In a warship the arrangement is different, as it is necessary to keep the steering gear below the water-line for protection. The breadth available at the rudder head is as a rule not sufficient for a tiller or quadrant to be fitted. Fig. 124 illustrates an arrangement frequently adopted. A crosshead of sufficient size is keyed on to the rudder head, and is worked by connecting rods from a similar crosshead placed a little farther forward, where the breadth of the ship is sufficient to allow a tiller to be worked. The tiller is worked by a block or carriage, which is drawn across the ship on a guide, at the same time sliding upon the tiller, which is machined for the purpose. The block-and-guide arrangement is known as Rapson’s slide. The block is hauled to and fro across the ship by a chain which passes round a sprocket wheel upon a shaft, which is driven in either direction, as required, by the steering-engine. In fig. 125 the arrangement is shown which has been for a considerable period adopted in large merchant ships and has in recent years been adopted in ships of the British navy. It is known as *screw steering gear.* On the same central shaft there are right- and left­handed screws as indicated on the plan, by which blocks A and B are made to travel always in the opposite direction when the shaft is rotated. These actuate the crosshead on the rudder E by means of the rods C and D, one of which will communicate a thrust and the other a pull, and vice versa according to which way the shaft is made to rotate. The shaft may be actuated either by hand-gear or by steam by means of the clutch F. In many cases the steam steering-engine is placed in the engine-room, to avoid heating the after-compartments by the steam pipes, and for the sake of easier control by the engineers.

Amongst the auxiliary machinery usually fitted in passenger and other well-found vessels may be mentioned the windlass for working the cables and weighing the anchors; a warping capstan forward in connexion with the windlass, and another aft with its own engine; steam winches for handling the cargo and baggage, and for hoisting coals on board; and occasionally steam cranes, fitted either in addition to or in place of the winches. Then there are the electric light, pumping, ventilating and refrigerating installations. Hydraulic power is employed in many cases, especially for cranes, but here the source of the power is necessarily a steam engine, which is usually placed in the main engine-room. Electric power sometimes replaces steam for operating some of the machines enumerated above; for instance, ventilating fans are now generally driven by electric motors in passenger and war ships. A large number of comparatively small fans are used, each supplying air to a particular part of the ship.

In warships the amount of auxiliary machinery has been very greatly increased in recent years. On each side of the deck amidships there is generally a steam winch for raising and lower­ing the boats, one of the principal functions of the mast in the modern warship being to carry the derrick used for this purpose. Electric motors are fitted for working the after-capstans, ash hoists, sometimes the winches, and the workshop machinery; also to traverse, elevate and work the guns, and bring the powder and projectiles up from the magazines to the guns. But for the heavier guns, the steering-gear, and certain other purposes, hydraulic power or steam is still preferred.

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**SHIPKA PASS,** in Bulgaria, a pass in the Balkans, celebrated as the scene of fierce fighting in the Russo-Turkish War of 1877-78. The main road from Rumelia to Bulgaria, leading from Sistova by Tirnova and Eski Zagra to Adrianople, crosses the Balkans near the village of Shipka, and this passage was of necessity an important point in the Russian plan of operations. The road does not pass between high peaks, but crosses the main ridge at the highest point ; it is therefore not a pass in the ordinary sense of the word. Near the summit, running parallel, and close to the road is a series of three ridges, some 200 ft. high, and about 2 m. from north to south, which formed the position for a force holding the pass. It was originally held by a Turkish force of about 4000 men with 12 guns, prepared to resist the Russian advance. On the 17th of July they repelled a feeble attack from the north, and the following day faced round and drove back an attack by Gurko from the south. These attacks were to have been simultaneous, but Gurko, having met with unexpected resistance, was a day late. Though so far successful, the Turks evacuated their strong position, and it was occupied by the Russians on the 19th of July.

They were first attacked by Suleiman Pasha towards the end of August. Having concentrated with Reouf Pasha and driven Gurko across the Balkans at the end of July, he moved to the Shipka on the morning of the 21st of August, and attacked. The Russian force there, including five battalions of Bulgarians, then numbered 5000, but that day a regiment from Selvi brought their numbers to 7500, and this force held the position against 30,000 Turks for three days, when heavy rein­forcements arrived. The fighting continued till the morning of the 26th, when Suleiman, his troops being exhausted, and having lost 10,000 men, entrenched him­self in the position he then occupied in a semi-circle round the southern end of the Russian position. Having called up more battalions from Yeni Zagra, after a four days’ artillery bombardment, he attacked on the 17th of September, and was repelled with a loss of 3000 men.

There was no more fighting on the Shipka till the general advance of the Russians after the fall of Plevna. Radetzky’s command of about 60,000 men advanced from Gabrova on the 5th of January, in three columns. Radetzky, with the central column, moved by the main road and attacked the Turks, who still faced the position on the summit, while Skobelev and Mirski, crossing by trails some 3 m. to the west and east of the Turkish position, attacked their reserves on the far side, about Shipka and Shenova, where Vessil Pasha (who had succeeded Suleiman in command) had formed an entrenched camp. These flank columns made their way over the mountains, deep in snow. Mirski attacked alone on the 8th of January, as Skobelev’s advance had been delayed, but the following day both columns attacked, and after fierce fighting the Turks surrendered. The force on the summit had that day repulsed, with heavy loss, a frontal attack by Radetzky, but they were included in the surrender. Their numbers were 36,000, including 6000 sick and wounded, and 93 guns. The Russian losses were 5500.

Not only were the Turkish attacks on the Shipka unsuccessful, but they were made without object. At the end of July, when Suleiman forced Gurko back over the Balkans, the moral equili­brium and the plan of operations of the Russians had been upset by the second battle of Plevna, and the Shipka ceased to have any strategical importance for the time being. Had Suleiman at that time followed up Gurko and joined Mehemet Ali, or moving round acted with Osman against the Russian flank, the evacuation of the Shipka would have been compulsory. Suleiman, knowing nothing of strategy, preferred to act independently, and his action was supported by the still more ignorant ministers at Constantinople. The Shipka was merely a geographical point until the Russians were prepared to advance, but, fortunately for them, the Turks chose to waste an army in fighting for it throughout the critical period of the operations. As with Osman at Plevna, it was Constantinople that forbade Vessil