

A SWINGING HYDRAULIC CAPSTAN.

We have already described the electric capstan devised by the Railway Company of the North, for the maneuvering of locomotives and cars at stations. Its essential principle, which is the transmission of electric energy to a distance, merits attention and constitutes a genuine progress. It would, nevertheless, be absurd to consider it as a final solution of the question, for the moment at least, by very reason of the special expense that at present attends the production of electric energy. In many cases, when we have a natural hydraulic power at disposal, or when we have a mechanism at hand that permits of accumulating and storing an excess of power, we shall still have recourse, with advantage, to the use of the transmission of hydraulic energy, the well elaborated elements of which have, on their side, reached true perfection.

Armstrong was the first (as long ago as 1853) to point out the utility that the use of water under pressure might present for loading and unloading, and for industrial purposes; and he made an application of it which has remained classic. The improvements introduced into the three-cylinder Brotherhood engine greatly extended this principle; but it was soon found that there was one drawback to the use of it, and that was losses of head and leakages in the conduit that carried the liquid, and it is to this inconvenience that must be attributed the relative slowness with which so practical a means of action has been developed.

But this has been remedied, let us hasten to say, and in recent years, while waiting for electricity to have its final word, models of hydraulic apparatus of great perfection have been combined. We observed some interesting examples of these at the exposition of 1889, and, in order to complete the series of apparatus of this kind that we have already described, we shall give a short description of the swinging hydraulic capstan of Fives-Lille, which completely solves the hydraulic problem.

Our engraving will help to make it understood. This capstan, which was elaborated in 1884 by the Fives-Lille Company, in view of the application of hydraulic maneuvers to the apparatus of ports and railway stations, has received two important applications, one at the establishment of coaches at the Saint Lazare station, and the other for the service of the wharves of the port of Marseilles.

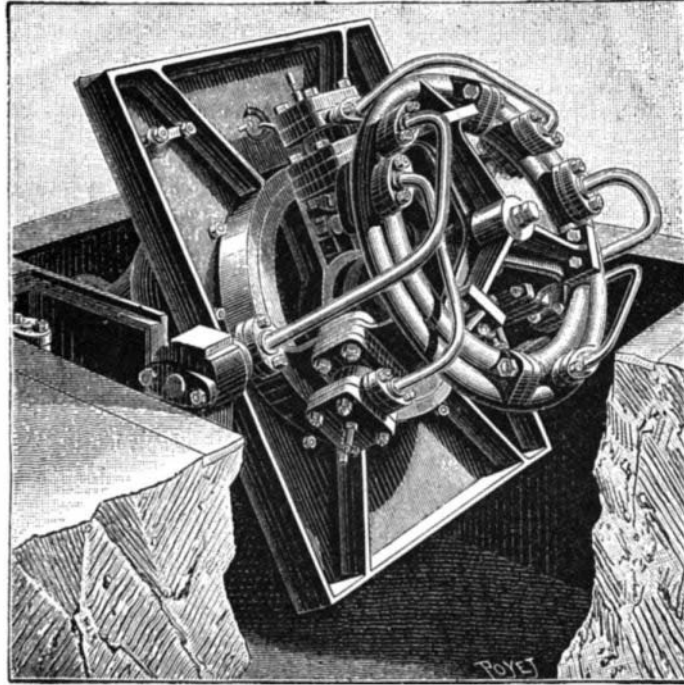
It is formed of two parts, which are distinct, but interdependent; one of them, above ground, constituting the drum around which the maneuvering rope winds, and the other, in a pit, containing all the mechanism and covered with a cast iron plate established flush with the surface and serving as a frame in common. The plate is capable of revolving on two journals through which the motive water enters and makes its exit, so that it may be made to turn upside down when it is desired to inspect the mechanism, or can even be used while it is thus reversed. In the old systems, on the contrary, the inspection of the mechanism placed in a pit underground and permanently fixed, was a most difficult matter. The motive cylinders in this apparatus are stationary and simple acting. They are situated in three different planes of action, and each is supported by a sort of vertical bracket cast in a piece with the central support of the driving shaft.

This arrangement presents the advantage of leaving between the cylinders free spaces, through which the mechanism can be easily got at. Moreover, the distributing valves of the water under pressure move flat, and each is balanced by a small compensating piston, which reduces the friction and diminishes the wear.

In order to set the capstan in operation, it suffices to press with the foot, a pedal that projects from the support, alongside of the drum. This pedal opens a valve which controls the entrance of the water under pressure, and the capstan is set in motion with the precision of a large piece of clockwork, of which, in reality, it has all the finish, despite its weight and power.

Hydraulic capstans will assuredly always remain one

of the primordial loading and unloading apparatus of the wharves of our seaports; but for the service of railway stations we must expect to see the disappearance from them, in certain cases, of the external part around which winds the rope serving to give a rotary motion to locomotives and cars. It has been found, in fact, that it is no more difficult and that it is more practical to give turntables this rotary motion directly, as soon as the car or locomotive is placed upon them. This modification, or rather this simplification, is un-

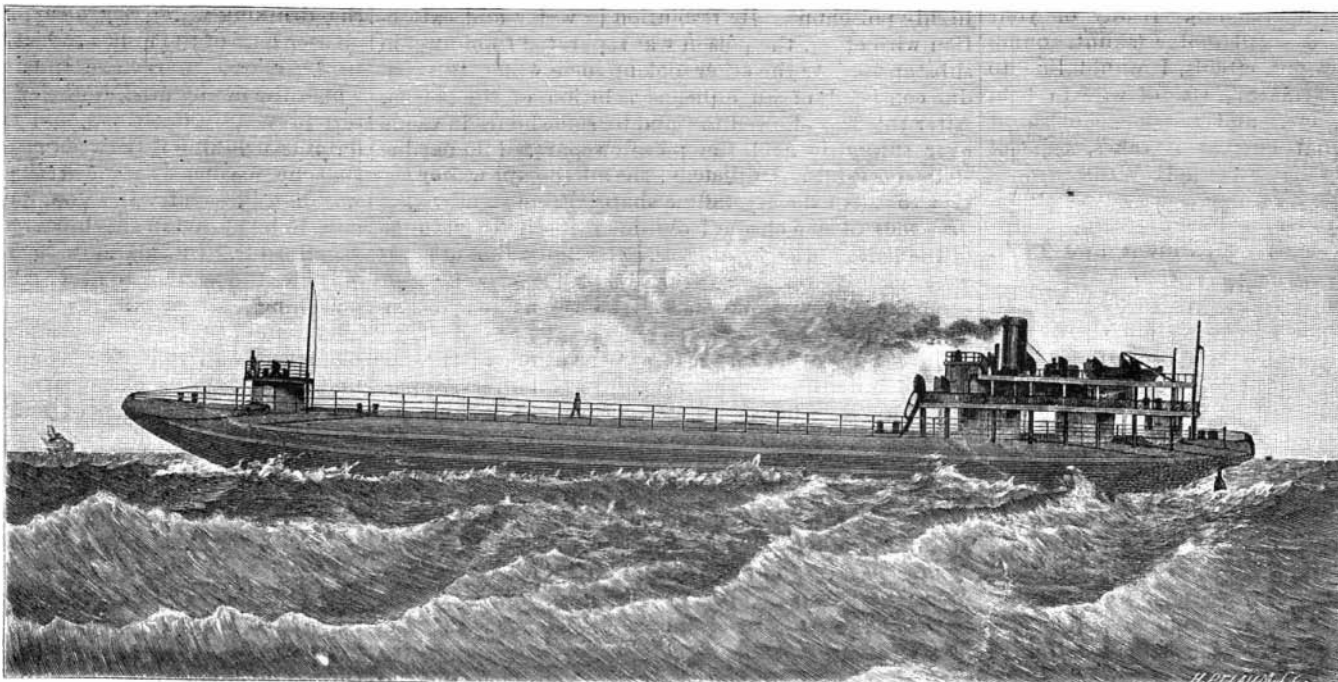


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der study with several of our large companies. As for the maneuver by rope, that will be reserved for pulling single or coupled cars upon sections of track for the purpose of making up trains.—*La Nature*.

NEW FORM OF TOWING STEAMERS.

We illustrate herewith the first steamboat built by the American Steel Barge Co., of West Superior, after Capt. Alex. McDougall's model for whale-shaped freight carriers. It is with this class of steamboats—if all that has been said of the queer-shaped craft can be believed—that Capt. McDougall proposes to handle one hundred of the tow barges in the coal and iron trade. When one hundred, or even a smaller number, of the tow barges have been turned out of the West Superior ship yards, slips will be provided for them at both ends of the route. The steamboat coming down the lakes will bring a tow of the barges laden with ore, and, returning immediately, will use the same crews with another tow of the barges, light or loaded with coal, as occasion may require. The slips will facilitate



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the handling of the barges, so that the steamboats will spend very little time in port, and the cost of labor on board the boats will be greatly reduced. They will be handled as locomotives handle railway cars.

This is only one of a number of stories that have been told of the plans for great work in the freight-handling line with the McDougall barges since construction on the first of them was begun three years ago. There is no denying that the builders are backed by a wonderful amount of capital in the American Steel Barge Co. for the construction of this kind of craft, and now that a steamboat follows five of the

tow barges already in commission, and making money for their owners, additional interest is attached to the strange fleet in the lake marine and the bearing it may have on the cost of carrying bulk freight. Not a few of the owners of the lake floating property are of the opinion that the barges will carry ore and coal with profit at low rates, on account of the cheapness of the construction, but the shipbuilders who go on building costly steel and wooden ships for iron mining companies and individual capitalists point to the care with which the few whale-shaped barges have been handled in mild weather, some of them declaring at the same time that they will build the new style of cheap boats for any one who may want them, when business in the old line gets slack, irrespective of any of the patents which Capt. McDougall claims. They say that there can be no patent on such a craft, and hint that the builders of them have taken their plans from the models of the general style of lake boats.

In the steamboat—Colgate Hoyt is her name—Capt. McDougall has, however, presented a craft that shows improvement over the tow barges. The *Marine Review*, to which we are indebted for the accompanying cut and description, sent a representative to Duluth, Mr. Sprague, to prepare the drawing of her which accompanies this paper, and it is the first in print. The principal changes will be noticed in the house arrangements above deck. The hull is the same as the tow barges, excepting in the run aft, which is more steamship-like. It is claimed for her that she will carry about 2,600 net tons on 15 feet of water, and that with this draught her cabin deck will be 15 feet above water. She is 280 feet over all, 36 feet beam, and 22 feet moulded depth, and has Hodge engines and aft compound engines, with cylinders 26 and 50 inches by 42 inch stroke. The boilers, built by the Lake Erie

Boiler Works, of Buffalo, are 11½ feet long, allowed 150 pounds to the square inch.

The quarters for officers and crew are far better than might be expected, and are in many respects equal to anything on the lakes. The cabin rests on three turrets, supported on the sides by twelve ventilation pipes. Four of these ventilate the engine room, four perform the same duty for the fire hold, and four the cargo hold. The captain and officers will all have spacious quarters in the cabin above deck, which also contains a dining room. The different rooms are finished in oak and elegantly furnished. The wheelmen, firemen, and other members of the crew have quarters below deck, forward and aft, and the engine room is large and well lighted. In the turret forward is one of the American Ship Windlass Co.'s steam windlasses, with the capstan above. She has hand steering gear, with the shaft and hub of the steering wheel of brass, to avoid affecting the compass. On the port side of the cabin forward, just aft of the pilot house, there is also a chart room and office combined. Capt. Ed. Morton, of the Wilson fleet, will accompany Capt. C. H. Beach, who will be in command of the new boat, for one or two trips, and both masters declare she will show a surprising speed. She will have a Hodge wheel of coarse lead. The Colgate Hoyt may be expected down the river in a few days.—*Iron Trade Review* (Cleveland, O.)

A RECENT number of the New York *Independent* contains letters from a large number of the most prominent

railway officials of this country describing the rules of the several companies respecting the drinking habits of their employes. From these letters it appears that on nearly all first class railways it is against the rule for a man to take liquor while on duty. If a man is known to be intoxicated when off duty, he is liable to discharge. In general those men have the preference who are reputed to be non-drinkers.

THE late James Nasmyth, inventor of the steam hammer, left an estate which has been sworn as amounting to over \$1,200,000.