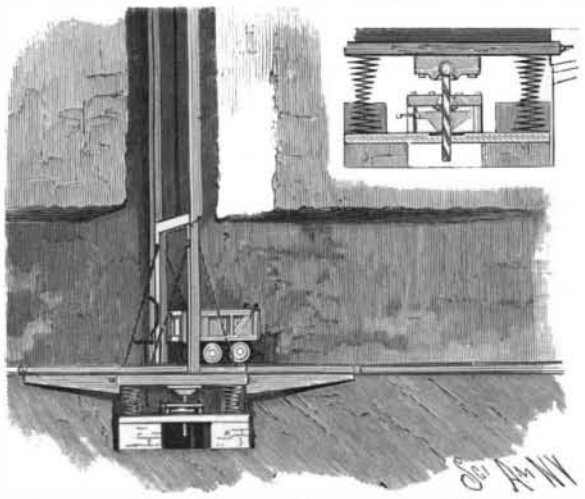
A STOP FOR ELEVATORS AND MINING SHAFTS.

The illustration represents a device adapted to stop the cages in elevator wells, mining shafts, etc., serving as a cushion to receive the descending cage, thus allowing the engineer to run it with greater speed and

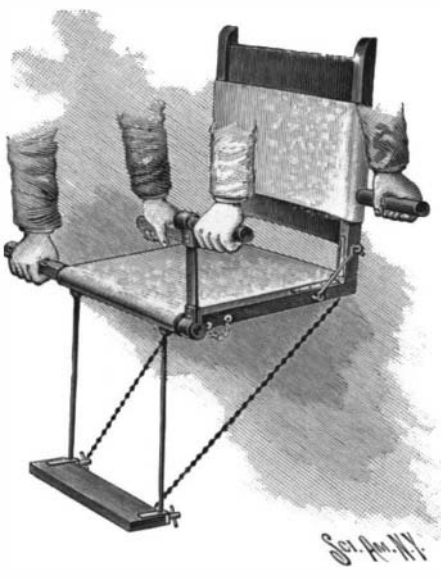


BELL & WILLIAMS' STOP FOR ELEVATORS AND MINING SHAFTS.

preventing damage to the cage from coming suddenly to the bottom. The improvement has been patented by Thomas Bell and John S. Williams, of Krebs, Indian Territory. The top striking platform is supported on springs resting on a suitably supported base plate, the downward movement of the striking plate being also limited by blocks on the base plate. Depending from the under side of the striking plate, and connected therewith by a ball joint, as shown in the sectional view, is a screw which extends through a support and through a ratchet wheel, a key in which engages the thread of the screw, so that the vertical movement of the screw turns the wheel, the screw also extending downward through a base plate and wear plate. The ratchet wheel is tapered on its under side to turn with but little friction when the plate and screw are depressed, but it turns with considerable friction when the plate is being lifted. The wheel is prevented from turning by a pawl fulcrumed on its under side, and the outer end of the pawl is pivoted to a connecting rod extending to the lower end of a lever, a spring-pressed extension of which extends into the path of the cage, whereby, as the cage ascends, the pawl will be automatically released, allowing the ratchet wheel to turn and the striking plate to rise. The locking of the stop device in its depressed condition holds the cage or car stationary while it is being unloaded or loaded.

A FOLDING INVALID CHAIR.

This very simple form of chair, to facilitate carrying invalids in upright position from one place to another, has been patented by Bernard E. Jamme (address in care of John Woolley, No. 111 Fifth Avenue, New York City). The invention consists principally of the handles at different heights on opposite sides of the chair, rendering it easier for two persons to carry up and down stairs and elsewhere an invalid seated in the chair. The chair may be placed upon the edge of a bed and the patient moved upon it or from it with the greatest ease, and when not in use it can be readily folded into a small, compact bundle.

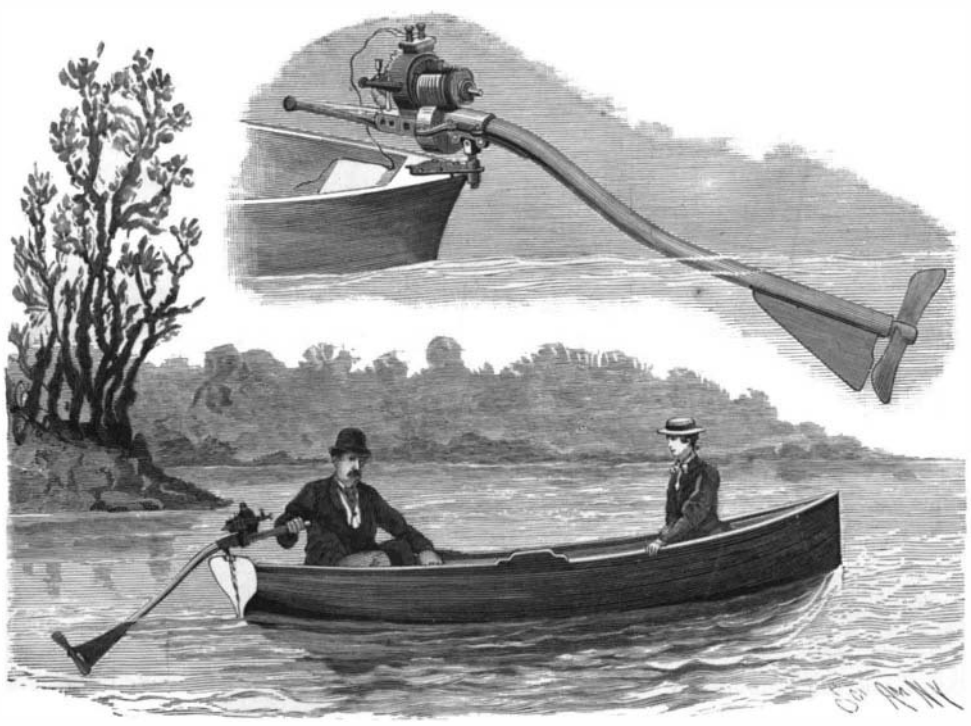


JAMME'S FOLDING INVALID CHAIR.

A PORTABLE ELECTRIC PROPELLER FOR BOATS.

Among the multitude of inventions that are offered to the public day by day there are some that commend themselves to the judgment at first sight, and fill off-hand a long-felt want. The electric boat propeller, as shown in the accompanying views, is surely one such invention as mentioned above. It has the accumulated advantages of being cheap, portable, compact, and thoroughly safe to the user. Briefly described, it consists of a movable tube which is hinged at the stern of the boat, much as an oar is used in sculling. The tube contains a flexible shaft formed of three coils of phosphor bronze. This tube extends down and out into the water, where it carries a propeller, and at the inboard end an electric motor is attached, which is itself driven by batteries. The rudder and the propeller are thus in one, and the steering properties of a boat so fitted would be very swift and powerful. The tube, with its inclosed flexible shaft, is partly filled with oil; and these parts are thus automatically and constantly lubricated. The rate of speed is from three to five miles per hour. The combined propeller, motor, and rudder weigh only 35 pounds for a 10 foot to 18 foot boat. The batteries weigh from 100 pounds to 275 pounds, but being in four parts are easily handled.

This very ingenious and effective invention will be gladly welcomed by the sea and river sportsman. Its handiness and noiselessness make it admirably adapted to duck shooting; and it will commend itself at once to the special needs of the fisherman. All sportsmen, at one time or another, when they have been following the windings of some narrow stream, or threading their way through the mazes of a rush-grown marsh, have wished for a means of propulsion of smaller compass than a pair of sculls, or even a canoe paddle. The electric propeller, working snugly in the wake of the boat, is admirably adapted for such work, or for any

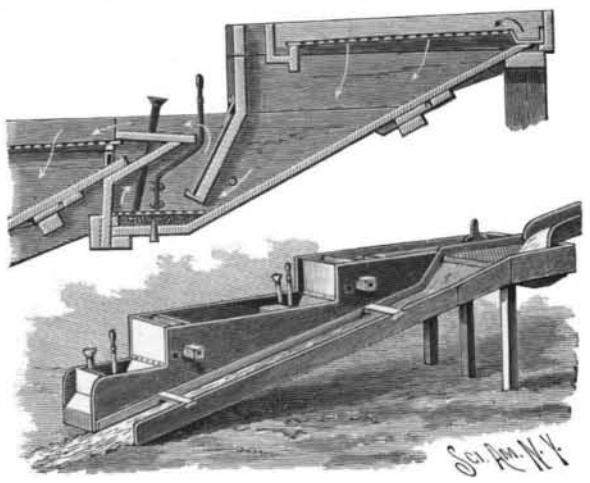


A PORTABLE ELECTRIC PROPELLER FOR BOATS.

circumstances where a boat has to be handled in a crowded wakeway. This handy device is manufactured by the Electric Boat Company, of 136 Liberty Street, New York City. The motor, propeller, and batteries can be purchased for $150, and the running expenses amount to only 5 cents per hour.

A GOLD SAVING APPARATUS.

The illustration represents, in sectional side elevation and in perspective, a gold saving apparatus designed to save nuggets, coarse gold, and flour gold, with but a small expenditure of water and labor. A patent has been granted for the improvement to Dennis G. Frisbie, Dayton, Wyoming. The hopper into which discharges the sluice box carrying water and gold-bearing sand from the placer mine or the quartz mill has a false bottom over which large rocks and other coarse tailings pass into a tailing chute, the gold, sand and water passing through the coarse perforations in the false bottom into a transverse channel leading into a nugget box in the upper end of a hopper, as shown in the sectional view. This hopper has a perforated bottom through which the gold-bearing sand and water pass to a settling tank with inclined bottom, there being a transverse passage at one end of the hopper into the tailing chute. At the lower end of the settling tank is a gold-retaining chamber, with a perforated false bottom under which is mercury, the bottom being preferably hung on an upwardly extending lever, which the operator shakes several times a day. The dividing partition between the chamber and the settling tank is inclined, and carries a removable copper plate adapted to take up any gold in the flow of the gold-bearing sand, as it passes over to a second hopper with perforated bottom and settling tank, with gold-retaining chamber at its lower end, the perforations or meshes of the second hopper being finer than those of the first. A pipe leading to the bottom of each gold-retaining chamber facilitates the introduction of a new supply of mercury when necessary. Any mercury



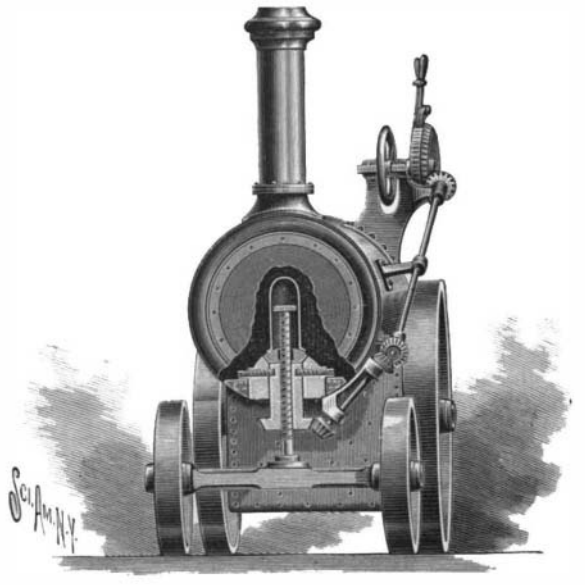
FRISBIE'S GOLD SAVING APPARATUS.

escaping from the quartz mill is readily caught and retained in this machine.

In a series of interesting experiments made to ascertain why trees are so frequently struck by lightning, it was demonstrated that the green wood is in all cases a bad conductor of electricity, and so much the worse in proportion as the tree is richer in oil. On the contrary, the green wood of such trees as are poor in oil conducts electricity relatively well. Living wood is a much better conductor than dead. The existence of dead branches in trees of both categories, therefore, increases the danger.

A BOILER LEVELING DEVICE.

An improvement by means of which portable boilers, traction engines, and similar machines may be conveniently brought to a horizontal position when standing on uneven ground, or traveling up or down a hill, is represented in the accompanying illustration, and has been patented by Willie C. Hancock, of Albany, Ky. An upwardly extending screw rod is fastened to the front axle, and on the rod is a revoluble nut in the under side of a block, the nut being held in place by set screws engaging an annular recess in the upper part of the nut. The block has on its sides trunnions journaled in the smoke box of the boiler, shown in the broken away portion of the engraving. The screw rod extends through the top of the block into a tubular extension or casing, to protect it from soot, etc. On the lower end of the revoluble nut is a beveled gear in mesh with a pinion on a short shaft whose other end has a bevel gear connection with a shaft extending up and back at one side of the boiler, the latter shaft having a bevel gear connection with a larger gear wheel with ratchet teeth engaged by a pawl on a lever fulcrumed on the shaft of the large gear wheel. By operating this lever, motion is communicated through the gear wheels and shafts to the revoluble nut, to raise the front end of the boiler, and to lower it the pawl is disengaged and the large gear wheel is oppositely turned by means of a handle, the weight of the boiler then assisting in rotating the nut.



HANCOCK'S BOILER LEVELING DEVICE.

The Earliest Transatlantic Steamships.

Samuel Ward Stanton contributes an interesting paper to Engineering Magazine for September, from which we take the following:

On May 29, 1819, while the little schooner Contract, Captain Livingstone, was sailing quietly along on the Atlantic, in latitude 27° 30′, longitude 70°, the lookout discovered what he supposed to be a vessel on fire, far off on the horizon. The Contract was headed toward the new comer, but, to the surprise of those on board, she passed along quickly and was soon lost to sight, notwithstanding all sail on the Contract was spread. The conclusion was then reached that the strange vessel was nothing more or less than a "steam packet," bound across the ocean.

The vessel in question was the Savannah, a ship of some 380 odd tons, and was bound to Liverpool from Savannah, having left the latter place on May 26. The Savannah was the first transatlantic steamship. She was built at Corlaer's Hook, on the East River, now part of New York City, by Messrs. Crocker & Fickett, and was at first intended for a sailing packet, but before she was finished was purchased by William Scarborough and others of Savannah, Ga., and machinery was placed in her. The engine—inclined direct-acting—was built by James P. Allaire, and the boilers by Daniel Dodge. The paddle wheels were so constructed that they could be taken apart with little trouble and placed on deck should occasion arise, the shaft having joints for that purpose. Skeleton frames of iron designed to surround the wheels, and covered with canvas, served for wheel houses. The Savannah's arrival at Liverpool created a small sensation; steaming up the harbor, with sails furled, a full head of steam on, and the American flag floating proudly over her, she no doubt presented an inspiring sight. The trip had occupied 22 days, on 14 of which steam was used. Leaving Liverpool, the Savannah sailed to St. Petersburg, stopping once or twice on the way, and finally returned to Savannah. The machinery was afterward taken out, and she plied as a sailing packet between New York and Savannah. She was finally wrecked on the Long Island coast.

Soon after the Savannah made her successful ocean trip, a fine large steamer, named Robert Fulton, of 750 tons, was constructed in New York by Henry Eckford, for the route from New York to Cuba and New Orleans. She was a stanch vessel, constructed "entirely of oak, locust, and cedar, and Georgia pine, copper fastened." She had a square, or crosshead, engine, of the type then in use on inland steamers; there were two boilers and two funnels. She left New York for New Orleans on her first trip April 25, 1820, stopping en route at Charleston and Havana. She was an entire success, and covered the 2,225 miles between New York and New Orleans in an average of 10 days. The New York Evening Post of June 15, 1820, contained the following notice of her arrival:

"The beautiful steamship Robert Fulton, Captain John Mott, arrived last evening, 17 days from New Orleans, via Havana and Charleston. At Havana she stopped 2 and at Charleston 4 days. She has aboard between sixty and seventy passengers, and has been at sea only 10 days."

In another notice, on the return of this boat in January, 1821, the Post said:

"Steamship Robert Fulton, Captain Mott, arrived in New York in 8 days from Charleston, having been to New Orleans, . . . 54 days' round trip to New Orleans, averaging 14½ either way. . . . The boisterous season, the rough and heavy weather which she has experienced this trip, must convince even the most incredulous of the perfect practicability of navigating the ocean by steam. Captain Mott gives her a decided preference over every vessel he ever commanded, both for safety and pleasantness during a gale of wind."

The Robert Fulton ran for three years very successfully; she was then sold to the Brazilian government, to be used as a cruiser, her machinery being removed.

Various small coastwise lines were in operation both in the United States and Great Britain between 1825 and 1835. In 1825 the steamship Enterprise made the trip from England to Calcutta, and it is said that her commander, Captain Johnson, received $50,000 for taking her out. She was of 470 tons burden—smaller than the Robert Fulton, but larger than the Savannah—and sailed from Falmouth August 16, 1825. Like the Savannah, her engine was only worked when the weather was fine, it being used 64 out of the 103 days required to perform the passage.

A steamer of 350 tons, called the Curacoa, built in England for a company of merchants of Amsterdam and Rotterdam, ran between Amsterdam and the Dutch West Indies for some time in the later twenties. The Meteor, a British steamship, ran between England and the Mediterranean in 1830; she carried the mails.

Following the Savannah, the next steamer to cross the Atlantic was the Royal William, a 363 ton ship, constructed in Quebec. She made the run from Quebec to London in something over 40 days, leaving August 5, 1833, and reaching Gravesend September 16.

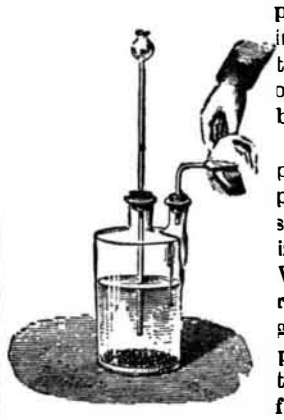
One of the most famous of the early steamships was the Sirius, a small, but stanch, vessel that was sent from Queenstown to New York by the British and North American Steam Navigation Company on a regular line that had just been established. She left on her voyage to New York on April 5, 1838, with forty-six passengers, and reached her destination April 23. Later in the same day the steamship Great Western arrived from England, and the appearance of these vessels in the harbor caused great excitement in New York. The Great Western has left Bristol on April 7, thus making the passage in 15½ days as against the 17 of the Sirius. The Sirius had originally been built for coastwise service in England, but had been chartered in order to anticipate the Great Western, which was about ready to sail on her first trip. The Sirius made two round trips in the line, and was then placed on the route between Dublin and Cork, where she continued plying until January 16, 1847, when she was wrecked. The British Queen, newly built, took the place of the Sirius when she left the transatlantic route.

AN EXPERIMENT WITH HYDROGEN SULPHIDE.

BY GUSTAVE MICHAUD, D.S.

Here is a curious experiment, which can be performed with hydrogen sulphide.

If any colored flower is passed quickly through the flame of that gas, it becomes instantly as white as snow in all the parts that were in contact with the flame. The flower is not carbonized and does not fade. The cause of this phenomenon is, of course, that sulphur dioxide is evolved during the combustion of the hydrogen sulphide, but while it takes several minutes to bleach flowers in the ready made gas, its action is absolutely instantaneous when applied as stated above. Moreover, the flame acts merely on the part of the flower which is in immediate contact with it, so that odd figures can be drawn on the petals, as if with a brush and white paint.



Made in the flame of sulphur in combustion this experiment gives a negative result. The flowers are carbonized before being bleached. With carbon bisulphide the result is better, but not so good as with hydrogen sulphide. This difference of action may be explained by the fact that the gas evolved during the combustion of hydrogen sulphide is probably, for a moment, sulphurous acid SO_2H_2, and not sulphur dioxide SO_2.

Young readers, willing to repeat this experiment, will find in text books of chemistry how to prepare hydrogen sulphide and how to avert the two dangers of this preparation, viz., the explosion of the flask by premature lighting and the inhalation of the gas while it is not burning.

Women Jewelers.

Whatever may be woman's future in the arts, there is no doubt that the wife or daughter of the jeweler, country jeweler especially, may become, and ought to be, an invaluable assistant to him, not alone in his capacity as storekeeper, but as mechanic as well. So far, saleswoman duties have satisfied unaroused female ambition, only because it has been unaroused. There is no reason why the jeweler with a family should not educate one of his daughters as a jeweler proper, nor is there any reason why, when taught, she should not prove an adept at the art and an acquisition to the store. He could teach her, for instance, the art of engraving, for which her feminine instincts, fineness of fancy, and copiousness of patience peculiarly suit her. He could teach her, in a word, how to perform the numerous tedious tasks in a jeweler's and watchmaker's work in the performance of which application or delicacy of touch, both feminine characteristics, may be either a need or an advantage. Did she develop unusual talent, the transition would be easy to the more remunerative branch of setting precious stones and designing patterns. Curiously enough, women have so far cast no envious eye on this well-paid, steady, most interesting, and dignified calling. At a glance one can appreciate that its requirements are many and severe. A careful course of apprenticeship in order to gain the mechanical skill, an artistic sense to guide, a firm and delicate hand to execute, are some of the elements necessary to success as a worker in precious stones and metals. Yet many jewelers' daughters endowed with just such qualities throw away their cleverness on fancy work, and exhaust their eyesight over a needle, when, as designers of jewel patterns, or as lapidaries, a good fixed salary might be secured.—Keystone.

THE mayor of St. Petersburg has ordered the name of every individual who is found drunk to be posted in specific public places and printed in the Official Gazette. A good idea.

Correspondence.

The Proposed Cape Cod Canal.

To the Editor of the SCIENTIFIC AMERICAN:

I am glad to see that the SCIENTIFIC AMERICAN is awake to the importance of ship canals, supplementing the generous provision that nature has made for sheltered coastwise navigation almost from Maine to Florida. Thoughtful persons have often execrated the policy that has led our legislators to vote millions of the people's money for the improvement of unheard-of creeks (see river and harbor bills) when such a peninsula as Cap Cod lay awaiting for a short straight ditch to be digged, separating it from the mainland and cutting off something like 60 miles of dangerous, intricate navigation through Vineyard Sound and around Nantucket Shoals. In point of fact, Charles the Second was King and William of Orange was fighting the French in Flanders when the Cape Cod Canal began to be talked about in Eastern New England, and from that day to this the subject has been periodically agitated only to fall into the hands of speculators and die a succession of natural deaths.

Your paper of August 31, so far as it refers to the Cape Cod section of the canal project, favors what is known as the Bass River route. The earlier surveys, including one made in 1776, by an engineer named Machin, under authority of George Washington, contemplated the shorter and more direct line via Buzzard's Bay and the Sandwich Isthmus, and one has only to consult the United States Coast Survey charts, or indeed any map of New England, to perceive at a glance how unanswerable are the arguments in favor of that route. A government survey was made in 1860 and a special chart (No. 3042) was issued by the Coast Survey showing the proposed canal in detail. There are some reasons why the Bass River route is preferable for sailing vessels, but this is the age of steam, and whether for commerce or war, steam is the agent that must be considered. Personally I have little doubt that both canals will eventually be built, but if the decision is left to a competent board of engineers, as no doubt it will be, should the government take the matter up, there is small room for question as to which route will be chosen first.

CHARLES LEDYARD NORTON.

Sandwich, Mass.

The Seattle and Lake Washington Canal.

The citizens of Seattle, Wash., are jubilant over the beginning of work on a canal which is to connect the Puget Sound with the fresh water lake, Lake Washington. The Gas Light Journal says: "The work, which has been undertaken by the Seattle and Lake Washington Waterway Company, includes the excavation of two waterways, each about 1 mile long and 1,000 feet wide, from deep water through the tide flats of Elliott Bay; two Duwamish waterways connecting the east and west waterways with the mouth of the west channel of the Duwamish River; a canal waterway about 1 mile long and 218 feet wide at low water from the head of the east waterway through the flats eastward to the shore line; a canal through the upland 80 feet wide at the bottom, in a direct line nearly 2 miles to Lake Washington, into which it will open in Wetmore Slough; and the filling to a level of 2 feet above high tide of 1,525 acres of tide land with the excavated material. The two main waterways and the canal waterway are to be excavated to a depth of 26 feet at low tide, the canal itself to a depth of 30 feet at dead low water in the lake, and the Duwamish waterways to a depth of 12 feet at low tide. The amount of material to be excavated is 36,000,000 cubic yards, just about enough to do the filling required.

"While the east and west waterways will be 1,000 feet wide, according to the official map of the State Land Commissioners, the space clear for traffic will be only 552 feet between the pier head lines, the remaining 448 feet being allowed for the extension of wharves and slips to such lengths as to accommodate the largest ocean steamers. The construction of waterways on this plan, which would open wharves and slips instead of docks and tidal basins, is in accordance with the most modern ideas of harbor improvements, the revolution in ocean traffic wrought by the use of steamers instead of sailing vessels, the carrying on of land transportation by railroad and the use of machinery for loading and unloading ships having combined to make dispatch in handling cargoes at the same time necessary and possible. Thus the old system of floating a ship into a dock through tidal gates and unloading its cargo on trucks has almost been done away with. Trains are now run right alongside a ship at the wharf and the cargo is transferred from one to the other almost without the touch of a man's hand. With the provision made in the tide land plat for railroad tracks on every wharf and for steamers to run into the slips alongside the tracks, Seattle will have facilities on her waterways for carrying on ocean commerce with speed and economy equal to those of the greatest and most modern ports of America and Europe."