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Cover story

Contemporary industry and especially developing building and highway engineering requires the transfer of significant mass of goods and raw materials. The important branch of manufacturing industry is then companies which manufacture cranes and other technological transport equipment. The fundamental constructional material used to manufacture cranes including hoists and overhead travelling cranes is weldable high-strength low alloy steel having high yield point, often manufactured



by the use of regulated rolling or controlled recrystallisation in the form of sections and also pipes out of which complex constructions are welded. That equipment can be stationary or mobile. Special subgrades used for that aim consist of the set of rails made out of rail steel and steel wheels often surface hardened at side surface switched on rails, for example with the use of laser remelting, metallisation or other methods of surfacing by welding. In a case of a caterpillar driver segments of huge caterpillars not rarely made out of Hadfield austenitic steel strengthened under the influence of cold works. Self-propelled equipment are wheel driven with rare high tread tyres made out of elastomer matrix composite materials of synthetic rubber reinforced with steel cord. Such equipment can have a hydraulic lifting system which is not characterised by truss structure but in turn consists of a hydraulic system of controllers which elements are made of welded steel usually micro-alloyed ones in cylinders, pistons and piston rods very often have surfaces with suitable combinations of galvanic coatings ensuring required smoothness and after the use of suitable elastomer materials seals also leak tightness of hydraulic systems. So called counterbalance of cranes can be made of cast steel, cast iron, concrete blocks stacked at the opposite side of a jib ensuring stability after full load. Cranes usually consist of system of steel lines most often including single wires, very often shaped ones, often galvanised, suitably intertwined, not rarely into cables or bundles out of which only then a line is created on which a lifting sling, which can have different constructions including electromagnetic, mechanic, hydraulic ones or others or a scoop or so called a bucket in a case of loading loose materials usually having teeth made of Hadfield cast steel. Building tower cranes require the assembly with the use of travelling cranes or after previous use of a travelling crane can be assembled by the use of a telescopic cage situated near a crane top tower with a hydraulic lift inside it, enabling successively pushing out successive segments into suitable places and then lifting them up each time for one segment, making possible autonomic raising of a crane height in each necessary case. Crane tower segments are joined together with a use of rods and steel crew and usually are anchored aside to a built building, although cranes can be also travelling ones. Big gantry cranes are applied for example in container depots in ports, metallurgic factories, scarp and carbon yards. As almost in each volume of Journal of Achievements in Materials and Manufacturing Engineering, also in the present one, at least a few papers deal indirectly and directly with materials or technologies which can be used for manufacturing cranes as important mechanical equipment.