locomotive and season of the year, may be consumed in getting an engine over the ash pit.

*The Locomotive Crane.*—The locomotive crane system is found in certain localities to be admirably adapted to the rapid and economical coaling of locomotives, and is extensively used for the handling of ashes. Among its many advantages is its usefulness in the handling of other materials, such as sand, ore, etc., and that, when fitted with a crane-hook, it may be transported from place to place and employed as a light wrecking crane.

The crane has the functions of hoisting, rotating, and travelling under its own power. One operator consists of a supporting frame and boom, drums, engines, boilers, etc., the latter rotating oppositely to and counterbalancing the loaded bucket. The truck supporting the machinery is of standard gauge, and is driven by gearing from the engines.

The grab bucket used for handling coal and ashes has the advantage of a certain excavating power when seizing the material, so that flat-bottomed cars and ash pits can be scraped almost completely clear, causing a great reduction in the cost of labour.

At coaling stations of this type, the coal is either transferred by the crane directly from cars to the engine tender, or from storage, if such be provided. This generally consists of either a ground pile, pockets, or pits.

In the first case coal is taken from the cars by crane and piled by the side of the track within easy reach. As much as 10,000 tons can be thus held for emergency requirements.

Pocket storage is generally provided either for the purpose of weighing the amount taken by each engine or to insure extra rapid fueling. An overhead bin adjacent to the fueling tracks is subdivided into pockets of known capacity, provided with sloping bottoms, gates, or chutes. These are filled and kept so by the crane during slack hours either from pile storage or from cars.

Pit storage is also sometimes provided beneath the tracks, where a large number of self-clearing cars is available. The crane transfers coal direct from these pits to tender.

At the Cleveland yards of the Erie Railroad the crane takes coal from the cars on a side track and delivers it to the tender while the ashes are being removed from the engines.

For this purpose there is provided beneath the locomotive track a concrete pit sloping outwards, so that the ashes will fall into the clear space at the side, from which they are lifted and dumped into cars by the crane.

The crane makes over fifty trips per hour, and operates a 2-ton grab bucket. Such a coaling station requires only the services of