

The engine is operated to draw the truck toward the end of the boom, while the horizontal component of the hoisting ropes brings the truck in toward the tower when the clutch and brake are released. The engine may, however, be operated to draw the truck to its inmost position if desired. This engine is also fitted with solenoid and load brakes. The reduction gears are enclosed in an oil-tight case, have cut teeth, and run in a bath of oil.

Fig. No. 8 illustrates the third engine employed to operate the auxiliary hoist for placing slings under the loads of package freight. The hoisting rope is led directly from the engine to a sheave in the rear of the boom, thence forward to a block suspended by a slide from the underside of one part of the boom. The rope is then led around the running block in the usual manner. This slide is moved along the boom and held in any position by a continuous rope running over sheaves at both ends of the boom and operated by the winch head on the engine. The engine is also operated by a 25 h.p. railway type motor mounted on springs. The hoisting drum is controlled by a conical friction clutch and band brake in the usual manner.

The construction and operation of the crane boom merits especial attention. It consists of two symmetrically disposed parts, each composed of an I beam and a channel well braced together. The parts are rigidly connected together at the ends, but throughout the traverse of the boom truck are separated to admit the passage of the hoisting ropes. The truck runs on rails placed directly upon the I beams. As shown in Fig. No. 3 the boom extends to the extreme rear of the tower where the horizontal thrust due to the weight of the boom and the tension in the trolley ropes is carried by a heavy girder. The guy ropes always occur in pairs in order that the hoisting ropes may traverse the length of the boom between them, and they are so attached that the respective halves of the boom are balanced under load and do not twist. They are provided with turnbuckles near the head of the tower for adjustment.

The boom is hinged for vertical movement at the rear and at a point just forward of the front legs. This construction permits the boom to be folded to clear the vessel's rigging, as shown in Fig. No. 4, by means of blocks attached to the outer boom hinge and to the tower near its head and falls operated by the small drum on the main engine. The position of the outer hinge is so chosen that but slight additional weight is required to cause the boom to resume its normal position when the hoisting ropes are released. This additional weight is supplied by the boom truck which, when the boom is folded, lies in a pocket formed by bent ends of the rails on the rear of the boom, and by the forked brace at the rear, as shown in