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had at the receiving house. It is discharged into the boot, carried up the leg, and spouted into the bins. This time, however, instead of one leg, there may be from sixteen to twenty; and the four bins will have increased to over one hundred. Our five thousand bushels of grain, then, are discharged by gravity from the bottom of the bin to the boot of an elevator, are lifted and discharged again into a big spout, through which they flow directly down into the hold of a lake cargo vessel moored alongside the elevator.

This vessel is of a special type which has been developed for the laketrade. Although she may be capable of carrying over ten thousand tons of cargo, she is nothing more nor less than a huge barge with straight, parallel sides; blunt of bow and stern; with accommodations for the seamen at the bow, and with engine, boilers, and captain's accommodations at the stern. The main body of the ship consists of one vast hold, access to which is gained by a long line of hatches. Our 5,000 bushels of grain together with hundreds of thousands of bushels that may have been gathered from half a dozen different centers in the wheat-growing districts of the West, now start on their long journey at ten or twelve knots an hour to Buffalo, being consigned to one of the great waterside elevators in that city. The vessel is moored alongside the elevator, with its hatches opposite a huge tower-like structure built against its side and extending a story higher than the rest of the building. Inside of the tower and swinging from a hinge at its top is a huge steel-and-timber structure, which is nothing more nor less than our old friend the belt elevator grown to Brodignagian proportions. Almost before the ship is alongside and the hatch covers are off, this swinging elevator is moved until its boot hangs directly over the opening into the hold. The boot is extended until it enters the hold and is buried deep in the mass of grain. The elevator leg is some 90 feet in length and it can be raised or lowered some 50 feet if necessary. In a single hour it can lift 15,000 bushels out of the hold and into the elevator.

As the grain reaches the head of the tower leg, it is shot directly into a receiving bin. Beneath this bin is a weighing scale with a hopper of 200 bushels capacity. The scales are set for a certain weight, and the weighing hopper is filled by pulling a lever which moves a slide in the bottom of the receiving bin above. The man who does the weighing is so expert that he can fill the scale hopper with the exact amount, no more nor less, once in every fifty seconds; which he must needs do when the huge marine leg is pumping grain out of the hold at the rate of 15,000 bushels per hour. From the weighing hopper the grain is delivered direct to the storage bin; or if, like our 5,000 bushels, it be destined for transportation across the sea, it will be carried across the building and out again as fast as the railway cars can be found to accommodate it. The cars will carry the grain direct to one of the great grain-exporting seaports, Portland, Boston, Newport News, or New York.

The method of operation at the seaport elevators is similar to that of the Chicago warehouse. The main difference is that, whereas at Chicago the barge steamer lay against the side of the elevator and the grain was delivered directly to the hold through the spout below the open door, it will frequently happen that the grain must be carried several hundred feet out over a pier and there discharged into the hold of the ocean-going steamship. This is done by means of a belt conveyer.

Now, this is not by any means the first time that our consignment of grain has made its acquaintance with the belt conveyer, which has been aptly described as the elevator leg belt stripped of its metal cups and lying upon its side. The belt conveyer is extensively used in the vari-

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Chicago & North Western Ry.



NEW PASSENGER TERMINAL, CHICAGO—Madison Street Entrance

THE PORTAL OF THE WEST

THE New Passenger Terminal of the Chicago and North Western Railway at Chicago is to be one of the finest monuments ever erected to the commercial life and spirit of the West.

It is to be located between Canal and Clinton Streets, extending from the main entrance fronting on Madison Street, over Washington and Randolph Streets to Lake Street.

More than \$20,000,000 is to be expended to provide a railway entrance to the city through which passenger traffic to and from the territory that has made Chicago powerful and rich is to move in ceaseless activity.

Work upon the new station is proceeding with all the rapidity that skill and liberal expenditure can command.

The new station will have a capacity for handling a quarter-million patrons daily.

It is confidently asserted that its provisions for doing this expeditiously and with the greatest comfort will excel anything ever known to the traveling public.

Almost 10,000 miles of railway are included in the marvelous system of the North Western Line. It reaches 2,000 active Western cities, towns and villages included in nine Western States, which are thus placed in immediate and vital touch with Chicago, the Great Central Market.

By traffic arrangements with its connecting lines practically every point west and northwest of Chicago is placed in direct touch with the city, by through passenger train service, and freight shipments are handled with precision and dispatch, consigned through to any one of 9,500 stations, located on 62,000 miles of railway, about one-eighth of the entire railway mileage of the whole world and one-fourth of the railway mileage of the United States.

The North Western Line is the pioneer line west and northwest of Chicago and the Only Double Track Railway between Chicago and the Missouri River. Its service includes

THE BEST OF EVERYTHING



All Agents sell tickets via this popular route. For tickets, rates and full information address

W. B. KNISKERN,

Passenger Traffic Manager, Chicago, Ill.

RECENTLY PATENTED INVENTIONS.

Pertaining to Apparel.

WAIST AND SKIRT SUPPORTER.—A. M. PRESTON, Broxton, Ga. The objects here are: to provide a supporter which is at once simple in construction, durable and certain in operation: to provide a device which will lie closely and snugly to the form; and to provide a device which is neat and presentable in appearance.

SELF-SUPPORTING STOCKING.—G. GRAHAM, New York, N. Y. The invention relates more particularly to the means employed for supporting a stocking. The upper portion of the stocking is so formed that it in itself constitutes a garter, so that no separate supporting means need be employed. The invention covers any fabric foot covering, as for instance, socks, hose, half-hose, etc.

Electrical Devices.

TROLLEY-POLE CATCHER.—J. H. WALKER, Lexington, Ky. The purpose in this case is to provide a construction in connection with the pole and a lower connection, whereby the pole may be prevented from rising to a perpendicular position when the trolley wheel jumps the wire, and whereby the pole may be held in any intermediate position and may be permitted to freely move in contact with the wire in the operation.

Of Interest to Farmers.

JOURNAL FOR AGRICULTURAL IMPLEMENTS.—A. C. DITMAR, Davenport, Wash. An efficient journal is provided which can be attached to a plow beam or the like for the purpose of revolvably mounting a colter disk or other part, in which the disk can be set at any angle, which will fit any kind of plow, in which the spindle is in a dust-proof boxing, and in which the wearing parts are supplied with lubricant.

ANIMAL COVER.—C. L. HASTINGS, Fond du Lac, Wis. The aim in this invention is to provide a durable cover, which is particularly useful for cattle, by means of which the animal can be well covered, when necessary, which thoroughly envelops the body, leaving the head, neck, and legs free, and in which means are provided to prevent the displacement of the blanket from the rear of the body.

Machines and Mechanical Devices.

FILLING DEVICE.—J. PAPISH, 605 Freeman Street, Valparaiso, Ind. The aim is to provide in this invention, a device by means of which powders, crystals or other granular material can be expeditiously and easily introduced into small-necked bottles and the like, which requires little effort to operate it, and which fills the receptacles without spilling any of the material which is being introduced into the receptacle.

Railways and Their Accessories.

DOOR.—C. B. WHITMAN, Watervliet, N. Y. This improvement in doors is especially designed to be used in connection with street railway cars, and has for its purpose to automatically register the number of passengers entering, and which will permit of the exit without operating the registering mechanism. The movements of the motorman on the platform will not be more restricted than when the usual type of door is employed.

NOTE.—Copies of any of these patents will be furnished by Munn & Co. for ten cents each. Please state the name of the patentee, title of the invention, and date of this paper.

INDEX OF INVENTIONS

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AND EACH BEARING THAT DATE

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