riage; sixteen 32-pounders, 32 cwt., 6 feet 6 inches, on Hardy's carriages. Forecastle: one 68-pounder, 90 or 95 cwt., 10 feet, on pivot slide and carriage. Total, 46.—Amphion, 300 horse power. Main deck: fourteen 32-pounders, 56 cwt., 9 feet 6 inches, and six 8-inch guns, 65 cwt., 9 feet, on common carriages. Quarter-deck: one 68-pounder, 90 or 95 cwt., 10 feet, on pivot slide and carriage; eight 32-pounders, 25 cwt., 6 feet, on compression carriages. Forecastle: one 68-pounder, 90 cwt., 10 feet, on pivot slide and carriage. Total, 30.

This return does not include the numerous packets that ply as mail steamers on the various stations round the coast and in our colonial possessions.

Civ. Eng. & Arch. Jour.

Copper Wire Rope Lightning Conductors.

(With a Plate.)

SIR,—I herewith send you an abstract sketch and description of my Patent Copper Wire Rope as Lightning Conductors, and ordered to be adopted in the Royal Navy, of which a considerable number of ships have been fitted, besides a much greater number in the merchants' service; the advantage of these conductors consists in their efficiency, economy, and easy application—the perfect continuity, by means of the copper wire line, from the *truck a*, plate v, figs. 6 and 7, at the top-gallant mast-head, passing down the top-gallant mast—then down the *after* top and lower mast shrouds to *c*, below the water-line, as shown on the sectional sketch, which carries the electric fluid clear off the ship, into the water, without injury; the time required for fitting a ship with this conductor is only a few hours, and the expense, including the fitting, is 9d. per foot; if all three masts are fitted, the expenses are about 12*l.* for large class ships—if main-mast only, under 5*l.*—small vessels less in proportion.

The accompanying testimonials, from amongst several, will satisfy you of the efficiency of these conductors:—

Liverpool, August 20, 1842.

SIR,—I have used your Patent Copper Wire Rope Lightning Conductors for three years, and approve of them; the ship I command was struck laying in New York—the electric fluid passed down the conductor to the water, without injury to the spars or hull.

(Signed) J. C. DELANO,

Commander of the ship *Patrick Henry*.

Mr. Andrew Smith.

The following is an explanation of the mode adopted in her Majesty's Navy, for the application of Andrew Smith's Patent Copper Wire Rope, as Lightning Conductors, as issued from the Admiralty, Somerset House:

“Instructions for Fitting Ships of War with Copper Wire Rope, as Lightning Conductors.”—From the truck to the cap of the lower mast-head a wire rope conductor, of three-eighths of an inch in diameter, is to be fitted, secure to the truck, as at *a*, leading down the top-mast shroud to the lower mast-head, and in contact with the *after*

shroud, to the link of the dead eye and ship's side, *d*, whence it is connected to a copper-plate (fig. 8) of $2\frac{1}{2}$ inch broad, three-sixteenths of an inch thick in the middle, rounded off at the edges—inserted into the ship's side; care is to be observed that the edges are well let into the wood, and that the plate is brought into close contact with the copper sheathing on the ship's bottom, extending, at least, to the depth of one sheet below the water-line. The top-gallant mast is to be so fitted with the truck, as to admit of its being struck without the removal of the conductor from aloft, as it may be coiled and left at the top-mast head while the mast is on the deck. The flying jib-boom is not to be fitted in any ship—and in smaller vessels (single deck) the bowsprit need not be fitted."

The annexed certificate has been received from Capt Crawford:—

"The ship *Blakely*, of Liverpool, belonging to Messrs. Taylor, Potter, & Co., left Liverpool in the month of February, 1841, bound to China, fitted with your Copper Wire Rope Lightning Conductor on the main-mast, from the main-top-gallant-mast-head down to the main rail, and from thence to the copper. The captain was made acquainted that the main-mast was protected, but the royal-mast *was not*—and for him, the first opportunity he had, to put the copper wire rope from the conductor to the truck, which he did not do. When the ship arrived off Java Head, she encountered a severe storm of thunder and lightning, which struck the main-royal-mast, and shivered it all to pieces; the lightning then descended by the conductor into the water, to the astonishment of all on board—doing no other damage to the ship. I am happy of having an opportunity of making you acquainted with the circumstances. I hope it will stimulate other ship owners to imitate the house of Messrs. Taylor, Potter & Co., whose ships have all been fitted by me with your Copper Wire Rope Lightning Conductor."

ANDREW SMITH.

*Patent Galvanized Iron and Wire Rope
Works, Millwall, Poplar, Jan. 27.*

Lond. Min. Jour.

Gases and Explosions in Collieries.

Continued from Page 363.

The Committee of 1835 pointed out that more persons had lost their lives from colliery explosions for the 18 years succeeding the introduction of the Davy safety lamp in 1816 than in the 18 years preceding the invention, and accounted for this fact by the working of numerous "fiery" seams of coal, which had, in consequence of the assumed security of that lamp, been undertaken, and by the abandonment of many precautions considered requisite when candles were commonly employed in collieries.

As much doubt has been thrown upon the real safety of the Davy lamp, it is but justice to the memory of Sir Humphrey Davy to state that he was perfectly aware that, if a proper mixture of fire-damp and common air were thrown against the lamp with sufficient force to pro-