IMPROVED COMBINED SHEARS AND PUNCH.

The machine tool shown in the accompanying illustration is given to show the prevailing European style. It has been designed in view of quickly satisfying certain constantly occurring needs connected with work in large naval establishments, boiler manufactories, etc.

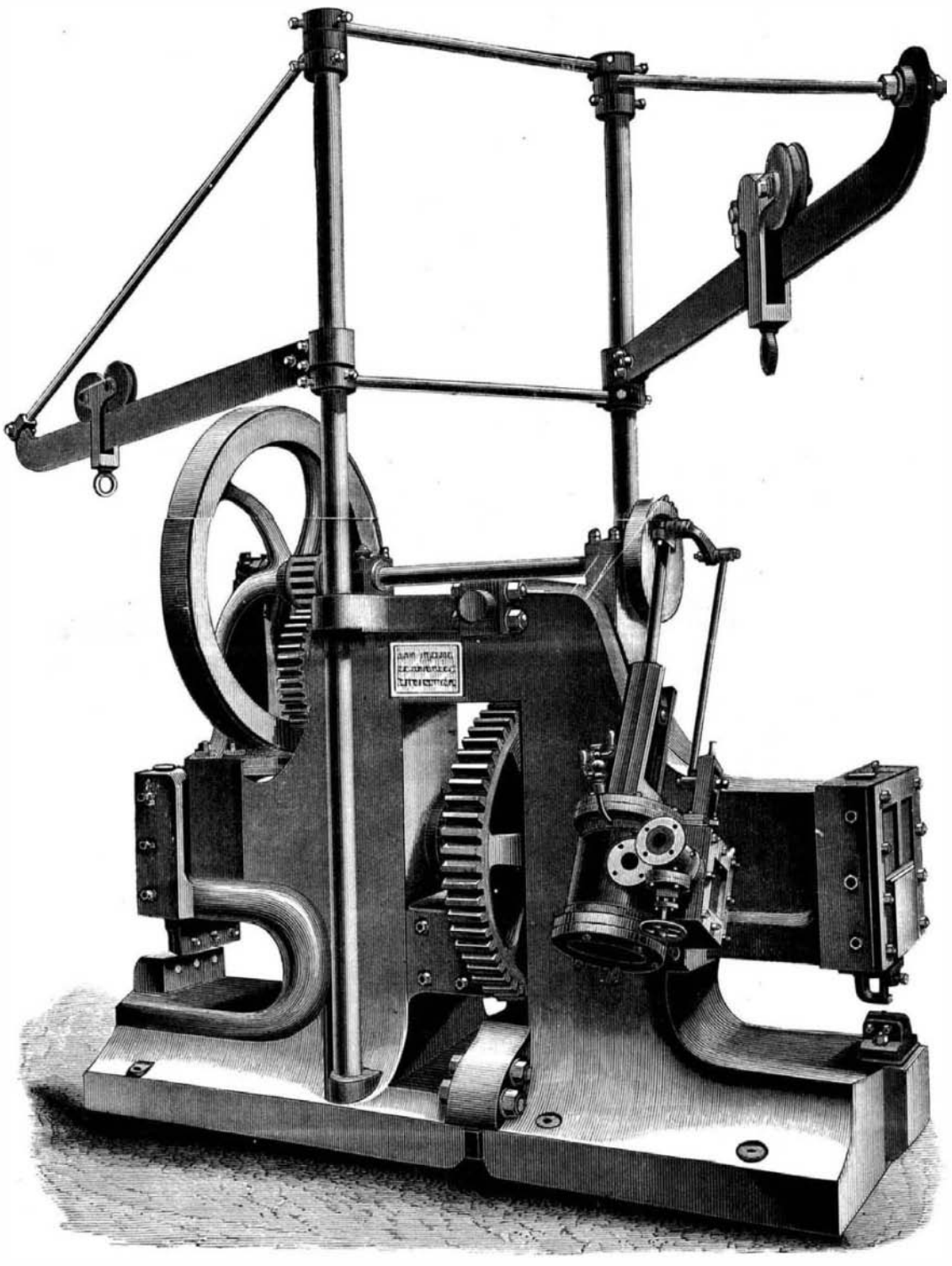
It consists of two solid frames connected together by means of eight large bolts and of wrought iron hoops put on while hot. These frames are hollow in the interior, and each elbowed extremity is strengthened by strong ribs.

A punch and shears are arranged symmetrically upon the machine· and, besides these, shears for cutting angle irons are fixed longitudinally in the space between the frames. The motive power is furnished by an independent steam engine, which is fixed to one of the sides of the punch. The piston of this motor is 260 mm. in diameter, and its stroke is 400 mm. The connecting rod is pivoted to a crank plate which is supported by the driving shaft. This latter runs in three pillow blocks provided with bronze bearings, one of them being in front of the flywheel. The transmission of motion for actuating the tools is effected by means of doubles gearings, whose teeth have been moulded and cast with the greatest care. The last wheel sets in rotation a longitudinal shaft which carries three eccentrics for actuating the shears for cutting iron plate, those for cutting angle irons, and the punch, respectively. This shaft revolves in boxes lined with hardened cast iron. The tool carriers slide in large guides, which are adjusted with care, and which can be regulated by means of screws. Each of them is provided with an easily maneuvered starting gear. To the sides of the frames there are fixed upright columns, which are strongly cross braced and carry wrought iron cranes for holding and manipulating the pieces of iron to be cut or punched.

The opening in the shears frame (figured to the left in the cut) is 0·7 m. in depth, and permits of cutting in a longitudinal direction, and into two equal parts, sheets of iron as much as 1·4 meters in width. The blades are capable of cutting through metal 32 mm. in thickness.

The longitudinal distance of the axis of the punch from the frame is 0·65 meter. This tool is capable of punching holes 38 mm. in diameter through iron plate 32 mm. in thickness. Finally, the central shears are arranged for cutting through angle irons whose sides have, at a maximum, a width of 150 mm.

This machine has a total weight of nearly 17 tons. It has already received three applications in ship building establishments in Northern Germany, and is one of the largest multiple machine tools in use.—*Revue Industrielle.*



IMPROVED COMBINED SHEARS AND PUNCH.

An English Express Locomotive

A correspondent of the *Railroad Gazette* says: A passenger engine on the London and Northwestern Railway has recently run 151,000 miles in 15 months. This was chiefly composed of daily trips from Manchester to London and back, a distance of 375 miles. The engine has cylinders 17 inches by 24 inches, four wheels coupled 6 feet 6 inches diameter, and a pair of leading wheels which accommodate themselves to curves by means of a lateral motion, which is regulated by double inclined surfaces on the top of the axle boxes and through which the weight is transmitted from the springs. This gives a slight flexibility to the wheel base. The load taken was very regular, and consisted of about 100 tons for more than half the journey, and about 150 tons for the remainder. During the 15 months all the wheels were turned and the axle boxes metaled up; and at the end of the period the engine was sent into the shop for a fortnight, when the chief repairs consisted of a new set of tubes, and the engine was again placed on her usual run of 375 miles daily, and bids fair to have completed her 200,000 miles at the end of this year. The engine is worked by one crew of men only. The boiler is kept in excellent condition by being blown out at the end of every trip, and is filled up by means of its own injectors using steam from a stationary boiler in the engine shed.

It is interesting to note that the hard deposit of scale in the boiler and the corrosion of the plates has been very much reduced in this and similar boilers by inserting a block of zinc. In this manner it is found that 20 pounds of zinc dissolves every month in a boiler undergoing hard work. But the absence of corrosion and the readiness with which the scale falls off amply repay this expenditure of zinc. The engine above mentioned was built at Crewe, in March, 1882, and is of the ordinary straight link type.

Wood Paving in Paris.

After giving macadam and asphalt a fair trial to replace the stones in the streets of Paris, wooden pavements to a very limited extent were resorted to some few years ago by way of experiment, but they turned out a failure. An English company, however, came over to show the Parisians how the thing is to be done. About a third of the Champs Elysees was last autumn paved with wood by the English company, and the result has been so encouraging that the Municipal Council of Paris have resolved to give the English system a more extensive trial. The French, who are quick to copy, are hard at work in paving some of the principal streets, such as the Rue de Rivoli, the Boulevards, Faubourg St. Germain, and the remaining portion of the Champs Elysees, and it is pleasant to see French and English workmen employed so harmoniously together.

Quassia Chips in Beer.

In the neighboring town of New Britain there is a factory for the production of quassia cups—the quassia wood being so intensely bitter that a cup of fresh water, if it is a quassia cup, will become very bitter in one minute, and these cups long have been in use in some families for this tonic quality they impart to water. The chips and shavings in the cup factory were thrown away or burned, until some of the lager beer brewers discovered that they were available in the place of hops for lager beer; then a demand arose for them, until now the proprietor of the shop is making more money out of his chips and shavings than he is making out of his cups.—*Hartford Times.*

Remedy for Condensed Steam Showers.

In the business portion of many cities, during the winter it is impossible for a lady to pass through the streets without having her clothes sprinkled, and often spoiled, by the fair weather showers which she encounters beside every building furnished with an elevator or a high pressure steam engine of any kind, and other persons besides ladies feel the annoyance in a greater or less degree. The *American Architect* says: The remedy is so simple that it is a pity that its application should not be made compulsory everywhere, as it is in New York, where, notwithstanding a very general use of steam power in the business quarters, the exhaust showers are unknown. In that city no exhaust pipe is allowed under any circumstances to open directly into the atmosphere.

Where cheapness is the first consideration the law against open exhausts is complied with by placing an inverted cylindrical receiver or "kettle" over the mouth of the exhaust pipe, which projects just above the roof. The stream of mingled steam and water from the exhaust strikes the inside of the "kettle," and is there separated, the water attaching itself to the inner surface of the kettle, and dripping thence harmlessly upon the roof, while the light vapor, freed from its burden, passes off and is dissolved in the air. The use of these simple kettles, which cost but a few dollars, is open to the objection that the constant trickle of warm condensed water from them over the roof leads in time to the deterioration of the roofing material; and a better but more expensive device is used in many cases, consisting of a closed kettle, standing on the roof, and having its cover perforated with two holes, one of which receives the exhaust pipe, bent over and downward into it, while a short piece of straight pipe is inserted in the other. The exhaust steam is freed from its suspended water in this kettle, in the same way as in the other, and passes out as light vapor through the short pipe in the cover, and a small drip pipe leading from the bottom of the kettle conveys the condensed water into the nearest waste pipe or rain water leader.

The Coral Reefs of Cuba.

A study of the elevated coral reefs of Cuba has been recently made by Mr. W. O. Crosby, and his conclusion is that they indicate a slow subsidence of that island during their formation, and hence that Darwin's theory of the origin of coral islands is the true one. The reefs are in terraces along the sides of the island, especially on the northern and eastern sides of the island. The lowest terrace is 30 feet high, and varies in width from a few rods to a mile. It was obviously the fringing reef of the shore at one time. The second terrace rises abruptly from the level of the lower to a height of 200 feet to 250 feet. The third reef has an altitude of 500 feet; the fourth of 800 feet. These terraces run round the whole island, but are best preserved on the western part of the island, where the erosion has been less rapid, and on the summits of the highest hills. The hills about Havana and Matanzas, which reach a height of 200 feet, are entirely composed of reef limestone. In the mountain of El Yunque (the Anvil), five miles west of Baracoa, the reef stone is 1,000 feet thick, and composes the upper part of the mountain, the lower part being of slate and eruptive rocks. Originally the upper limit of this reef stone must have been 2,000 feet above the sea level. The Jamaica reef stones are of the same altitude, and it is probable that during their formation the Caribbean area was sunk until the Great Antilles were reduced to a few small islands.

ELEVEN new jute works are being erected in Germany, with fully 2,000 looms, and the new mills and extensions in Calcutta will add 3,000 looms to the present number, making a total of 5,000 additional looms in Germany and India.