Grate.

The driving mechanism of the stoker is contained in a rigid bearing so that the wear on it and the power required to operate it are reduced to a minimum. The chain itself is formed of substantial links so designed that certain ones, designed especially to take the strain, carry the entire tension, the other clips being so designed that they are not subjected to the tension of the chain. A uniform

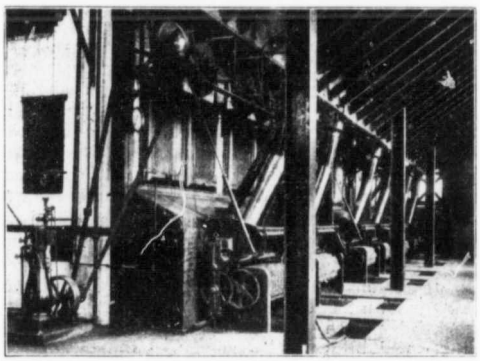

Fig. 7—An Installation of Green Travelling Link Grates.

air space around each link is provided. The longer links afford an increased overhang, so as to shear any clinker, which during the travel of the grate, may be brought up to the bridge wall, while at the same time it completely clears the ash from all the air spaces of the chain at every turn around the rear sprockets. The links of the chain are connected together by bars of oval section, which pass through round holes in the links or clips.

The holes in the clips have a slot extending to the bottom edge, permitting any link or clip to be removed and replaced by another one without breaking the chain, removing the bars or interfering with the service.

The chain is supported at frequent intervals by rolls extending under the entire width.

The side frames and side girders are designed to be removed from the direct heat of the fire so that they are never cracked or burned due to this cause.

Operation of Stoker.

The coal is scraped off to a uniform thickness the entire width of the chain by means of an adjustable ventilated gate which can be set at any height from 2 ins. to 8 ins.,

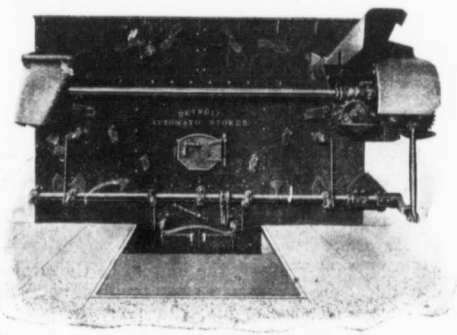

Fig. 8—Front View, Detroit Automatic Stoker with Worm Conveyor Feed.

and which, due to its design, permits the ready replacement of such of its parts as are most liable to failure.

As the fresh coal enters the furnace it is subjected to the radiated heat from the igniting arch, which causes it to instantly ignite. The uniform distance of this arch above the grate surface causes uniform intensity of ignition the full width of the furnace, which in turn causes uniform termination of the combustion and renders it possible to operate the stoker without bare spots on the grate surface. The arch itself is suspended from steel beams and the tile are made interlocking so that one or more can be removed and replaced without dissurbing the rest of the arch.

The harder this stoker is operated the cooler it runs, and there is no rate of combustion so intense that it will injure the stoker. At each revolution the chain is cooled down to normal temperatures, and even at high ratings the hand can be comfortably placed on the chain just as it enters the fire.

The Green chain grate is made in two types, the standard grate suitable for the bituminous coals of the central and western part of this country, and the coking coal stoker, suitable for the semi-bituminous coals of West Virginia and Eastern Pennsylvania. Fig. 7 shows an installation of standard grates.

The Detroit Autcmatic Stoker.

From figures 8, 9 and 10 a good idea of the mechanical construction of the Detroit automatic stoker, made by

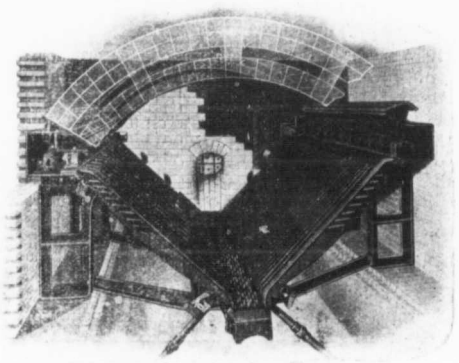

Fig. 9—Rear View, Detroit Automatic Stoker with Worm Conveyor Feed.

the Detroit Stoker & Foundry Co., Detroit, can be obtained. This stoker has side feed, incline grates and an automatic clinker crusher. It is built with two distinct methods of feeding the fuel, one the worm conveyor, which is the more commonly used, and the other the reciprocating method, which is only recommended when the dutch oven or extension front is used,

The coal is fed into the hoppers in front, either by hand or by gravity, as in Fig. 10. It is then fed into the stoker by means of the worm conveyors, and distributed evenly at the top of the inclined grates on the cooking plate.

Air is admitted through openings in the upper portion of the front of the boiler, as shown in Fig. 8, between the double arches, shown in Fig. 9. Thus the air can be controlled, and is heated before it strikes the fuel.

In Fig. 9 the right side air chamber and arch support is raised to show the end thrust ball bearing conveyor.