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## RAIL-ROAD NEWS.

### Railroad Accidents and Management.

A return was made, on the 10th of last May, to the House of Commons, England, by the Railway Department of the Board of Trade, showing the number and description of accidents which took place on all the railroads in Britain, during the last six months of the previous year. The number killed was 113, and the number injured 264. The whole number of passengers carried was 47,509,392; this includes the whole number of accidents by carelessness, self-destruction, collision, &c. Out of this number only eight passengers were killed, or only one person in every six millions carried. The rest who were injured and killed were persons in the employ of the several companies, trespassers, &c. The safety of such a system of travelling as that of the English railway, is a most wonderful triumph of good and skillful management. When we consider the high velocities of their trains, the thickly populated districts through which they run, and the great number of passengers carried, we look upon such a system of railroads, and their management, with wonder and admiration. The double tracks of these roads tend to promote safety, for it is certainly reasonable and obvious to any man who can reason, that they must be more safe than railroads of single tracks; and yet a correspondent—an engineer—in the American Railway Times, subscribed himself as a believer in the safety of single over double tracks; in other words, he believed that accidents were more frequent on double than single tracks. The safety of the English system of railroads is well worthy of the attention of our people. It is the duty of all Americans, as being the greatest utilitarians in the world, to adopt everything that is good and useful, without any reference to the source whence it is derived.

### A French Railway Train Struck by Lightning.

The *Moniteur de Loiret* states that during a late thunder storm the electric fluid struck the luggage wagon of the train proceeding from Orleans to Paris, and after having made an irregular hole in it, passed through the articles of luggage without doing them any injury, and then ran along the iron chains which unite the wagons together. The conductor, who was seated on the luggage wagon, experienced a sharp electric shock, and all the passengers in the train one of slighter description.

The great tunnel on the Nashville and Chattanooga Railroad has been completed, and the opening of the railroad through was to be celebrated with a great festival, in which ten thousand persons were expected to participate, on the third inst.

Privileges have been granted by the Hawaiian government to run a line of steamships between the Sandwich Islands and San Francisco. Messrs. Glen, McLane, and Patterson are the owners of the line.

## IMPROVEMENTS IN NAVIGATION,—THE BENDER.

Figure 1.

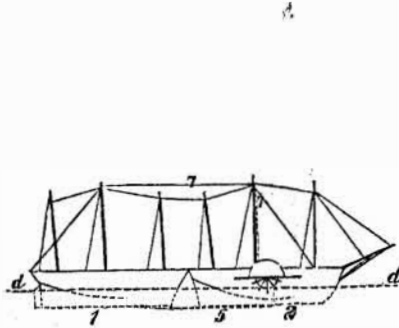
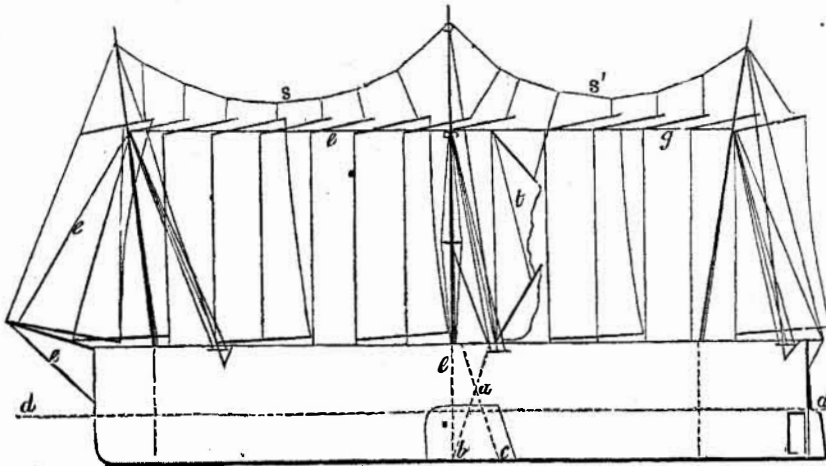


Figure 2.



Figure 3.



A general, although rude, idea of the design of this contribution to the art of navigation (for which letters patent are now being sought) may be obtained by supposing the following case:—

Let two ships (1, 2, fig. 1) be tied together, the stem of one to the stern of the other, in such a way that they cannot swing around. A strong chain passes from the mainmast-head of 1 over a pulley on the maintop of 2, and down into the hold, where it winds around a wheel on the shaft of the paddle-wheels. A similar chain passes from the foot of the cutwater of 1, along the keel of 2, and ascends through a well up to a second wheel or pulley on the shaft. Exposed to rising and falling waves, the motions of these ships would cause the chains to draw alternately upon their pul-

leys on the shaft. Figure 2 explains the mode of this action. At 3 is seen a section of the shaft and one of the pulleys (that worked by the keel-chain). The shaft carries a ratchet wheel, and the pulley has a catch, dropping into the teeth, so that when the rising of either ship causes the keel-chain to draw upon its pulley, the shaft must revolve in the direction of the arrow. When that pull is ended, and the reverse motion begins, the rope, 5, by means of the weight, 6, takes up the slack of the keel-chain, so that the pulley is ready for the next draw. The action of the mast chain, 7, is precisely similar, but the teeth of its ratchet-wheel point in the other direction. The fall of the head-ship causes the mast-chain to drive the shaft with the arrow, while its rising is attended with a pull from

Figure 4.

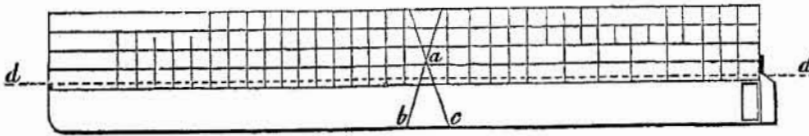


Figure 5.

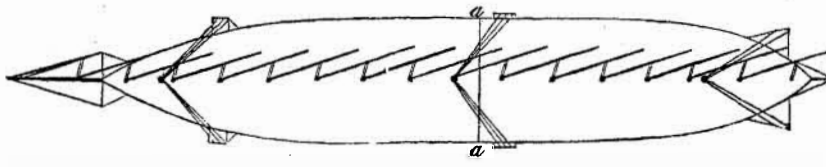
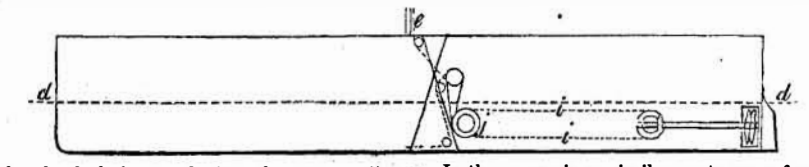


Figure 6.



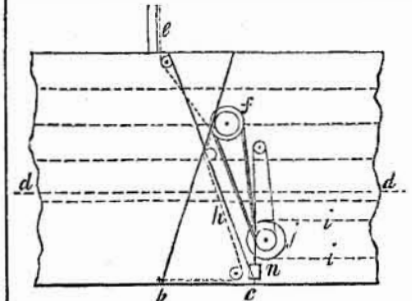
the keel-chain, producing the same effect. The motive power is the weight of the ships, and its limit the strength of the chains.

This mode of tying ships together is obviously absurd; but is it not possible to cut a very long ship in two, and so attach its sections that an effective use can be made of this magnificent wave-power?

In the engravings, similar parts are referred to by the same letters. The point of flexible juncture is seen at *a a*; at *a b, a c*, are strong bulkheads; the powerful iron hinges are in the sides, with a base of 50 feet for resisting lateral strains. The angle, *b a c*, shows the extent to which the fore-ship may drop below the line of the aft-ship.

The engravings suppose a length of 300 feet, with a breadth of 50; but, on the water-line, *d*, the breadth is only 40 feet, with a rapid decrease below that line; draft of water 20 feet, with a deep keel; ballast, as little as possible.

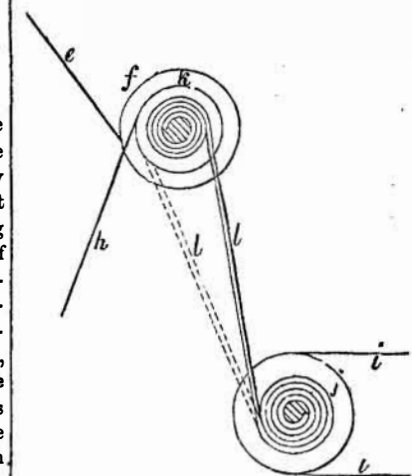
FIG. 7.



Whether bent at the middle, over the crest of a wave, or hanging with its stem and stern elevated upon two crests, the position of the Bender must, under all circumstances, be nearly upright. It will have great stability, even when its upper deck is thirty-feet above the water-level, as shown. Its sides may, therefore, safely swell out above the water-line, instead of "tumbling in," as it has no heavy spars aloft.

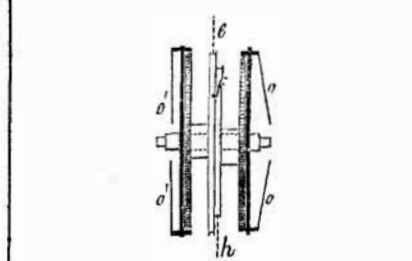
The foot of the mainmast is movable in a socket; it stands a few feet before the line of the hinge-joint, *a*, and its shrouds are as far abaft that line, so that however this vessel may bend, the top of the mainmast is always

FIG. 8.



equi-distant from the fore and mizzen masts. (If fast, the mainmast had better stand on the aft ship; unless the vessel is cut in two at two points, which would require four masts and various new arrangements). A strong wire-rope, *e*, starts out from the cutwater, passes over the bowsprit, over the top of the foremast, over a pulley at the mainmast-head, and from thence down along the mainmast into the hold, where its end is made fast to the double wheel or pulley, *f*, fig. 7. A similar wire-rope, *g*, passes horizontally from the head of the mizzenmast to and around another

FIG. 9.



pulley at the head of the mainmast, from which it goes down some thirty feet, and unites with *e*. A chain, *h*, passes out from the keel at *b*, goes around a pulley near *c*, and thence up to a smaller part of the double pulley, *f*, figs. 7, 8, and 9, (the two parts of the pulley being firmly fastened together). The fall of the fore-ship, on crossing a wave, causes the rope, *e*, to pull upon *f*, and its rising causes the keel-chain, *h*, to make a pull in the op-

posite direction. Both *e* and *h* are of great strength, and tightly drawn, so that the ends and the middle of the Bender cannot rise or fall to any extent, without giving more or less motion to the double pulley, *f*. This power has to be given over to the paddle-wheels or propelling screw, with a velocity proportioned to its varying force. A shaft from the screw enters the vessel far enough to reach a sufficiently wide space for the wheel-work to be attached to its fore-end, as shown in fig. 6. The power is sent to that point through the endless chain, *i*, from the distributing pulley, *j*, which gets it from the receiving pulley, *k*, attached to *f*.

The chains, *l* *l'*, made thick, with cast-iron blocks, connect *j* and *k*, fig. 8. At each end, these block-chains are made fast to eccentrics, shaped like *m*, fig. 10, so that as the rectangular blocks are wound around the eccentric, the diameter of the coil is rapidly increased, and the power of the chain over the wheel is greater. The block-chain, *l*, gives over to *j* the power of the keel-chain, *h*; and *l'* gives over that of the mast-rope, *e*. The pulls of *e* and *h* are made more or less effective in driving the propelling screw, according as more or less of the length of the block-chains is wound up on the eccentrics at each end. The distributing pulley, *j*, has a rope attached to each eccentric for its block-chains, carrying a weight, *n*, fig. 7, the effect of which is to take up the slack of its block-chain and coil it up on the eccentric, ready for the next pull. Each block-chain has its own weight, *n*, and they act alternately.

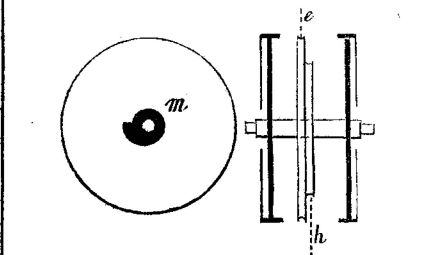
The receiving pulley, *k*, is shown in figs. 9, 10, and 11. All the parts in fig. 11 rotate together, with a reciprocating motion, in obedience to the alternate pulls of *e* and *h*. Fig. 10 is one of the eccentrics with its ratchet-wheel—both cast in one piece. In fig. 9 both eccentrics, with their ratchet wheels, are in place. The detents, *o* *o'*, are shown engaged; while those on the other side, *o'* *o*, are disengaged, as their levers are pressed towards the sides of the double pulley. When both sets of detents are disengaged, the pulls of *e* and *h* have no effect upon the block-chains, *l* *l'*, and the propelling screw has no power laid upon it. If, at the end of a pull, (say of the mast rope, *e*), the engineer were to disengage the detents, *o'* *o*, and at the same time press with a brake upon the ratchet-wheel of that eccentric, the block-chain, *l'*, would not (during the return motion of *e*), be coiled upon its eccentric at *d*; but the next pull of *e*, would wind up an additional length of the block-chain upon the eccentric on *k*, thus increasing the diameter of that coil, and causing it, when receiving the next pull, to drive the propelling screw with more force. If the disengagement of the detents be made the instant before a pull is to begin, the weight, *n*, fig. 7, draws in more of its block-chain upon the coil at *j*, increasing the diameter of that coil just as much as it diminishes the coil on *k*. This adjustment retards the revolutions of the screw. The engineer thus can proportion the effect of the alternate pulls to the strength of all parts of his machinery, whether the wave-power is strong or feeble. The stress of the wave-power upon the hull of the vessel is all resisted in right lines. The machinery, therefore, takes up very little room, and requires no massive bed-plates.

The hull being of an unusual height and rather broad, each of its sections, (the fore and the aft ship), becomes a sort of triangular pyramid, capable of the strongest bracing without much weight of materials. The Bender should float lightly upon the water, while its deep keel guards against lee-way. Its great length gives the finest opportunity for "wave-lines," under the bows and quarters. The booms sweep immediately over the surface of the hurricane deck (figs. 3 and 12), which covers up boats, spars and lumber of every kind, and presents, with the sharp prow and stern, the least resistance to a head wind. The gap, (*b a c*, fig. 3), in the vessel's bottom, is covered with a plate-iron shield, the edges of which are shown in fig. 3. Its turning point (as the middle of the Bender plays up and down), is near the forward edge, a little below the water line. A sheet-copper flap covers the forward edge, preventing the water from flowing in, while the motion of the vessel

causes any water that may be within the gap, to flow out behind the shield. The curves for the bottom, suggested in fig. 12, will greatly strengthen the shield.

The planking of the sides and decks should be double, and laid cross-wise for strength. Many posts should pass up from the lower side frames through all the decks, as in fig. 12. Besides family state-rooms and very ample cabins, this vessel should have some five or six hundred comfortable baths for cabin passengers.

A light framing is justifiable, from the Bender being in sections of 150 feet, and having no central strains, which, in ordinary ships, endanger their "hogging." A 50 horse-power steam engine should be placed near the after-end of the fore-ship, sending its power by an endless chain to the receiving pulley, *k*, to be used in entering and leaving port, in calms, and in emergencies.



The masts admit of strengthening and bracing along the middle of their length, as in the drawings of the mainmast, figs. 3 and 12. The downward strain of the mast-ropes, *e* and *g*, fig. 3, may at times be enormous, requiring great strength in the masts to resist it, if the engineer attempts to use too much of the wave-power. The topmasts should stand on the heads of the lower masts; all the shrouds should be of iron.

Excepting three top-sails for favoring winds, all the sails are "fore-and-aft," fixed on booms and gaffs. Their forward edges run on slender wire-ropes, which extend from the deck to the mast-ropes, *e* and *g*, fig. 3, and easily bend with the wind, holding the sail flat or "broad-wise" to a head wind. The next to the foremost sail has no gaff. The booms should be twice the length of the spaces be-

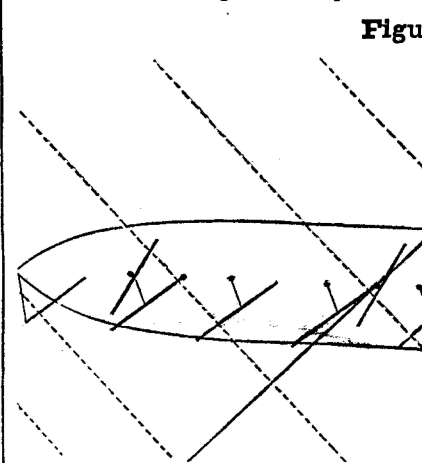


Figure 13.

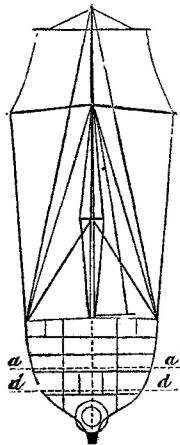
course one of the most favorable for showing what it can do by combined wind and wave power.

As the pull of the block-chains is accelerating, a balance-wheel, connected with the propelling screw, will contribute much to maintain the revolutions between the pulls.

The curve ropes, *s* *s'*, fig. 3, starting out from the fore and mizzen top-mast heads, pass over pulleys in the head of the main top-mast, and after descending along the mainmast some forty feet, unite in one rope, and go on to a

between the sails; so that, in tacking ship, they all (excepting the hindmost boom), have to be raised and the gaffs lowered, as in the sail *t*, fig. 3. This great labor is done by the vessel itself; by means of power taken off from the distributing pulley, *j*, fig. 8, through end-

FIG. 12.



less ropes, which pass up to friction pulleys at the foot of the masts on deck. The lifting ropes from a series of booms are so connected that a single rope, wound around a friction-pulley, and pressed by a brake, commands them all. The wave-power is necessarily in action when the wind is ahead. When running before the wind, with little or no wave-power, the propelling screw is always revolving from the re-action of the water. The friction pulleys thus always have power when the Bender is moving with any considerable speed; by which power (rather than by a numerous crew), the labor of working the ship is to be done. The great length of the Bender requiring a powerful rudder, the wheel should be worked by friction pulleys of its own, rather than by the helmsman's strength.

Fig. 13 shows this vessel running before a favoring wind, and spreading a wide sweep of canvas. The top-sails are set; the forward sail is seen to be double—with two booms and gaffs—and the hindmost has a studding sail. Fig. 5 shows the Bender close-hauled, all the fore-and-aft sails being set at two points from the ship's course. With long ridgy seas, and a steady head wind, the Bender will find this

suitable weight which plays up and down a well in the hold. In scudding before an impracticable sea, the Bender should keep her head to the wind, and steer by power taken from the screw. For voyages in high latitudes, with free winds and unfrequent calms, the Bender, without the burden of a powerful steam engine and its fuel, will probably make better time than the ocean steamers. For more information, we refer to John H. Ewin, Esq., Nashville, Tenn.

#### Union of Telegraphs.

Some important arrangements and combinations in the "world of wires," have taken place recently, by which the Morse and O'Reilly Telegraphs have been united throughout the West and Northwest. The New Orleans and Ohio line, extending from New Orleans to Pittsburg, the People's Line, from New Orleans to Louisville; the two wires of the Louisville, Cincinnati, and Pittsburg line, and the Western line from Wheeling and Pittsburg, to Baltimore and Washington City, are all direct parties to the contract. By these arrangements most of these lines come under the Morse government, and it is the intention to put the prices up about one-third

We have a developing here of that plan by which the chemical telegraph line between Philadelphia and Baltimore was crushed by a decision at law, to be merged into one huge monopoly.

#### Age of Sheep.

The age of sheep may be known by the front teeth. They are eight in number, and appear all of a size. In the second year the two middle ones fall out, and their place is supplied by two large ones. In the third year a small tooth on each side. In the fourth year the large teeth are six in number. In the fifth year the whole front teeth are large. In the sixth year the whole begin to get worn. In the seventh year some fall out or are broken.

It is said that the teeth of ewes begin to decay at five or six; those of weathers at seven, productive for sixteen years.

#### Medical.

Dr. G. W. Davis, of Syracuse, N. Y., in an article in the "Eclectic Journal of Medicine," says he used hydrochloric acid (muriatic acid and water) as a valuable remedial agent in the treatment of many forms of disease, especially in the derangement of the stomach and bowels. He regards it as a valuable tonic and astringent, always operating properly and kindly. In nearly all derangements of the digestive organs when there is a proportion of alkaline secretions, the hydrochloric acid he has found acts promptly and safely. He has found it successful for acute dysentery, after all other means have failed. The way in which it is given, is one drachm of commercial muriatic acid mixed with half an ounce of water; 20 drops of this is given in half a gill of sweetened water every sixth hour.—This has been used successfully as the only remedy for acute dysentery. He has found the muriated tincture of iron very useful in many cases and considers it better than the nitrate or sulphate.

#### The Hillotype again.

The last number of the Ulster County (N. Y.) Examiner, gives an account of a visit to Mr. Hill, the discoverer of the art of daguerreotyping in colors, when the editor was shown some specimens of the art, in which, he says, the most diversified and delicate hues and tints were rendered with the most beautiful distinctness. The writer adds:—

"That the uncovered plates were put in his hand for the most rigid examination by the full light of an unclouded summer day. And one which had not been burnished, was put to that process in his presence, when it took in an instant, the rich enamel-like surface, which distinctly marks the Hillotype from those of the daguerreotype. The fact is, (as we saw from experiment,) the Hillotype is very difficult to remove from the plate as compared with the daguerreotype, nor is it sensitive to the effect of the atmosphere like the latter."

[Mr. Hill must surely be demented, if he can produce sunlight colored pictures and remain with a black patch on his name when he can so easily wipe it off.

#### Roquet Swamp—Ship Timber, &c.

This swamp is situated near Windsor, Bertie Co., N. C.; in length, it is about twenty-seven miles, its average width about seven. This tract of swamp has heretofore been considered worthless, but very lately Lieut. W. D. Porter, while on a visit to Mr. Gillam, was requested by that gentleman to penetrate and examine the resources of the swamp. He did so, and found that its resources could be developed by cutting a short canal to the Cashie river. He is now engaged on this project, which, when finished, will be the means of bringing forward dead capital to an immense amount. Nearly all of this timber will reach the port of Norfolk. The lands of the swamp that are now considered worthless, can be drained by this canalling, after the timber is exhausted. White oak plank and knees, the finest timber in the world for ship building, grow along the banks of the swamp in abundance; fine pine for spars can also be procured; and but a short time back Mr. Gillman delivered at the Norfolk navy yard \$2,000 worth of this pine timber, which was pronounced to be the best government ever received.

#### Genius.

I know no such thing as genius, said Hogarth to Mr. Gilbert Cooper: Genius is nothing but labor and diligence. Sir Isaac Newton said of himself, "that if he had ever been able to do anything, he had effected it by patient thinking only."

Lord Bacon remarked that a man would do well to carry a pencil in his pocket, and write down the thoughts of the moment.—Those that come unsought are commonly the more valuable and should be secured, because they seldom return.

Dean Swift said with much truth, "It is useless to attempt to reason a man out of a thing he was never reasoned into." The best argument will be thrown away upon a fool.