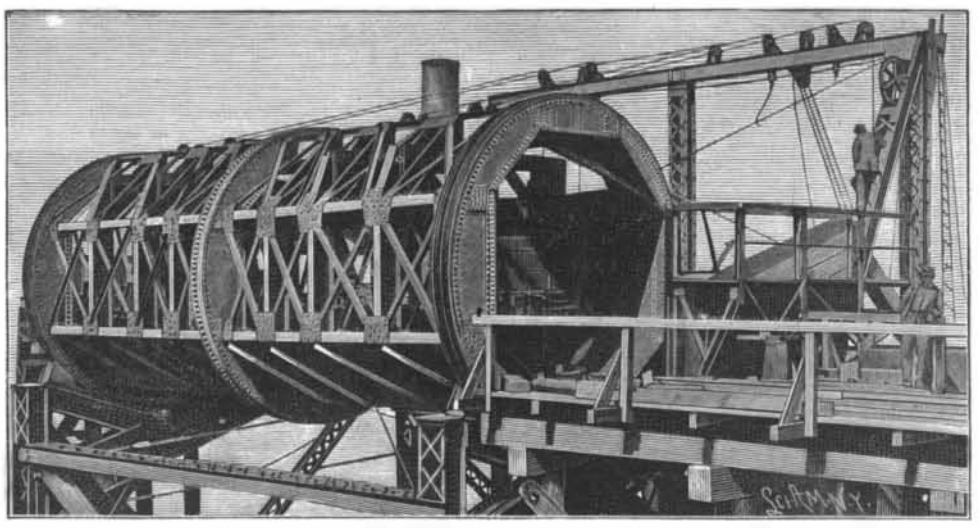
A COAL CAR DUMPING MACHINE.

Great progress has been made during the past two years in loading and unloading vessels for shipment, and most especially is this true at the lake ports, where it is necessary to handle with great dispatch cargoes of iron ore and coal. The old method, which existed for years, was principally hand work, and the cost of unloading coal by hand was about twenty-five cents a ton. The coal was transferred from cars to vessels by slow working cranes, which could do but little in the course of a day. At many ports there were not even cranes, and wheelbarrows and "navvies" kept a vessel tied many hours at dock when she might have been on her way making something for her owners.



A COAL CAR DUMPING MACHINE—THE CAR HANDLING CYLINDER.

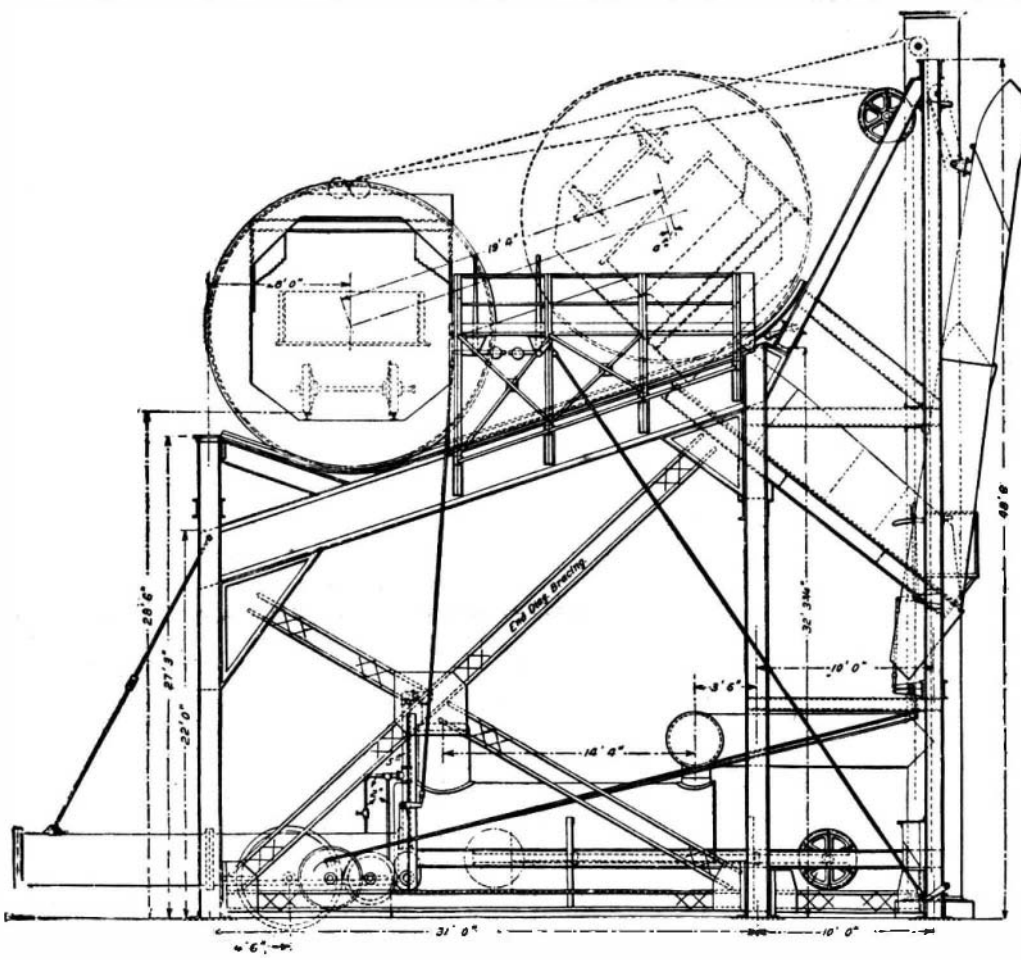
Of the many efforts which have been made to perfect machinery for doing this work, none seem to have met with the success reported of the Long dumping machine, recently perfected in Cleveland by the Excelsior Iron Works Company, and which is shown in the accompanying illustrations.

At a very recent test on the docks of the N. Y., P. & O. Railroad in the city of Cleveland, this machine actually made a record of unloading three ordinary railroad coal cars into a vessel in three minutes. The coal was what is known as ordinary lump Massillon, and it was transferred from the cars to the vessel with absolutely no assistance other than the handling of this machine.

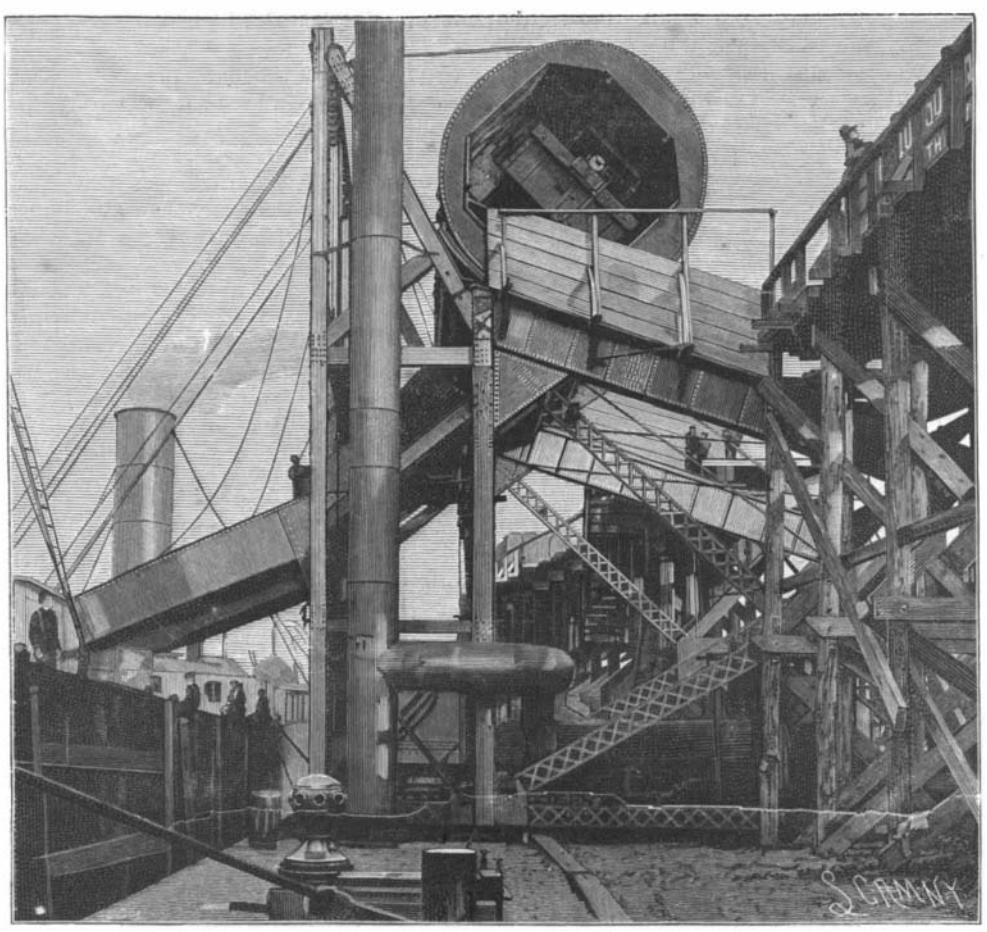
The machine is the invention of Mr. Timothy Long, a practical designer who has been connected with the Excelsior Iron Works for a number of years. The car dump consists mainly of a large cylinder, with an inside diameter of 11 feet, and an outside diameter of 16 feet; the length being 40 and the circumference 52 feet. It is set 28 feet above the level of the docks, but on a level with the company's tracks, one of which runs through the cylinder when the latter is at rest. The coal-laden car is set in the cylinder by means of a switching engine; and by the time the car is detached from the train, it is clamped firmly by means of a beam running along the side. This beam acts by hydraulic pressure and the car is held rigid by four iron clamps which fall upon the top of the car's sides, and which are firmly held in place by keys fitting in cogs. These clamps act automatically when the cylinder begins to roll.

This clamping process is the work of an instant, and, by means of a lever worked from the end of the cylinder, an engine on the dock level is started. This engine has a cylinder 30 inches in diameter by 19 feet stroke of piston, and a single stroke is all that is necessary to roll the cylinder up an inclined plane into the position shown in one of the engravings, when the coal rolls out compactly into the chute. When the coal leaves the car, the chutes stand out horizontally, which prevents the coal acquiring any momentum. As soon as the cylinder begins to roll back, the chutes are gently lowered by means of another engine on the dock level, and operated by a man standing between them, until the coal is allowed to pourgently into the hold, the breakage being thus reduced to a minimum, which is something less than when it is handled by being shoveled into buckets and then dumped into the hold by means of "whirlies." Both the cylinder and chutes are operated by means of wire cables, and the operation of the whole machine is so simple as to add greatly to its value, there being no complicated machinery to get out of order. The cylinder is made absolutely accurate in its movements by a series of four inch holes being bored in the perimeter near each end of the cylinder, which fit upon cone shaped pins on the inclined track. This gives all the advantages and none of the disadvantages of a cogwheel arrangement.

The great points in favor of the Long car dumping machine are as follows: The machine operates rapidly; it empties cars of all sizes, in any order, without adjustment being necessary; and the coal breakage is reduced to an absolute minimum. The machine is comparatively cheap as to its first cost, and is economical of operation. The construction, while solid, is not complicated, and can be erected at low cost. Only three men are required. These are the engineer or fireman, a man to operate the cylinder, and a third to operate and control the movements of the chutes. The machine has duplicate boilers, one for use in case of emergency; but the entire apparatus is operated with only 80 pounds of steam. The stoppages usual to any new type of machine have, of course, occurred, but the changes necessary were very trifling in character, and in no way reflected upon the usefulness of the machine.



A COAL CAR DUMPING MACHINE—END VIEW.



A COAL CAR DUMPING MACHINE—THE CAR BEING DUMPED.

Long Tongued Bees Needed.

A correspondent of the Country Gentleman says: The giant bees, which are the principal source of honey supply in the Madras Presidency, are about one-third larger than ours. They build one single sheet of comb, about 18 by 18 inches, and 3 or 4 inches in thickness, attached generally to the under side of protected rocky cliffs. I now not only believe there are several ways by which a cross of these bees with the Italians can be made to increase their size, but (better still) that these India bees can be domesticated in our frame hives by using comb foundation, with larger cells, and in wider frames—probably 1¼ to 1½ inches. It might also be necessary to use some of our frames with finished drone comb alternately with frames of foundation, which would compel them to build even and straight combs. If we can get a fixed type of bees with tongues long enough to sip all the honey from red clover blossoms, the money value and the food value of our clover crops would be doubled.

I wish the government would either send as consul to the Madras district a practical apiarist, or (better) send one as special agent to experiment with the giant bees on the lines I have referred to. Five thousand dollars would, probably, make a fair test. If a new bee or cross can be introduced here, it should be done through experiment stations at cost, or at reasonable prices, to prevent extortion by the queen dealers.

Out of 120 colonies in my two apiaries, some five or ten of them have stored this season considerable red clover honey. But they can only get a small part of it from the shortest blossoms. One-sixteenth to one-eighth of an inch added to the length of their tongues or proboscis would be worth millions to us.

To Mend Broken Plaster Casts.

Paint the broken surfaces over two or three times with very thick shellac varnish, and at each application burn out the alcohol over a flame. When the shellac is sufficiently soft, press the parts together, and hold in position till cool. It will be as strong as it was before broken.