

codeggs from New York to Washington, and said that it was intended to have the steamer Fish Hawk, with its appliances for hatching, sent here, and offered, if this was done, to furnish 100,000,000 eggs per diem for hatching purposes. This could easily be done, in his opinion, as a large cod will strip 9,000,000 good eggs. This method will save the expense of sending out a special steamer to catch fish with ripe eggs, and will save a great waste of both fish and eggs.

Professor C. W. Smiley, of the Smithsonian Institution, read an important paper comparing the statistics gathered by the United States Commission in 1871 and those gathered in 1879 for the census statistics. The total number of pounds catch reported in 1872, with four large points wanting, was 42,350,000 pounds. Making a fair estimate for missing ports, the total catch was 50,009,000 pounds. During the year 1879 the total catch was 68,742,000 pounds, which was probably smaller than in the intervening years. The greatest decline in the catches was shown in returns from the ports of Buffalo and Cleveland, and the greatest increase in the returns at Chicago, where, in 1872, the catch marketed was 7,462,150 pounds, and in 1879, 17,247,570 pounds. As fishermen have more effective apparatus for capture than formerly, and the lakes are more thoroughly and exhaustively fished than before, the slight increase in the catch during the decade virtually means a decrease in the quantity of fish, and that a gradual depopulation is following the introduction of small meshed nets and the use of steamers. In support of this theory Prof. Smiley gave a large number of statistics showing the gradual but certain extermination of the whitefish and salmon trout. This was due in part to the fact that there were enough nets used in Lake Michigan alone to reach, if stretched in a continuous line, from one end of the lake to the other. The whitefish now caught are rarely ever large enough to rate higher than No. 3, and no fish large enough to rate as Nos. 1 and 2 are ever caught. Old fishing places once fairly alive with fish are now exhausted and deserted by the fishermen to superannuated Indians and gulls. Another cause for the disappearance of the fish is the prevalence of quantities of sawdust near the mouths of rivers, which destroys the fish. In Lake Erie, though whitefish and trout have decreased, the quantity of bass, pike, and sisco has increased since alewives were introduced.

The Secretary read a paper by Seth Green on the hatching of sturgeon and striped bass, in which he insisted that the artificial propagation of these fish was necessary to keep them from extermination. The chief enemy to the sturgeon is the eel, which, when the female sturgeon is ripe and ready to deposit her spawn, often enters the vent and remains there until it has stripped her of all herova. As a remedy against this evil he recommends the placing of the fish in a car, and placing about it a harness of some kind that will prevent the eel from entering her and destroying the spawn. With such apparatus and properly protected waters in which to further breeding, he is of opinion that sturgeon may be successfully propagated. He has succeeded in hatching out in his shad-hatching boxes 155,000 sturgeon fry, which experiment he offered in proof of his claim. The striped bass he thinks can, by the use of racks or slides, be caught in a sufficiently ripe condition for use in artificial propagation in Southern waters.

Mr. Blackford read a letter from S. M. Johnson, of Boston, urging the more strenuous enforcement of the laws against the sale of small lobsters; and a resolution was adopted instructing the officers of the association to forward to Albany a request for an increase of the number of game constables for the purpose.

The Secretary read a paper by Prof. John A. Ryder on oysters, treating particularly of the possibilities and probabilities of the artificial propagation of this toothsome bivalve. The view taken was not hopeful, as the methods employed had failed to keep an embryo oyster alive more than a week. The trouble seems to be that the experimenters are working on an entirely impractical plan, based on an erroneous theory as to the conditions of the problem.

The migration of shad, the recurring failure of the Canadian salmon fisheries, the food value of the sword fish, and kindred topics were among the other subjects discussed.

The officers elected for the ensuing year are: President—George Shepard Page, New York; Vice President—James Benkart, New York; Treasurer—Eugene G. Blackford, New York; Corresponding Secretary—Barnet Phillips, Brooklyn; Recording Secretary—James Annin, Jr., Caledonia, N. Y.; Executive Committee—Fred Mather, New York city; G. Brown Goode, Washington, D. C.; Seth Weeks, Pennsylvania; Benjamin W. West, New York city; T. B. Ferguson, Washington, D. C.; C. B. Everts, Vermont; and William M. Hudson, Connecticut.

The association adjourned to meet in Boston on the first Wednesday and Thursday of September next, at which time an effort will be made to have Prof. Baird call a meeting of the Fish Commissioners of all the States in the Union to meet in conjunction with the fish culturists.

#### LOCOMOTIVES AND MALARIA.

Dr. Wm. S. King, Surgeon United States Army, claims that the frequent movement of railway trains tends to diminish or prevent malarial diseases in localities where all the necessary conditions for the development of malarial effects seem to be present. His theory is that the heated locomotives, by continually passing through the infected districts, rarefy the air, and create a constant atmospheric disturbance by inducing warm upward currents, such currents acting,

with the pure air which rushes in from all directions, as agents in the dispersion or annihilation of the miasmatic influence.

Dr. King's theory would appear to be based upon information received in West Philadelphia while selecting a place of residence for his family in a locality adjacent to the Schuylkill River, where, notwithstanding the nearness of low lands, the residents claimed to enjoy immunity from malarial affections.

It is popularly believed that there are many places where the same profession is made by residents and land agents, and yet new-comers are apt to have their confidence in the value of interested testimony severely shaken out of them in the course of a year or two.

Perhaps a more extended observation of railway centers may lead Dr. King to modify his theory. The atmosphere of the lower levels of Jersey City, for example, is agitated by passing trains to a degree perhaps unrivaled in any corresponding area; yet, to speak within bounds, malarial diseases are not unknown on that side of the river; nor do our sanitary authorities report any signal diminution of malarial troubles among the residents of Harlem flats since steam roads were put upon the avenues and locomotives began to stir the air incessantly.

The circumstance that locomotive engineers and firemen are not exempt from ague and other malarial afflictions may not militate against Dr. King's theory, for trainmen do not spend quite all their time on the road; but how would he explain the fact that the extension of malarial diseases, their invasion of new districts, is so apt to be along the lines of railways? Is it because the trains on new roads do not run with sufficient frequency?

#### M. Poitevin.

Louis Alphonse Poitevin was born at Conflans, in the department of the Sarthe, in 1819. The earlier portion of his education was obtained at the neighboring town of St. Calais, whence he proceeded to the *Ecole Centrale* in Paris. During his course in this establishment he devoted himself almost entirely to chemistry and mechanical studies, and passed out of the school in 1843 with the diploma of civil engineer. His first official appointment was that of chemist to the *Salines Nationales de l'Est*, in which capacity he introduced many improvements in the manufacture of salt, while his mechanical knowledge enabled him also to introduce new forms of apparatus and machinery, he also made improvements in the processes of manufacture of bleaching powder (hypochlorite of lime), salts of potash, magnesia, as well as sulphuric acid.

When photography came upon the world as a scientific curiosity Poitevin's *penchant* for chemistry led him to experiment in this new direction, and we find him in 1848 publishing the fact that it was possible to produce an electro deposit of copper upon the whites of the daguerreotype image. His experiments in this direction led to the discovery of a method of photo-chemical engraving upon metallic plates coated with silver or gold, for which he received the silver medal of the *Société d'Encouragement des Arts*.

Subsequent to this he turned his attention to the study of the action of light upon bichromated gelatine, in which principle he recognized the possibilities of great achievements. He first applied himself to the production of moulds in relief, and patented, in 1855, his helio-plastic process—a description of which is to be found in our volume for that year. This consisted simply in preparing a film of gelatine of greater or less thickness according to the depth of the relief required, which, after sensitizing by means of potassium bichromate, was exposed to light under a negative. It was subsequently treated with cold water, when the portions unacted on by light swelled up and so formed an image in relief, from which a mould in plaster or other suitable material could be taken.

His next achievement was the fatty ink process, of which he may be said to have been the father. This was based upon his discovery that the surface of the bichromated gelatine film after exposure to light became repellent of water, though it permitted a greasy ink to adhere; and in 1855 or 1856 he established an *atelier* for working this and the photolithographic processes. This venture did not, however, prove a great success, and he was compelled to relinquish it to M. Lemerier, who, with various modern improvements and extensions, still carries on the establishment.

In 1862, having for some time past devoted his attention to the so called carbon process, he published his new method of printing upon paper in pigmented gelatine, and this method no doubt forms the starting point of the now perfected process of carbon printing, or autotype. For this and his labors in connection with photolithography he was awarded the prize offered by the Duc de Luynes. He also published researches in connection with the action of light upon various salts of iron, and devised the first "dusting-on" process, which was based upon the hygroscopic properties of a mixture of tartaric acid and perchloride of iron.

At the Paris Exposition Internationale of 1878, M. Poitevin was named *Collaborateur Universel*, and was adjudged an honorarium of 7,000 francs and a gold medal in recognition of his services in the advancement of photography. This sum was, however, never paid.

For many years past M. Poitevin had retired from active participation in the advancement of photography, though he still retained his interest in that as well as other branches of chemistry and science. Having settled at his native

place, Conflans, he preferred to spend his latter days in that leisure which his active life so justly entitled him to; and it was there he passed away, March 4, 1882, mourned by a large circle of affectionate relatives. His death removes from the ranks of photography one of the few remaining historic names.—*Brit. Jour. of Photography*.

#### FOODS FOR INFANTS AND INVALIDS.

It may be questioned whether there is any subject which comes more closely home to people of all classes than the character of the food supplies specially provided for infants and invalids. The increasing demand for this class of preparations (due partly to an actual need, but chiefly, we suspect, to the skillful advertising of manufacturers and the liberal margin of profit they offer to the retail trade), has led to a great number and variety of such competitors for public favor. Put up in ornamental boxes, they appear on the counters of every grocer and in the show cases of every apothecary shop; and not unfrequently their actual value is in inverse ratio to the pretentiousness of the package and the price.

As a rule, purchasers are obliged to take the virtue of such articles upon trust, few having the means or the knowledge requisite for an analysis, microscopic or chemical, of the preparations which they are advised to try, perhaps by the family physician, and yet a mistake in this connection may be fatal.

For all young infants, and for adults in many cases of sickness, starch food is injurious: sometimes in being a source of intestinal irritation; sometimes, as in the case of very young children, in furnishing a semblance of aliment without the reality, such children being as unable to digest and assimilate starch as sand. Hence the usual claim with respect to prepared foods of the cereal class is that they are free from or contain very little starch, while they are rich in gluten and other food elements capable of nourishing the sick and the young. To discover how far these claims are well founded, Dr. Ephraim Cutter, of Harvard College and the University of Pennsylvania, has lately made microscopic examinations of something like forty cereal foods, developing facts of the highest importance to physicians and their patients as well as to parents having young children. The results of his investigation appear, with numerous illustrations, in the SUPPLEMENT for this week. The article (which, by courtesy of Dr. E. S. Gaillard, we reprint from the *American Medical Weekly*) is worthy of study by all who are interested in microscopy or in the nourishment of invalids and children.

#### A Precocious Picklock.

On April 5 a twelve year old black boy, named Coleman, was brought before the United States Commissioner at Baltimore, Md., charged with robbing the private letter boxes in the city post office.

The locks on these boxes are of a kind supposed to be proof against picking, and the authorities could not believe the little rascal's admission of guilt. So the marshal of police and the assistant postmaster took the little fellow to the post office, where he gave them an exhibition of his skill in opening burglar-proof locks. He had a little strip of wrought iron which he had hammered very thin, and, putting this in the keyhole of a box and giving it one or two slight taps with his finger, open flew the box as if by magic. Box after box he opened in the same way.

Among locksmiths of Baltimore the case has excited, it is said, the widest interest, and the discovery that these locks can be picked may lead to an entire change in them. Government experts are already studying the case. The boy Coleman was sent to jail by the commissioner to await the action of the grand jury on his case.

Now would appear to be a good time for some inventor to bring out an unpickable lock suitable for post office use.

SIR CHARLES WYVILLE THOMSON died on the 12th of March, at the age of fifty-two. He was born at Bousyde, Linlithgowshire, on the 5th of March, 1830. His exploring expeditions in the Lightning, Porcupine, and Challenger, in which the "depths of the sea" in the Atlantic and around the world were investigated with remarkable success and multitudes of new discoveries, have made his name familiar to the people of all civilized lands. The publications of his last expedition are still in progress. After graduating at the University of Edinburgh, he was appointed, in 1850, Lecturer on Botany in King's College, Aberdeen, and, in 1870, Regius Professor of Natural History in the University of Edinburgh. His so early departure is greatly to be deplored.

#### The Tobacco Plug Patent Declared Invalid.

The United States Circuit Court of Kentucky, Judge Baxter presiding, has declared invalid the reissued patent of Miller & Worley, 8,060, January 29, 1878. This patent was for the idea of stamping letters or other marks by pressure into the side of the plug of tobacco. Instead of the usual plain plug, the inventor produced a plug marked with the maker's stamp or other ornamentation. This patent was considered to be of great value; but the court declares it to be invalid on the ground that Miller was not the original and first inventor. The testimony showed that Edward F. Smith invented and worked the same thing in 1875.

**Heavy Keel for a Small Yacht.**

A thirty-three ton lead keel was cast, March 30, by Mr. Henry Pipegras, of Brooklyn, for a cutter which he is building for Mr. Archibald Rogers, of the Seawanhaka Yacht Club. The heaviest keel previously cast in this country was for the cutter Oriva, and weighed twelve tons. The heaviest cast in England is said to be that of the sloop Valkyr, weighing twenty-four tons.

The casting of the keel was performed in the following manner: The oak keel was turned upside down, and a wooden mould constructed upon it of the exact size and shape of the proposed keel of lead. Then two furnaces of brick were constructed alongside of it, which sustained the pots in which the lead was melted, these pots being sufficiently elevated to allow the lead to flow from their bottoms into the mould. The two pots were needed in this instance, because of a doubt whether the melted lead would flow freely for the full length of the mould, about thirty-five feet. It is necessary that the melted lead shall be only raised to a temperature high enough to permit of its free flow, as, if it is made too hot, there is danger of its burning the wood. It was therefore necessary, after liquefying the first lead thrown into the pots, to cool the mass by constantly adding pigs of solid lead. The desired shape being that of a rocker, the ends of the mould would of course fill first, and unless restrained would overflow. Men were stationed along the whole length of the proposed keel, with pieces of heavy plank, ready to spike them on as soon as the lead reached the top of the mould. So promptly was this done that scarcely a particle of the molten metal overflowed until the extreme top of the arch was reached and filled. Mr. Pipegras will soon cast the keel of another cutter, to weigh twenty-one tons. In casing keels heretofore the bolts were first placed in position through the wooden keel, and the lead run in around them, but it was found that, as the lead cooled, it shrank away from the bolts and made the job an imperfect one. The plan followed by Mr. Pipegras is to bore the holes for the bolts through wood and lead together after the casting; then to drive the bolts and secure them with nuts and plates on top of the keel. The keel is then turned over and the work of fitting the frames goes on.

**An Arctic Ocean Cable.**

The project of connecting Europe and America by telegraph cables passing over Greenland, Iceland, and the Färöe Islands, entertained as far back as 1853, is again revived. At a recent meeting of the Danish Geographical Society, Mr. E. L. Madsen, an eminent telegraph statistician, read an interesting paper on the subject. The scheme of Mr. Madsen differs from that devised by Colonel Taliaferro P. Shaffner, who was the first to propose a North Atlantic cable, inasmuch as the line from the Färöe Islands to Norway was abandoned, the far shorter and more important line to Scotland, and another from Scotland to Norway, being substituted. Further, he would use almost exclusively submarine cables, while Shaffner in his plan included as many overland lines as possible. The essential reasons for avoiding long overland lines were the difficulty in keeping them in working order in the desert and impassable regions of Labrador, Iceland, and the Färöe Islands, and again the frequent appearance of the aurora borealis. Mr. Madsen explained that his landing places were selected so as to protect the cable against the waves of the ocean. At Iceland he would land it twenty miles south of Reykjavik, running it underground to that city. Thence it is to go south of Cape Farewell to Julianshope, Greenland. Quebec would be the American terminus of the North Atlantic cable, whence connections would be established with all American telegraph lines.

**MISCELLANEOUS INVENTIONS.**

A novel cattle car, patented by Mr. John G. Klett, of Brooklyn, N. Y., is provided with standards on which gates are hung, having at the top and bottom spring latches fitting in apertures in the top and bottom of the car, whereby the gates can be locked at any desired inclination to form stalls for the animals. The standards are connected by transverse bars carrying hay racks and a water pipe, and also carrying longitudinal rails on which troughs slide.

Mr. Martin Sedlacek, of Troy, Mo., has patented an im-

provement in riding saddletrees. This saddletree is made of two or more thicknesses of leather moulded into the form of a saddle and secured together, and provided with the front stay, inserted and secured between the layers of the leather.

A novel double acting bellows for milk aerators has been patented by Mr. Norman G. Stebbins, of Rome, N. Y. This is a device by means of which a continuous current of air may be forced into and through a body of milk for cooling the milk and for driving off the animal odors. The invention consists of double-acting bellows formed with a chambered central partition, into which, through valved openings, air from both chambers of the bellows is forced, and from thence, through a suitable conduit, into the body of the milk.

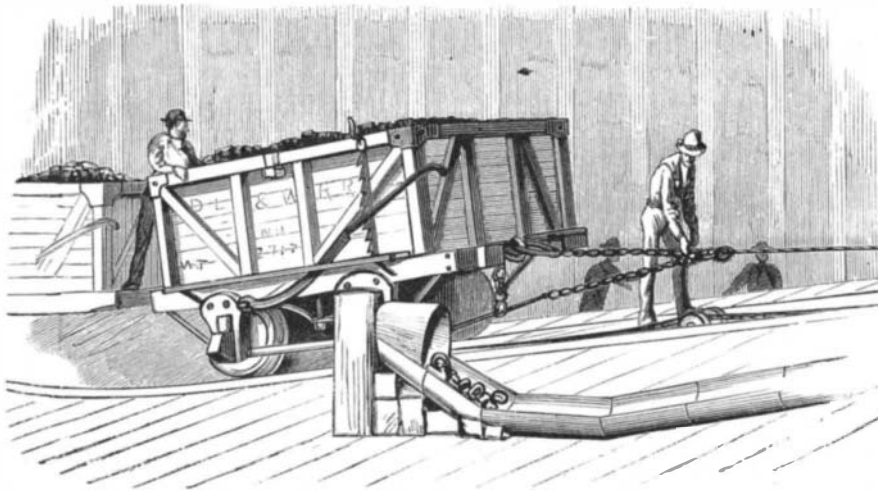


Fig. 4.—CONNECTING WITH THE CABLE SYSTEM.

A combined blacking-box holder and foot rest has been patented by Mr. Jacob Rees, of Cleveland, Ohio. This invention consists in hinging the blacking-box holder under the foot rest, and in constructing the foot rest and cover of the box holder, and combining the same in such manner that the cover will be automatically opened and closed upon the withdrawal of the box holder from and returning it under the foot rest.

An improvement in ornamental chains has been patented by Mr. Salomon Davidson, of New York city. This invention relates to links of ornamental chains, which have heretofore been made by the combination of interlaced rings or loops covered by tubing and bands of ornamental character, the general object of such construction being to dispense with the use of solder for connecting the parts. This invention consists in a cap or band applied as a finish or ornament to the ends of the links and retained in place by a shoulder on the cap.

**THE GRAVITY COAL PIERS AT HOBOKEN.**

Among the peculiar conditions of the enormous traffic in coal carried on at this port there are two which are chiefly instrumental in determining how the work must be done.

The quantity of the material delivered in any unit of time is comparatively very great; and the value of the coal, compared in bulk or weight with other commodities, is very small. Hence the necessity of employing broad, cheap, and rapid methods of handling large quantities at once, with the least outlay of mechanical power and manual skill.

A typical illustration of the means which have been devised for meeting the larger necessities of this great traffic may be found in the docks and piers of the Delaware, Lackawanna, and Western Railroad Co., at Hoboken. This corporation, as our readers are aware, is one of the half dozen great coal mining and transporting companies of the country. The Eastern or New York terminus of its road lies just south of Ferry street, Hoboken, occupying a large block of the made land which covers what was once a broad shallow bay between the Hoboken ferry landing and the slips of Jersey City ferry. The property outside the old shore line comprises eighty-five acres, and is divided about midway by a basin or lock, running back to near the line of the original shore, something over half a mile from the present river front. South of this basin lie the tracks, piers, wharves, and docks used in the coal traffic. A fair idea of the extent of these appliances for the delivery of coal may be obtained from an inspection of the larger illustrations herewith. The method of handling the coal, or, to speak more exactly, of delivering it without handling it, will need perhaps a more extended description. Standing at the point of view

of Fig. 2, and looking riverward over the sea of coal cars, some full, some empty; some moving, some at rest; and, whether rolling toward the delivery piers or returning empty, nearly all pursuing their course unattended and for the most part without visible means of propulsion, it is hard to realize that the vast movement is under perfect control, and with all its seeming complication is in reality very simple.

A little closer inspection will discover that the grade of all the tracks carrying loaded cars descends slightly toward the river, so that the long trains are, as it were, eagerly pushing riverward for deliverance, urged on by their own gravity. At the further end of the line car after car is seen to leave the press and (still without visible means of propulsion) to climb the steep grade to the top of the elevated pier and then roll forward along the higher level to the point of discharge.

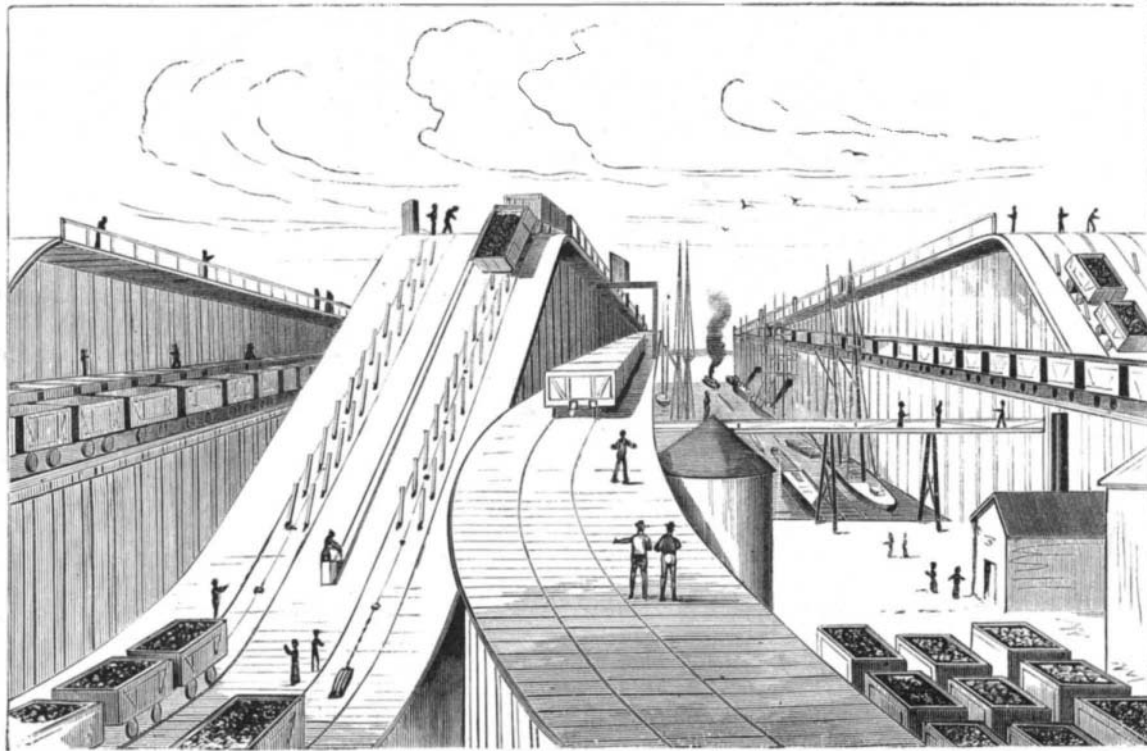
We change our point of view to the foot of the slope. Here we find a weighing shed and an engine house, in which is a stationary engine operating a cable system by means of which the cars are hauled one by one up the slope to the top of the pier. The hitching of the car to the cable, and, after weighing, its passage up the slope, are shown in Figs. 3, 4, and 5.

We climb to the top of the pier, some sixty feet or so above the water. The pier carries four tracks, two descending at a slight grade toward the river end of the pier; and other two (for the return of empty cars shoreward) descending from the river end toward the original starting point over half a mile inland, the viaducts for return passing at an easy grade far to the rear of the foot of the more steeply ascending slopes.

From the top of the ascending slope the pier extends a thousand feet into the Hudson, flanked on both sides by docks, in each of which float a varied fleet of canal boats, barges, schooners, square rigged vessels, and other ship

ping, receiving coal or waiting their turn to haul alongside the delivering chutes for the reception of a cargo. From forty to fifty vessels find berth room in each of the docks between the five coal wharves, and perhaps as many as in all of them together in the long basin first mentioned.

As soon as a place is vacant at one of the chutes the brakes are loosened on three or four cars, and they move forward, as of their own volition, to the openings over the place of discharge, where they are arrested by an application of the brakes. The car has scarcely come to rest before two workmen attack the lock which holds its movable bottom in place. A sharp blow or two upon the fastening, a turn of a wrench, and the halves of the car bottom fall apart like two hinged doors, and the coal drops into the screening box leading to the iron chute which projects at a low angle from



REAR VIEW OF PIERS.—RETURN INCLINE.

Mr. William H. Ertell, of New York city, has patented a portable trunk rack, with which a trunk can be readily moved from one room to another, however large and heavy the trunk may be. With it there is no danger of injuring the carpet or floor; when desired it may be adapted to be used as a table by simply removing the trunk and placing the center piece or top in the space formerly occupied by the trunk.

An improved draught equalizer has been patented by Mr. Joseph M. Langston, of Waverly, Ill. The invention consists principally of intermediate bars pivoted centrally upon the ends of the main doubletree, to the inner ends of which the lead-horses are to be attached by means of a rod or suitable chains, the wheel-horses being attached to the outer ends of the bars.