and the whole activity of the yard appears concentrated on the two armoured ships which are in the process of construction, and in the shops where their component parts and plates are being shaped and fitted.

Entering the yard we pass storehouses and workshops that give out no signs of life under the change, and the slips where a despatch vessel and other small craft are standing. Next is No. 1 dock, built for the reception of small vessels, but which has been covered on a level with the soil, and roofed over to serve as a fitting shop for the "Achilles," iron ship, which is building in the dock No. 2 alongside. It is here that the frame of the ship is prepared and fitted in parts before being built up. The frames, which answers to the ribs of timber ships, are composed of bars of angle iron, from ⅝ to 11-16ths of an inch thick, riveted together and bent into the desired shape. For this purpose a modern mould is made to each frame—that is to say, thin boards are sawn out to represent in their convexity the sectional lines of the ship. On the floor of the shop is the "levelling plate." It consists of massive iron blocks, pierced with numerous holes disposed quincancially, and solidly bound together to form a levelling plate of sufficient thickness. Opposite and close to one end is a pair of hot air furnaces for heating the angle iron. They both communicate by flues with one chimney, and other arrangements are adopted to ensure an economy of fuel, as well as the uniform and quick heating of the bars of angle iron. The furnace itself is at the end opposite the door, and in one case there was a furnace in either of the longitudinal sides. The heat and products of combustion pass from the furnace over the brick bed on which the bars are placed, and escape by a return flue to the chimney. The brick roof being arched, throws down the heat upon the iron. When the bar has been raised to the requisite temperature it is withdrawn, and laid on the levelling plate, whereon the sectional line or form of the set has been previously marked by pins inserted in the holes of the levelling plate. Then with hammers, tongs, and hand-spikes, the bar is rapidly bent to the required form. The turning up the portion resting on the plate is remedied by flat-headed punches, fastened to long withy handles, held by workmen, while others strike the punches on the head with huge sledge hammers until that portion of the bar is levelled. It cannot fail to strike the spectator that this mode of curving the frames is unnecessarily tedious, costly, and requires a degree of human labour unsuited to the inventive genius of the age —so fertile in contriving labour-saving machines. There can surely be no difficulty in devising a machine which would roll the bar to the sectional line in one operation, and in no more time than it takes to write this sentence. If a pair of rollers—one vertical to bear upon the portion of the bar resting on the levelling plate, and the other horizontal, to bear upon the upright portion behind, which are the pins—were placed in connection with a mechanical arrangement which would make them follow varying curves—an arrangement, in fact, something of the character of a pentagraph—then the operation would be simplified, and more expeditiously performed than now, when a dozen or fifteen men are required to bend a bar by dint of sledge hammering, for then all that would be required would be a sufficient number of hands to draw the bar from the hot-air furnace by an overhead traveller, and to arrange the pins according to the curve, while one man at the other end of what, for lack of better name, must be called a pentagraph, would suffice to cause the rollers to travel in the curve of the sectional line, as will be easily understood. It matters not whether this or any other mode be adopted of rolling the bars of angle iron into any curve that may be required; the essential point is to introduce machinery to shape the frames so that they may be more accurate, take less time in their production, and cost less money.

Each frame or rib is composed of two or more bars of angle iron, held together by "boiler riveting," so as to support the iron skin, teak backing, and armour plates on the outside, and supports for the planking inside. The frames for the stem and stern are more complicated, and composed of a greater number of bars, but the system of construction is the same; the rivet holes in the frames are punched out by the ordinary machinery, and the rivets are hand-fastened while cold, and this, although Fairbairn claims for machine-riveting a superiority of from 4 to 5 over hand-riveting. When finished so far, the frames corresponding are temporarily fitted together, and the parts carefully adjusted; after which they are placed in the positions they are permanently to occupy—the ship being built in sections. The beams are of iron rolled into the shape of double flanged girders. The combination of angle iron undoubtedly gives frames of great strength, but still, to the eye, a thickness of ⅝ of an inch appears slight when we remember the enormous weight they have to bear of armour plates, teak backing, skin, and outside planking. True, the frames are very close, and so would compensate for their apparent slightness.

The next point of novelty and interest is the preparation of the armour plates and their fixing to the ship's sides. They are manufactured by the Thames Ship-building Company, and are said to be superior to all others in quality, homogenity, and toughness, that have been sent in from the great centres of iron manufacture. If so, and there appears no reason to doubt the statement, the fact is noteworthy, as showing how good workmanship will overcome the disadvantages of increased cost of labour, raw materials, and fuel. As compared with northern iron manufactures, the Thames Company pays double the price for fuel, a fifth more for wages, high rent, and the carriage on raw material; while from the north the carriage is paid on the manufactured product. To judge from their working, the plates are of an unusually excellent quality. Their weight averages 3½ tons, including the large ones for the broadsides, and the smaller ones for the bows and quarters. The thickness of the first is 4½in., while the second, which present oblique surfaces to shot, are less.

The first step to putting on the ship's armour, above the iron skin, bolted to the frames by hot rivets, and a teak backing, 8 in. thick, overlaying the the skin, is to take a mould of the curved surface of that portion of the ship's side to which the armour plate is to be adapted. These moulds are taken in thin planks for the horizontal and vertical curves—that is to say, for the curves to be given to