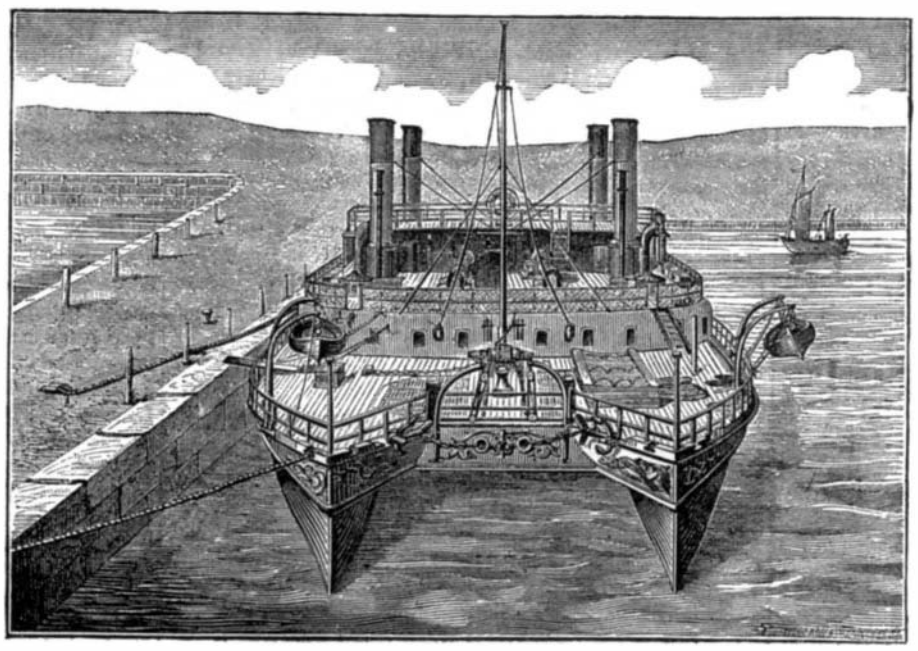
THE TWIN CHANNEL STEAMER CASTALIA.

Unlike the Bessemer, which vessel is now admitted to be a failure, the Castalia, as the twin-hulled steamer plying across the English Channel is named, has turned out a success. Both ships were built with the idea of reducing rolling or pitching motion, and consequent sea sickness among the passengers, to a minimum. The Bessemer, it will be remembered, was fitted with a swinging saloon which, it was imagined, would remain at rest despite the oscillations of the ship. The Castalia has no such appliance, but her inventor has relied on her long and widely separated hulls never being submitted to the action of one and the same wave. While this last might not be possible on the Atlantic, where the long ground swells will affect even the largest of vessels, it is apparently quite true of the English Channel, where the sea is short and chopping. The Castalia therefore has been found to be remarkably exempt from the uneasy motions of ordinary vessels, while she is as readily controlled and directed as the latter.

The length of each hull is 234 feet, beam of each 16·4 feet, depth of hold 12·6 feet, and they are separated a distance of 25·2 feet. The bridge which unites the two vessels is of elliptical tubular section, and is extremely strong, as it necessarily must be in order to bear the opposing wrenching strains of the double hull. On the bridge are located the cabins and saloons, a hurricane deck above serving as a promenade. The ship is flat-bottomed, and draws but 5·7 feet of water, so that she can easily enter any port in the vicinity of her station without regard to the condition of the tide. Her motive power consists in two paddlewheels arranged in the space between the hulls, each wheel having its own engine. An excellent representation of the vessel is given in the annexed engraving.



THE TWIN CHANNEL STEAMER CASTALIA.

IMPROVED METHOD OF COVERING STEAM BOILERS, ETC.

Inventions and appliances for economizing steam and fuel are continually being patented and brought into general use, and in times of depression like the present claim the attention of manufacturers and steam users in a more than ordinary degree. By no means the least economizer of fuel and steam is a good durable covering for boilers and steam pipes, such as is illustrated in the annexed engravings. The invention, shown in section in Figs. 1 and 2, consists, first, in leaving an air space or dead air chamber between a wire covering and the surface covered; second, in the keying of some plastic material on the wire cloth; and third, in giving a double check to radiation by the confined air and the non-conducting composition. There are numerous other advantages which might be mentioned, but the abovenamed are the most prominent. The air space is made by taking heavy wire cloth, to which is fastened, every four or five inches, a stud one inch or more in length. The wire cloth is then fitted over the surface to be covered, the studs keeping it the necessary distance off. The plastic material is next applied in two or more coats. The first coat partly penetrates the meshes of the wire cloth and keys itself, obtaining a strong, durable hold. The second coat makes a smooth, even finish, which may be painted, grained, or varnished, as may be desired.

Fig. 1.

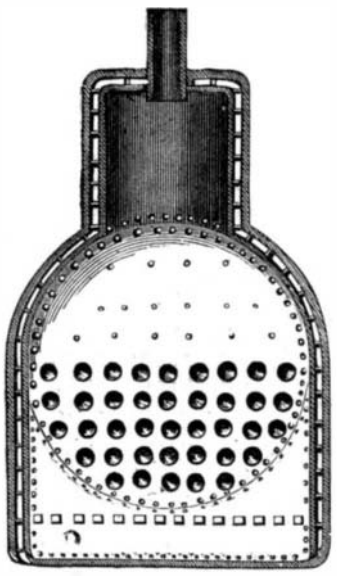
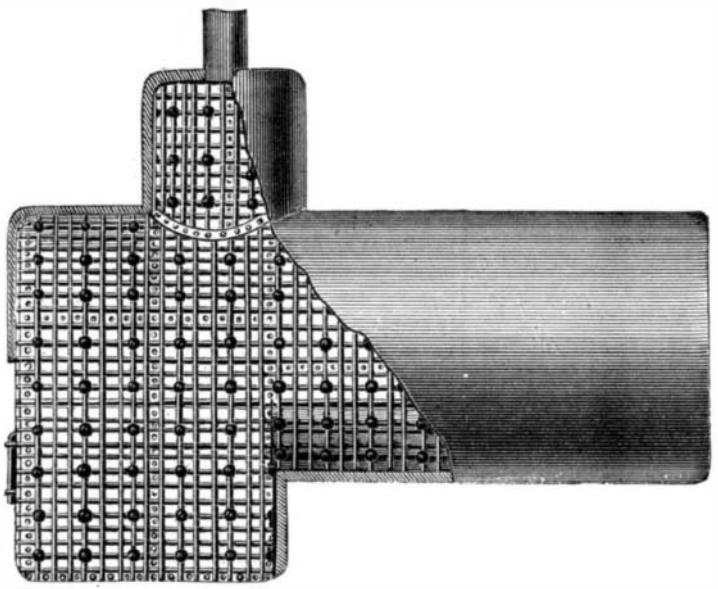


Fig. 2.



ASHCROFT'S BOILER COVERING.

There are many objections to applying a covering direct to the surface of the boiler, for it has been found, especially in marine boilers, that, when so covered, the inside as well as the outside of the boiler rapidly scales. The air space method, we are informed, is not open to these objections. On the contrary it keeps the iron clean and bright, besides preventing the radiation of heat and condensation of steam. Fig. 3 shows the application of of the invention to steam pipes. We learn that it is used extensively in the United States navy, the boilers of several of the largest steamers being thus covered. The Pacific Mail Steamship Company have also had the boilers in the last new steamers—City of Sydney, City of San Francisco, and City of New York—protected with the air space covering. It has besides, we are informed, been extensively applied to large manufacturing works in all parts of the country.

This method of covering was patented in June, 1866, to John Ashcroft, but has not been prominently brought before the public till within the past year, when the patent was purchased by the Chalmers Spence Company, of New York, who now apply it in connection with their non-combustible plastic covering. Their works in New York city are located at the foot of 9th street, East River, next to the Morgan Iron Works; and they may be applied to, at that address, for further information.

The Solar Eclipse of March 25, 1876.

It is quite possible that this eclipse, which is given as an annular one in the *Ephemerides*, may be total for an instant on the North Pacific Ocean in longitude 140° 16′ west of Greenwich, and latitude 35° 39′ north, or near this position it may prove one of those rare phenomena characterized in our text books as total without continuance. The central line traverses the southern and largest island of the Sandwich group, where the eclipse will be annular for a few seconds. At a point in longitude 155° 56′ W., latitude 19° 28′ N., the eclipse commences at 9h. 30m. A.M. local mean time, at 130° from the sun's north point towards the west (direct); and the annulus is formed, according to the *Nautical Almanac* elements, at 10h. 49m. 10s., and continues 10 seconds. This point is a little south of Kaavaroa, by the Admiralty chart, and close to the spot where the monument to Captain Cook was erected; the central eclipse leaves this island, Hawaii, near Manienie, also marked on the Admiralty chart of this group. The eclipse will be central and annular also in Vancouver Island and British Columbia. The central line appears to enter Vancouver at Refuge Cove, Sydney Inlet, leaving it at Orange Point, Duncan Bay, whence its course is to George Point, British Columbia. In Vancouver Island the annulus may continue 7 or 8 seconds, being formed about 0h. 27m. P.M. local mean time. At New Westminster, British Columbia, calculation gives a large partial eclipse commencing at 11h. 22m. A.M., and ending at 2h. 3m. P.M., local times, magnitude 0·95; here the first impression of the moon upon the sun's disk is made at 127° from his north point towards the west. For further information on the track of the central line over these parts the large Admiralty chart of Vancouver Island and vicinity should be consulted; the above names of points traversed by the central eclipse are taken from it.

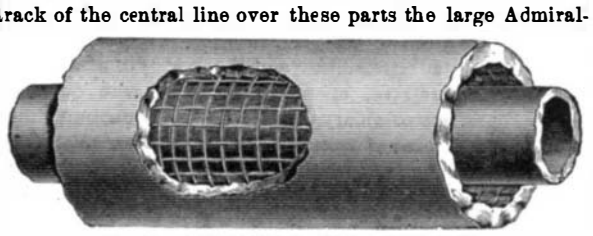


Fig. 3.—ASHCROFT'S PIPE COVERING.

On the central line this eclipse must prove one of very considerable and unusual interest.—*Nature.*

THE proper velocity for the periphery of a circular saw is nine thousand feet per minute, or one hundred miles an hour. A saw 12 inches in diameter should make 3,000 revolutions per minute.

Coal Dust Fuel.

The grounds on which are erected the works of the Loiseau Pressed Fuel Company belong to the Philadelphia and Reading Railroad Company, and have been leased for five years. All the coal dust made at the wharves at Port Richmond, Pa., during the same number of years, has been secured by contract. When the works are started, if the supply at Port Richmond is not sufficient, additional quantities, as required, will be shipped from the coal regions. The buildings are erected at the southwest corner of Bath and Linden streets. Their length on Bath street is 128 feet, and on Linden street 275 feet. They are seven in number.

The clay is dried in a kind of core oven, and is ground by one of Baugh's grinding mills. In the same room is an iron tank, six feet high and six feet in diameter, in which is prepared a composition of lime, rye flour, and water, which, in a liquid state, is discharged into a wooden reservoir or tank placed under the coal dust and clay pockets. In front of these pockets is placed a very ingenious machine by means of which 95 per cent of coal and 5 per cent of clay are continually and mechanically taken out of their respective pockets and delivered under a chain elevator, and there sprinkled, through a perforated pipe, with the liquid from the wooden reservoir. All the materials which are to make the lump of fuel are here brought mechanically together and are taken up by the chain elevator, which carries them up and discharges the whole into the mixing machine. This machine has a capacity of six tuns, and it delivers through two openings at the bottom, regulated by hand wheels, the materials on a leather belt, 3 feet wide, which carries and discharges them into the hopper of the press, between two rollers, on the face of which are milled out semi oval cavities, connected by small channels. These are the molding rollers, and the materials passing between them are compressed and molded in the shape of eggs, and delivered in that shape on an endless wire cloth belt, which enters the drying oven on top. In this oven, which is a brick construction, 86 feet long, 14 feet wide, and 26 feet high, there are five endless wire cloth belts, geared together, and traveling in opposite directions. This oven is heated, by a fire placed at each end, to from 250° to 300° Fah. The coal enters, as said before, on the upper belt coming from under the press, travels five times in succession the entire length of the oven, at the speed of 12 feet in one minute, falling from one belt to another, and finally comes out perfectly dry on the lower wire cloth belt, which enters the waterproofing building. In this building the lumps of coal are discharged into a tank containing a certain liquid composed of candle gum dissolved in crude benzine. In the same tank, and guided on both sides by a curved groove, travels a wire cloth belt on which the lumps are discharged from the lower belt coming from the oven. The lumps are thus immersed mechanically into the waterproofing liquid, while the belt describes a curve into the tank; and the same lumps are then carried, waterproofed, into the evaporating oven, where all the vapors of the benzine are collected and carried through large pipes into a condensing coil 200 feet in length. The condensed benzine returns to the main tank, and the coal, perfectly dry and waterproof, is carried up by a chain elevator, and discharged on another wire cloth belt, which runs the entire length of the coal pockets (100 feet), and delivers the coal in any desired pocket.

From beginning to end the coal is in motion, from the point where it is dumped as dust until it reaches the coal pockets as fuel. It travels about 800 feet, in about one and a half hours. Buildings and machinery are of the most substantial character. The production with the machinery erected will vary from 125 to 150 tuns per day.—*Saward's Coal Trade Journal.*

American Salmon in New Zealand.

Intelligence has been received of the safe arrival in Auckland, New Zealand, of 40,000 salmon eggs from Columbia River. These eggs were sent from San Francisco by steamer, consigned to the Napier Acclimatisation Society; but on arrival at Auckland they were found to be so far advanced that it was determined not to risk sending them all to Napier, but to distribute them immediately in suitable localities in the neighborhood. One half was thus treated, and the remaining 20,000 were sent on to their original destination, Napier. There is every probability that an actual colony of salmon has now been planted in New Zealand, for the fry were in a healthy condition, and great care was taken by Mr. Firth to protect those placed in the rivers from all enemies.