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 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 own its weight, *n*, and they act alternately.

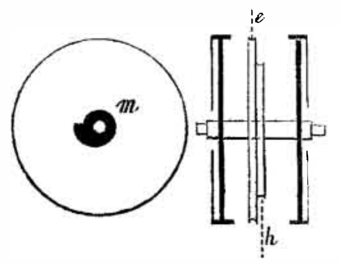
The receiving pulley, *k*, is shown in figs. 9, 10, and 11. All the parts in fig. 11 rotate together, with a reciprocating motion, in obedience to the alternate pulls of *e* and *h*. Fig. 10 is one of the eccentrics with its ratchet-wheel—both cast in one piece. In fig. 9 both eccentrics, with their 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 Ben-

Fig. 10. Fig. 11.

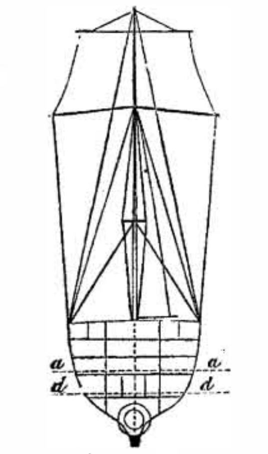


der being in sections of 150 feet, and having no central strains, which, in ordinary ships, endanger their "hogging." A 50 horse-power steam engine should be placed near the after-end of the fore-ship, sending its power by an endless chain to the receiving pulley, *k*, to be used in entering and leaving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

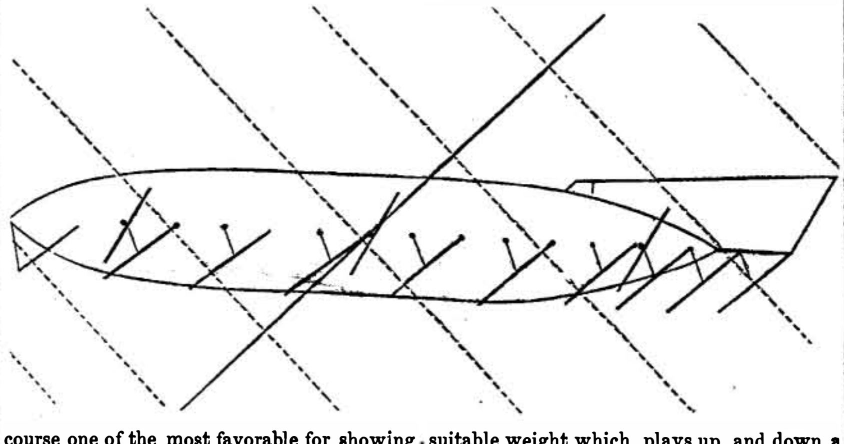
Fig. 12.



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

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 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 voyagas 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 distinctnes. 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.

Roquert 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. Gillmandelivered 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.