

**IMPROVED PLATE BENDING MACHINE.**

At the Oldfield Road Ironworks have been produced recently some good specimens of plate bending rolls, some notion of which may be obtained by a glance at the annexed illustration.

The rolls are 18 ft. 6 in. long, the distance between the standards being 19 ft. The top roll is 27 in. diameter, and the two lower ones 19 in. diameter; these latter are fluted from end to end, to secure a better grip of the plates. From the great size of the top roll (the weight being 10 tons), it will be seen that special provision must be provided for raising and lowering, otherwise too much effort would be required of the workmen. The difficulty has been met by balancing this roll by means of two large pans suspended from the end of a suitable lever underneath the framework of the machine. On the opposite ends of these levers to the pans rest the vertical rods which support the top roll.

The leverage is about 4 to 1, so that with a weight of about one ton in each pan the roll will be practically balanced. The hand gear for raising the roll is shown in the illustration. We found on trial that it was comparatively easy to lift the roll, even with the balance weights removed, but the effort would be too great to expect of a workman continuously.

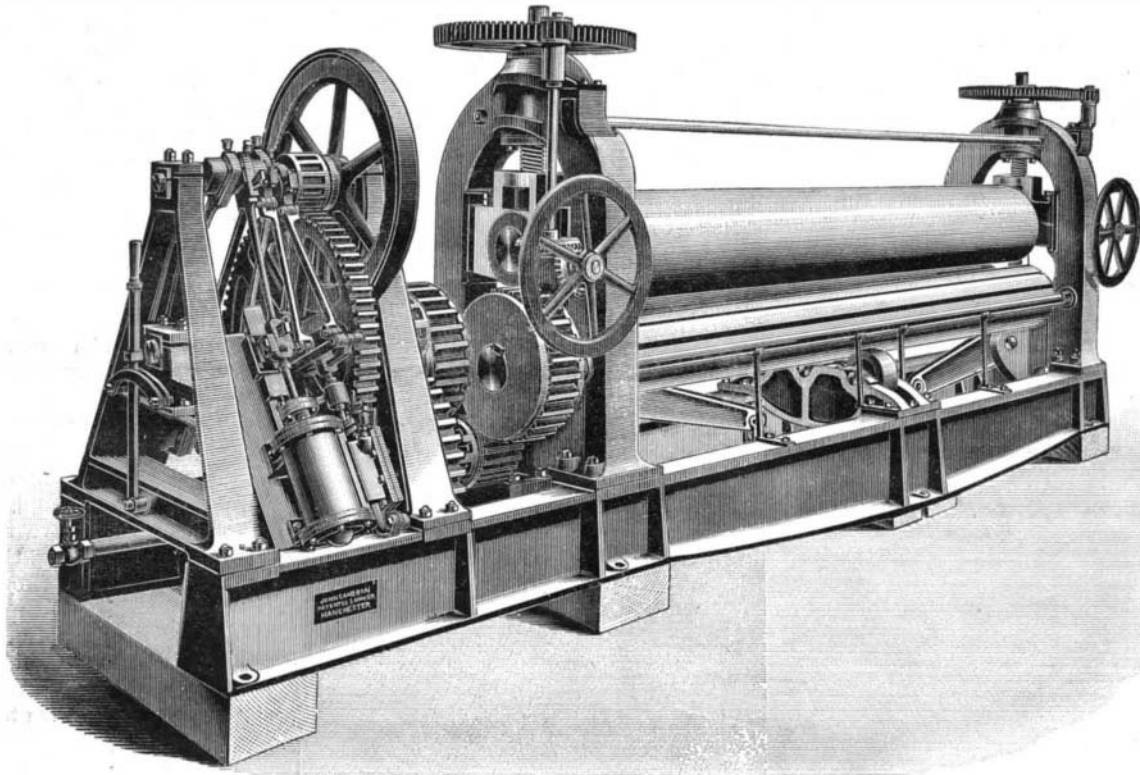
The upper roll neck is 10½ in. diameter, and the two lower ones 8½ in. A special feature of this machine is the manner of supporting the rolls in the center by means of three small friction pulleys; these are situated on a strong bridge bolted across the foundation frames of the machine, the latter being deepened in the center, as shown, to take up the strain thus brought upon them. The end frames are of box section 12 in. square, and are braced together near the top by a strong bolt in the center. We may mention that the friction rollers are 12 in. diameter and 6 in. wide, having bearings on each side 4 in. diameter and 6 in. long.

There are also provided, for the purpose of supporting the plates under operation, two strong rods running from end to end of the machine, one on each side of the lower rolls; these rods are themselves supported by four vertical brackets rising from the foundation beams, so as to prevent bending.

The bed frames are extended beyond the machine

proper, as shown on the left side of the engraving, and serve as a foundation for the engine; this plan makes the machine self-contained, and much more rigid than would be the case with separate foundations for the engine and rolls.

The engine has two cylinders arranged diagonally 8 in. diameter and 10 in. stroke, with pistons runnin



**AN 18 FT. 6 IN. PLATE BENDING MACHINE.**

at a speed of 300 ft. per minute, this speed being reduced by triple gearing to a speed of nearly five revolutions per minute of the rolls, or more accurately a circumferential velocity of 24 feet per minute. The gearing is exceptionally strong, the three pairs of wheels being 2 in., 3 in., and 4 in. pitch, and 4 in., 6 in., and 8 in. wide respectively; each of the three pinions is shrouded to the top of the tooth. From the last shaft in the above series each of the lower rolls is driven through a pair of wheels of 20 and 21 teeth respectively, shrouded to the pitch line.

Both rolls are driven from the same end, so that all the gearing is located in the same place, and secures the additional advantage of not having the same amount of vibration and jerking as is experienced when the rolls are driven from opposite ends by means of a long shaft traversing the length of the machine.—*Mech. World.*

**A NEW STEAM CARRIAGE.**

Street locomotion by steam has just made a great stride in the domain of practice. Hitherto, we have been accustomed to see heavy locomotives, weighing

several thousand pounds, hauling carriages at a speed much less than that of the horse, and resembling road-rollers for crushing stones more than anything else. Now, Messrs. Dion, Bouton & Trepardoux have succeeded in manufacturing steam vehicles of all sorts and of all dimensions, from the tricycle up to the largest omnibuses and merchandise vans. This result is the

outcome of their quick-vaporizing, circulatory, in-explosive boiler, which is applicable to all the industries in general, and which, although of slight bulk and weight, furnishes great power. Our engraving represents one of their steam phaetons—a vehicle of remarkable elegance, lightness, and strength. The frame of the apparatus is mounted upon four wheels. The two steering wheels in front are 2½ feet in diameter, and the two driving wheels 3¼ feet. Upon the frame, and in front of the driving wheels, are placed the box and two movable seats, back to back, capable of accommodating six persons. Over the driving wheels is the boiler, and, under the seat, the water tank. Behind the boiler are placed the coal bunkers, the feed apparatus, and the stoker's seat. Beneath the frame are arranged the cylinders, and the differential gear that

renders the driving wheels inter- and independent. The passenger to the right has within reach the steering and reversing levers, and can therewith steer, run the carriage backward or forward, and quicken or slacken its speed. The front platform is capable of serving as a support for a trunk or any other baggage. The carriage carries sufficient water for a run of twenty-four miles and enough coal for one of sixty miles.

The waste steam is dried before making its exit into the atmosphere, and is thus absolutely colorless. The carriage is capable of turning in a curve of 6½ feet radius. The boiler, which is 2¾ feet in height, has a heating surface of 58 square feet, and weighs, with its ash-box, its chimney, and all its accessories, 880 pounds. It takes no longer than ten or fifteen minutes after firing, to get up a pressure. The production is 14 pounds of dry steam per square foot, and 8 pounds of steam per pound of fuel.

The generator is of welded boiler plate without rivets, and is capable of withstanding the strongest shocks without its tightness being affected. It is tested to 44 pounds, and registered at 26. The engine con-



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