## MANUFACTURING, MINING, AND RAILROAD ITEMS.

English Railways now run smoking cars on all passenger trains.

Houston, Texas, claims that she is destined to be the great railroad center of the South.

Cleveland is trying the experiment of concrete pavement between the rails of her horse railways.

The Egyptian cotton crop is reported for this year as 400,000 bales, against 250,000 for last year.

A quarry of stone, said to be equal to the best French burr for millstones, has been discovered near South Pass in Southern Illinois.

North Germany has now six iron clads, carrying in all seventy guns. Its entire naval force is 563 guns.

Pennsylvania has 4,311 miles of railroad; Ohio 3,398 miles; New York 3,345 miles; Illinois 3,224 miles. In 1860 Pennsylvania had only 2,598 miles.

The *North American* says a project is on foot to effect steam communication by water between Ohio and the Gulf of Mexico, at Mobile, passing through the Tennessee river past the Muscle Shoals, and connecting with the Coosa river by a steam canal thirty miles long.

Three hemp cables have just been completed at the Chatham dock yard for the British navy each twenty six inches in circumference, one hundred and one fathoms long, and weighing 13,000 pounds.

The Philadelphia *North American* says the Union Pacific Railroad is forwarding ninety car loads of construction material to the end of the track daily. A large number of snow plows have been placed at convenient distances in the mountains ready for use.

Before the war nearly 2,000 men were employed in various occupations in the Norfolk Navy Yard, while at the present time the number does not exceed 400.

The Hartford and New Haven Railroad Company are erecting gates on each side of the railway crossing on Mainstreet, Meriden, to prevent loss of life and property, which hitherto have been constantly endangered.

During the first half of the present year France imported raw cotton to the amount of 230,384,135f., more than half of which came from this country The exportation amounted to 39,461,604f

The manufacture of smoking pipes in France has followed the ever-advancing increase of tobacco consumption, and represented in 1867 upwards of fifty-two millions of francs.

The deep-sea dredging expedition, in which Dr. Thomson, of Belfast, and Dr. Carpenter and son, of London, were engaged, is reported as having been generally successful. Some new species of submarine animals have been discovered.

Ten cars of the Atlantic and Great Western Railway were destroyed by fire recently. The fire was caused by an explosion in the forward car which is supposed to have contained nitro-glycerin. The engine was completely demolished, and the engineer seriously wounded, and the fireman slightly hurt. The cars were loaded with flour and pork. A house, a quarter of a mile from the wreck, was demolished by the concussion.

## Recent American and Foreign Patents.

*Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.*

STEAM BOILER.—John L. Thomas, Alliance, Ohio.—This invention consists in indicating the hight of water and the steam space by a revolving dial wheel operated by a chain and float, the motion of which wheel also operates a cock in the feed-water pipe, so as to control the quantity of water which is admitted into the boiler.

HORSE HAY RAKE.—Geo. C. Shaler, Gilboa, and Harry Barlow, Herbert, N. Y.—This invention relates to a new and useful improvement in horse hay rakes, the object of which is to rake and dump the hay or grain in heaps without scattering, and at the same time to keep the teeth of the rake clean and free from being clogged or chocked.

FANNING MILL.—George Richards and David Strickland, Richland Center, Wis.—This invention has for its object to improve the construction of fanning mills, so as to make them more convenient and effective in operation.

HAME FASTENER.—Wm H. Payne, Janesville, Wis.—This invention has for its object to furnish an improved hame fastener, simple in construction, durable, easily attached and detached, and which will hold the hames securely fastened.

CALORIC ENGINE.—H. D. Wallen, Jr., Fort Columbus, New York city.—The object of this invention is to provide a hot air engine which will work with better results than those heretofore made. The general features of the invention consist in the employment of two parallel cylinders, each cylinder being provided with air-heating chambers at each end. The cylinders communicate with each other through suitable ports opening from the heating chamber of one cylinder into the adjacent heating chamber of the other, and these ports are provided with valves, the timely operation of which is accomplished by suitable valve gear. The pistons are made by means of any suitable "lost motion" devices to move and rest alternately; one piston being at rest either at the top or bottom of the stroke, while the other piston is making the stroke towards the resting piston. This action allows time for the air to be received into and heated in the air chambers at either end of the cylinders, which is a prominent feature of the invention. Another advantageous feature is obtained in the utilization of the excess of pressure in the first cylinder to assist in actuating the piston of the secondor auxiliary cylinder, whereby the expanded air of the first cylinder escapes into the second heating chamber and by its pressure assists to actuate the second piston to make its stroke while the first pision is resting.

HEATING ATTACHMENT FOR STOVES.—John Norris, Mount Pleasant, Md.—This invention is an improvement upon the "Ten-plate Stove," and consists in constructing one of the oven doors of the same with a bay, from the top of which projects a short tube or collar, which conveys heated air to the upper apartments of the house, by means of suitable pipes, and also, when the pipes are removed, serves for certain culinary purposes.

WATER AND STEAM VALVE AND CYLINDER.—Richard Gornall, Baltimore, Md.—In this invention the cylinder valves are worked by the direct action of the live and exhaust steam, without the intervention of tappets, eccentrics, cams, or any other device outside of the steam chest and cylinder.

FOLDING CHAIR.—Asahel C. Boyd, Grafton, Mass.—The object of this invention is to construct a simple, cheap, and light chair, which can be instantly folded into a very small compass, for convenience in packing, transportation, etc.

SOLDERING FURNACE.—Conrad Seimel, Greenpoint, N. Y.—This invention consists in a mechanism in which solder may be heated, and provided with an arrangement for supporting vessels in a convenient position for applying solder.

HEATER.—C. S. Doolitell, Mansfield, Ohio.—This invention has for its object to improve the construction of stoves, furnaces, and other heaters, in such a way as to utilize a larger proportion of heat than is possible with heaters constructed in the ordinary manner.

GRAVE MOUND.—Jonathan Meley, Trenton, Tenn.—This invention has for its object to improve the construction of grave mounds, so as to make them ornamental, and especially so that the mound may not be disfigured by the sinking of the grave.

CHURNING APPARATUS.—Edward J. Moore, Westfield, N.Y.—This invention has for its object to improve the construction of the improved churning apparatus patented by the same inventor April 17, 1868, and numbered 76,497, so as to make it more convenient and effective in operation.

ANIMAL TRAP.—Wilson McClure, Sinking Spring, Ohio.—This invention has for its object to furnish a simple, cheap, and effective trap, by means of which the animal may be killed when caught.

COMPOSITION FOR BUILDING BLOCKS, PAVEMENT TILES, ETC.—Samuel E. Carr, Danville, Pa.—This invention has for its object to furnish an improved composition for forming building blocks, pavement tiles, and for other similar purposes, which shall be cheap and durable, forming a hard and permanent structure.

LOCKING JOINT FOR HORSE HAY FORKS.—C. A. Howard, Pontiac, Mich.—This invention relates to improvements in locking joints for horse hay forks, and has for its object to provide a more simple and convenient locking joint than any now in use.

PACKING CAN.—N. P. Lindergreen, Boston, Mass.—This invention relates to improvements in packing cans, the object of which is to provide cans of the best form for packing, which shall at the same time be strong and durable.

MATCH COMPOSITION.—Wm. H. Rogers, New York city.—This invention relates to the use of new materials or ingredients for composing friction and other matches, whereby the match is made self igniting and combustible throughout its whole length, and whereby the match is made flexible and may be coiled like cord or wire in a small space.

LINE HOLDER.—D. W. C. McMaster, Southborough, Mass.—This invention relates to a device for holding clothes lines, cords, or ropes used for other purposes.

EVAPORATOR.—James Taylor, Canton, N. Y.—This invention relates to the evaporation of sap for making maple sugar, for evaporating the juice of the sorghum for making sirup or sugar, and of salt water in making salt.

COMBINED SQUARE AND BEVEL.—E. B. Foster and John G. Witt, Elmira, N. Y.—The object of this invention is to furnish on one article (or tool) a combination of various useful tools which are indispensable in the mechanic arts.

JOINT OR SEAM FOR SHEET-METAL BOXES.—E. A. Thomas, Philadelphia, Pa.—This invention relates to a new and improved joint or seam for joining the edges of the piece of sheet metal, which forms the body or main portion of a box or can. The object of this invention is to obtain a side seam or joint which may be made very expeditiously and perfectly tight.

FENCE.—J. M. Chaplin, Middleport, N. Y.—This invention relates to a new and improved fence of that class in which the pickets are attached to wires. It also relates to a new and improved manner of straining the wires and in attaching the pickets thereto.

HAY FORK.—C. H. B. Kellogg, Tontogany, Ohio.—This invention relates to a new implement to facilitate the handling of hay, and it consists in expanding and contracting hooks, or tines attached to a central movable rod.

WATER WHEEL.—Gardner Cox, Pierpoint, N. Y.—This invention relates to a new and improved water wheel, of that class which are secured to a vertical shaft and consequently rotate in a horizontal plane.

DUMPING WAGON.—G. R. Sneath and C. H. Sneath, Wilmington, Del.—The object of this invention is to provide a simple and effective dumping wagon. It consists, in general terms, of a wagon body, or box, arranged to tip backwards on a trunnion shaft, having bearings in the bed frame properly supported upon springs, together with other devices, the said bed frame being braced and provided with devices for relieving the trunnion shaft from the weight of the body or box when the latter is in its horizontal position on the bed frame.

AIR SPRINGS.—Jackson Corriston, Sandusky City, Ohio.—This invention relates to improvements in air springs for use on railroad cars, or for any other purposes for which they may be found useful. It consists of springs composed of a series of concave perforated sheet metal diaphragms, arranged in pairs reversely to each other, united together alternately at their outer and inner edges, and joined together at each end to concentric disks, and provided with an interior guiding tube secured to one end, and a plunger secured to the other end, which works in the said guiding tube, the two serving as a guide for the proper action of the spring while in use, and to prevent a collapse of the same if an opening should occur through which the air should escape. It is also provided with a valve for admitting air, and for closing to prevent the escape of the air after the spring has been filled.

PUMP.—C. H. Dreyer, Nashville, Tenn.—This invention relates to improvements in pumps, the object of which is to provide an improved double acting pump.

FEEDING ROLLER FOR EDGING SAWS.—E. C. Dicey, Montague, Mich.—The nature of this invention relates to improvements in feeding rollers for edging saws, and other similar purposes, whereby it is designed to counteract any tendency of the saw to draw the board out of a straight course.

PLOW.—M. Berdan, Maumee city, Ohio.—This invention relates to a new and improved means for attaching a subsoil share to an ordinary plow, whereby said share may be adjusted higher or lower as desired, and held very firmly in position when adjusted.

MACHINE FOR TURNING BROOM HANDLES.—G. M. Morrow, Clarksville, Ohio.—This invention is a machine for turning broom handles or other rods that require to be tapered, and consists in the employment of cam wheels, which compel the action of the bits together, with other devices perfecting the whole.

WAGON BRAKE.—Simeon R. Bolton, Prescott, Wis.—The object of this invention is to provide a simple and efficient braking apparatus for vehicles.

BABY JUMPER.—Charles Rich, Poughkeepsie, N. Y.—The object of this invention is to construct a baby jumper, so that with a simple apparatus it can be adjusted conformable to the weight of the child, and so that the child can be placed therein securely, that it cannot fall off its seat.

VISE FOR STRETCHING TELEGRAPH WIRES.—Geo. M Thompson, Boston, Mass.—The object of this invention it to construct a device for stretching telegraph wires, so that persons on poles can, with but one hand, apply the instrument and stretch the wire, while with the other hand they can hold fast to the pole

OPERATING PUMPS.—Charles W. Hoyt, South Norwalk, Conn.—This invention relates to a new and improved means for operating pumps and is more especially designed for those cases where the power cannot be conveniently applied in close provimity to the pump.

CAST IRON PIPE CORE.—John Enright, Louisville, Ky.—This invention relates to the construction of cores used in iron foundries in the manufacture of cast-iron pipe, and it consists in forming the core of iron or other metal and in such a manner that the core is made so as to be expanded and contracted.

LEACH TUB.—Wm. Banzett, Brooklyn, E. D., N. Y.—This invention relates to a new manner of securing the cover to a standing leach-tub, and consists in the use of an elastic packing strip, interposed between the edge of the tub and the cover, and of a series of hooks pivoted to the tub by which hooks the cover can be securely clamped upon the tub, yet so that it can be easily removed when desired.

CAKE MIXER.—James Lafetra, New York city.—This invention consists in the use of two fingered stirrers, suspended from the cover of a tub, one of the stirrers being stationary and the other rotating; the stationary fingers project upward from the lower bar of a yoke, while the rotating fingers project downward from a cross bar that is attached to a shaft, having the bearings in the cover. The rotating fingers pass between the stationary fingers and keep the contents of the tub well stirred.

VISE.—John C. Crumpton, Philadelphia, Pa.—The object of this invention is to provide a wrench which may be constructed more cheaply and which will be more durable and convenient than those now in use. It consists in the arrangement of the front jaw, bed piece, and shield for the screw in one piece, also in the arrangement of the sliding jaw in connection with the said bed piece and shield and also in the method of adjustably connecting the vise to the bench.

GAITER BOOTS.—W. H. H. Babbitt, New Corner, Ind.—This invention relates to an improvement in gaiter boots and is confined to the fastening of the gaiter around the ankle and to the parts connected therewith, whereby the fastening is rendered durable and the ankle is properly supported.

STEAM GENERATOR.—V. D. Anderson, Milton, Wis.—The object of this invention is to provide a simple and economical steam generator for domestic uses.

DEVICE FOR UNLOADING HAY.—Joseph Backus Greenvale, Ill.—This invention relates to a device for unloading hay from wagons, if upon stacks, and consists in the construction and arrangement of a derrick, which can be used for the purpose of transferring the hay from the wagon, and in a new device for holding the hay while the same is being transferred from the wagon to the derrick.

BUCKET FOR CHAIN PUMP.—Orrin O. Witherell Lewiston, Me.—This invention relates to an improvement on that class of chain pump valves, in which a rubber or other elastic plate or ring is clamped between two metal plates, and the invention consists in the use and arrangement of a screw by which the parts are held together.

## Answers to Correspondents.

*CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.*

*SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at $1 00 a line, under the head of "Business and Personal."*

☞ *All reference to back numbers should be by volume and page.*

J. T. R., of Pa.—Eggs may be preserved by packing them in salt, pickling them in brine, or varnishing them by a solution of gum arabic in water. The best way is to apply the solution first, and then pack them in salt. The package should be frequently turned to prevent the yolk from settling to one side of the shell.

H. B. L., of Mass.—"Why are rubber diaphragms not adapted to water meters?" Such diaphragms are used, and we have never heard any objection made to their use, except want of durability. Those who use them state that they will last well, provided they are not required to perform much work in the driving of valves etc.

W. H. M., of Pa.—Hollow mills or cutters used for turning studs or stems which cannot be swung in a lathe, are frequently split in hardening from the neglect to drill a small pin hole through one side to the bottom of the drilled cavity to permit the escape of the steam generated in the process. Give this chance for escape and the milling tool will not crack.

A. B. T., of Mass.—You are wasting your time in filing and draw-filing your turning tools. First, because no file finish will stand hardening, tempering, and work, so well as a grindstone finish, and second because a good tool forger ought to make a tool so that it would require nothing but the grindstone.

M. S. P., of Pa.—Wenderoth, the distinguished photographer of your city, makes a varnish suitable for preparing photographic prints to receive colors.

H. C. D., of Mass.—In the proper use of the mouth blow-pipe the air is very little vitiated by passing through the mouth. Of course the purer the air, the hotter the flame will be.

C. H., of N. Y.—We decline your communication on the use of sulphuric acid in photography. The suggestions it contains are impracticable. We publish this week an article on lithography. We know of no work that treats of the subject in full, as the art is now conducted,

C. W. M., of N. Y.—To coat iron with zinc or tin, clean with dilute sulphuric acid and a scratch-brush. Wash thoroughly, and immerse it in melted zinc or tin. When tin is used dust the iron with sal amoniac before immersion.

J. H. P., Conn.—A pipe filled with water, having its upper end closed and the lower one open, will not retain water if its diameter is so great that capillary attraction will not keep the fluid column from breaking. Neither will water be retained in the long leg of a siphon having the end of the shorter leg closed when the diameter of the pipe is too great. The maximum diameter at which this effect may be obtained varies with the material of the tube and the nature of the fluid. When the tube is of glass, and the bore is about one-tenth of an inch, water will be retained unless the tube be smeared with some substance which repels water. When thus retained, the force which keeps the water in the tube, is chiefly the pressure of the atmosphere upon the exposed end of the fluid column. A column of water cannot be sustained at a hight exceeding 34 feet at the level of the sea.

## Business and Personal.

*The charge for insertion under this head is one dollar a line.*

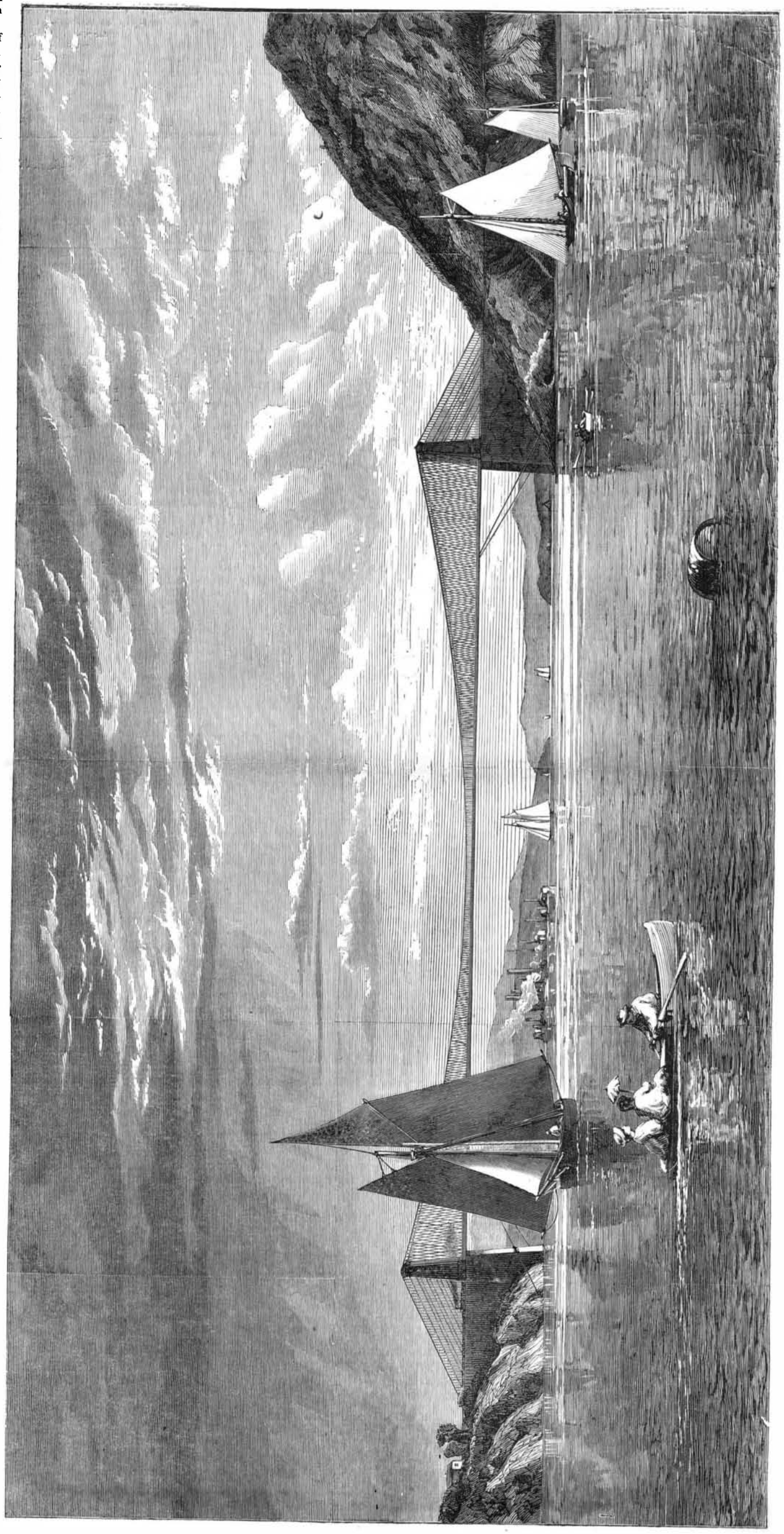
### Proposed Railroad Suspension Bridge Across the Hudson River.

Our engraving presents a view of the new suspension bridge proposed to be thrown across the Hudson River to connect the great West directly with New York and Boston. The engraving was taken from the drawings of General Edward W. Serrell, the engineer-in-chief of the bridge company. On the 8th of this month the board of engineers and directors made an excursion on the river to examine for a proper site. The precise locality has not yet been determined, but it will be somewhere between Verplank's Point and Buttermilk Falls. The proposed bridge is one link in the railway intended to connect the Erie road with railroads on the east side of the river. The road will run from Turner's, on the Erie railroad, to Derby in Connecticut.

The following are some of the dimensions of the proposed bridge: Clear span, 1,600 feet ; length of bridge between the towers, 1,665 feet ; total length, including approaches, 2.499 feet ; height of bridge above high-water, 155 feet ; height of towers above the water, 280 feet; working safe load for the railroad lines, 2,400 tuns ; working safe load for the highways, 2,880 tuns ; total safe load for the bridge, 5,280 tuns ; load that would break the bridge, 25,171 tuns ; miles of steel wire in cables, 70,302 ; total weight of iron and steel in the bridge, 17,005 tuns ; total amount of masonry, 58,084 cubic yards ; total suspended weights, 9,651 tuns.

There will be twenty cables, in four systems ; each cable will be 14 inches in diameter. The bridge will carry at one time 32 passenger cars : it would carry safely 34,560 people and 60 locomotives, if they could be placed upon it at once ; 18,000 people and 53 locomotives would fill it. From the dimensions given above, it will be seen that this bridge will be longer than any one yet built on the continent, though a span of 1610 feet is projected in the bridge undertaken to be built across the St. Lawrence at Quebec.

These figures will show the enormous strength it is proposed it shall possess. New York city and every part of the country, east and west, are interested in it, and it is to be hoped the work upon the ground will soon be entered upon vigorously.



SUSPENSION BRIDGE OVER THE HUDSON.

### East Indian Opium.

At Patna is one of the two great opium factories of India. It is the greater of the two, and may, therefore, be safely styled the largest poisoning agency in the world. The establishment faces the river Ganges, whose bed is here four miles across—at this season a desert of caked mud, with the river faraway on the other side of the waste. The opium is shipped to Calcutta in a steamer, and it is a good instance of the fickleness of Indian rivers—those plagues of engineers—that last year, and for many years before, the sacred stream ran so close to Patna, that wharves were erected from which the chests could be put right on the steamers, and where the timber wherewith to make the next year's chests could be landed. This year the chests have to be carried a mile orso before being shipped.

This opium-packing for 1867 was just over at Christmas, and nearly 30,000 chests of China opium had been sent down to Calcutta, worth about £4,000,000. Each chest contains 40 cakes—the dark, sticky stuff, ingeniously inclosed in a coating of dried poppy-leaves, so that each cake (weighing about two pounds) presents the appearance of a Dutch cheese or a cannon-ball. It has given rise to the saying that in war the British gave the Chinese cannon-balls of iron, and in peace cannon-balls of opium, thus giving them the choice of being shot or poisoned, and making them pay smartly for either attention. In return for this, they feed us with tea and clothe us in silk, which seems to show a truly celestial spirit.