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Scientific American.

WHITE'S TUBULAR SUSPENSION BRIDGE.

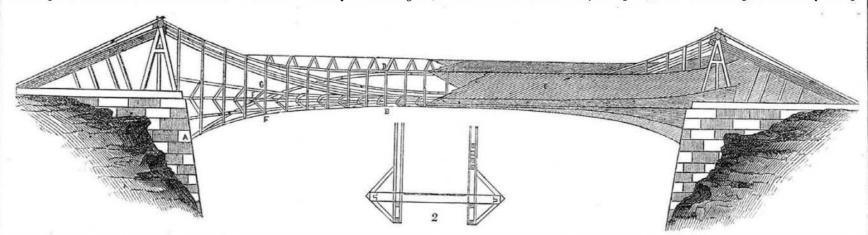
ton, and intended to superside the necessity of piers in crossing our largest rivers. It reis as follows:

Erect the towers on good and firm abut-

The accompanying out represents a new design The number of stringers in each set will de- board upon another, care is taken to fix keys, sion rods are bolted to them and to the girders, for a bridge invented by Mr. Ammi White, Bos- pend upon the amount of strength required in of wood or iron into mortices, made half into one board and half into the other, to prevent the bridge. Each stringer is made by selecting a tree of propers ize, which is sawed square the stringer from elongating, which, with the presents one of 500 feet span, and can, with and is tapered from the top to within about additional bolts placed near the dowels, is as safety, be extended he says, even for railroad five feet of the base. This serves as a start- incapable of divulsion as the tree itself. This purposes 1,500 feet. The mode of construction ing point, on which are spliced good sound suspension chain or stringer is run across the

boards, six or seven inches in width, on a stream by means of a wire cable and pulleys, curve of 40 feet in 500, tilll the required and when locked and keyed fast in the towers, ments, or on a rocky bank; then extend length and thickness is obtained, the whole with the two back stays at C, is allowed to across the stream two or more sets of stringers, terminating in a corresponding, timber, which take a catenary curve. After a sufficient according to the number of road-bads needed. forms the other extremity. In securing one number have been extended across, the suspen- connection with the girders at B. By loading

which are made slightly arching, and to the floor-joist at B. The rafter is connected with the stringer and top of the suspension rod at D, to which is bolted the roof, constructed of double diagonal boarding. The floor, if a turnpike bridge, made of double diagonal planking bolted together, is then laid, and, in the capacity of cross-bracing, serves to render firm the whole structure. If a railroad bridge, the cross bracing is fitted under the floor-joist, in



it is required to sustain, the girders will be so constructed that it receives the strain longiis on, the sides are covered with a double diagonal boarding, similar to that of the roof, both of which must be firmly attached to the towers and back-stays, to form a part of the strength of the bridge. The direct arches are formed by bolting together planks on the right curve, and in the above cut, one springs from the abutment at A, and connects with the stringer at the top of the suspension rod; the other starts from the same point and connects with the girder at B, both connecting in their course with the suspension rods. The side-guards, or braces, are formed by fitting a fender rave to the floor-joist, which extends over the girder several feet according to the length of the bridge. Short rafters connect at the fender rave at F, and the suspension rod, E G. These, together with the projecting floor-joists, are covered with double diagonal boarding. These braces prevent the bridge from vibrating. The back-stays, connected with the studs inserted in the sills of the towers, extend back on shore the required distance, and are firmly attached to stone posts, deeply set in the ground at the extremity of the sills at H.

Fig. 2 is a cross section showing the floorjoists, suspension rods, braces, &c.

Among the advantages claimed over other bridges are-strength, economy, and durability.

Strength. It is obvious, on careful examinaupon paper of a heaviertexture than that used in the thick fur, often crisp, and sometimes an untion of the above design, that in its construction chosen for the contest. This provision is not preceding volumes. dercoat of wool. Changes in color have taken are combined many of the well established printo apply to the vessel entered by the subscri-It is published weekly in FORM FOR BINDING, and place, and the anatomical structure has alterber; his yacht to be held ready to sail at any ciples of science, not the least important of affords, at the end of the year, a SPLENDID VO-LUME of over FOUR HUNDRED PAGES, with a place and time within the period specified, and which is that wood, of which the stringers The ox has undergone similar changes copious Index, and from FIVE to SIX THOUSAND are composed, will bear a greater strain accorunder any circumstances chosen by a majority some in South America called " pelones" ha-ORIGINAL ENGRAVINGS, together with a vast of the owners of the other vessels. That only ding to its weight, than iron. Thus, too, the amount of practical information concerning the proving a clothing of fine fur; others with a nafirst class well-tried sail vessels or yachts may roof, instead of being a dead weight upon the gress of INVENTION and DISCOVERY throughout ked skin, like the Mexican, or Guinea dog. bridge, like others of different construction. be entered for the race. The prizes to be the world. There is no subject of importance to In Columbia, the practice of milking cows was the Mechanic, Inventor, Manufacturer, and general formed as it is, will sustain not only itself, but sailed for are as follows :a large portion of the rest of the structure. given up, and the secretion of milk is confined reader, which ss not treated in the most able man-In case the subscriber's yacht win the race, to the period of suckling the calf. ner-the Editors, Contributors, and Correspondents Also, the double diagonal boarding of the sides the vessel which comes out second, and the being men of the highest attainments. It is, in fact, The wild dog of the pampas does not bark being attached firmly to the suspension rods last out in the race, to be forfeited to him. the leading SCIENTIFIC JOURNAL in the country. like the domestic dog, but howls like a wolf. and towers, form, in connection with the roof, And in case his yacht is beaten, he will de-The Inventor will find in it a weekly DIGEST an immense tube, and being connected with The wild cat has lost the sweet music of the liver her, with all her appurtenances to the of AMERICAN PATENTS, reported from the Pathe suspension chains, which it is impossible caterwauling concert. The wild horse of the tent Office,-an original feature, not found in any winner of the race, as a prize.-[Tribune. to pull apart, and being still farther rendered higher plains of South America is covered other weekly publication. We don't know Mr. Davison, but the above with long, shaggy fur of a uniform chestnut TERMS-\$2 a-year: \$1 for six months. firm by the directarch, together with the side All Letters must be Post Paid and directed to seems to be fair, yet we venture to predict guards, it will not break down, deflect, nor vicolor. The sheep of the central Cordilleras MUNN& CO., that it will be a long long time before Mr. brate, with any weight it is required to susproduces a thick, matted, wooly fleece, which Publishers of the Scientific American, Davison makes good his bravado. He has breaks off in tufts, and never re-appears. The tain. 128 Fulton sireet, New York. Economy.-That this structure is comparagoat has lost her large teats, and produces two published so many strange challenges about INDUCEMENTS FOR CLUBBING. this thing and that thing he was going to do, or three kids annually. Similar changes octively economical, is obvious from the facility Any person who will send as four subscribers for six months, at our regular rates, shall be entitled to cur in geese and gallinaceous fowls. Rumpall of which have yet to be done, that we have with which materials for its construction can no confidence at present in what he puts forth be procured; they consisting mainly of boards less ones have sprung up, wanting the caudle one copy for the same length of time; or we will as anything worthy of superiority. What and planks, which can be put together much vertebræ. Cats are frequent on White river fornishhas become of his steamship that was to sail more cheaply and expeditiously than large without tails. Ten Copies for Six Months fer \$ 8 to England in less than nine days, we believe, Ten Copies for Twelve Months, 15, The fat-tailed sheep of Tartary loose their timbers hitherto used. And even if the roof Fifteen Copies for. Twelve Months, 22 should be dispensed with, the inside, like the mass of fat on removal to Siberia. The Afriand with which he challanged the world for Twenty Copies for Twelve Months, 28 can sheep has become like a goat covered with millions? The Tribune is a great paper for outside, being covered with a double diagonal Southern and Western Money taken at par for boarding, leaves only the road bed exposed to hair. The Wallachian sheep are different still. publishing and noticing all such nathing-insubscriptions, or Post Office Stamps taken at their the weather, which can be replaced without The wild horses of Siberia have anatomical dif. them novelties. full value.

either kind of bridge with double the weight detriment to the main structure ; also, being ferences from tame ones. It is a question brought down to a level, and while the weight tudinally, a comparatively light structure will belong to the same species, though it is refersustain an immense weight, besides dispensing with piers, which is by no means a small item in bridge building, especially over our broad, rapid rivers and deep ravines.

Durability .- Little need be said under this head, when we call to mind the well established fact that small timber, planks, and boards, when thoroughly seasoned and secured from the weather, will last vastly longer than arge timber which cannot be thoroughly seasoned in any reasonable time, the consequence of which is, the inside becomes decayed, while the outside is apparently sound.

Persons interested in bridge building, and desirous of obtaining further particulars, may address Ammi White, 17 Prospect street, Boston, Mass., or Joshua P. Thayer, Cambridgeport, Mass.

Variations from Climate in Organic Life. Organic life assumes new characteristics under new influences. The domestic animals of Europe were not found in this country on its discovery. They escaped from the Spaniards, and ran wild for centuries. In consequence, new and striking characteristics have been acquired in accommodation to the novel circumstances. The wild hog strikingly resembles the wild boar of Europe. The hog of the mountains of Parasmus resembles the wild bo ar of France. Instead of bristles, which the stock has from which he sprang, he has a

among naturalists whether the dog and wolf red to one species. But between these the differences are immense, from the gigantic St. Bernard, and the New Foundland, to the little lap dog in a lady's arms. The cow, the domesticated fowls, and pigeon, have put on infinite varieties of size, color, and character.

Yacht Bacing in America and Europe.

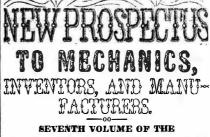
Darius Davison writes us that it is his intention to build a yacht within the period of six months from the date, of a tonnage and cost equal to the tonnage and cost of the vacht "America;" said yacht to be built, modelled, and rigged different from any vessel or yacht afloat. And to be held ready at any time within the period of one year from the date (after being completed) to sail against any vessel or yacht, or number of vessels or yachts, now afloat in this country or Europe, that may be entered for the race. The trial of speed and sailing qualities to take place at any time chosen by a majority of the owners of vessels entered for the race, and to be run as they shall choose, for any distance, upon the ocean or inland waters, in a heavy or light breeze, with or against the wind. The owner of any vessel entered for the race, not satisfied with the time and circumstances chosen by a majority to make the trial of speed and sailing qualities, shall be at liberty to withdraw such vessel, at any time before one week preceding the time

Antidote for Arsenic.

Mr. Gideon Paul, of Detroit, Mich., writing to us, says, "the hydrated sesquioxide of iron is a better antidote for arsenic than the protoxide, and that, I am sorry to say, is not kept, as a general thing, in druggists' stores "

Sails of the Yacht America.

The sails of the yacht America were made of cotton duck, manufactured at Colt's factory Paterson, N. J. It is said that a vessel with cotton sails will sail one knot per hour faster than with canvas. It is closer and retains the wind much better.



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AMERICAN & FOREIGN PATENT AGENTS, And Publishers of the SCIENTIFIC AMERICAN, respectfully announce to the public that the first number of VOLUME SEVEN of this widely circulated and valuable journal was issued on the 20th of September in AN ENTIRE NEW DRESS, printed