

THE ABBE FORGING MACHINES.

Since the introduction and adaptation of machinery in forging metal into regular and irregular forms, the inventors and manufacturers in the United States have expended much thought and money to produce special machines for special work to meet the requirements of the users, their aim having been to bring together as few pieces as possible in such machines, and do the work in as small a space as could be used conveniently to get at the parts for adjusting and removing for repairs. That our readers may judge how well this has been done, we place before them an admirable illustration of a mammoth bolt forging and rod upsetting machine, designed and patented by John R. Abbe, and manufactured by the S. C. Forsaith Machine Company, of Manchester, N. H.

This company has manufactured two smaller sizes of these machines for many years, they being known to the trade as the No. 1 Abbe header, working iron $1\frac{1}{4}$ in. diameter or under, and the No. 2 Abbe header, working $\frac{3}{4}$ in. iron and smaller sizes, and so well have these machines been received, both in this and foreign countries, that many inquiries have been received for one of greater capacity, to cover a wider range, such as bridge rods and for similar service.

In operation this machine is identically the same as the smaller patterns, the machine being held on separate base casting, without legs, bolting to the main bed of the machine, this giving a more extended bearing on the foundation, while on the left hand side, at the back end, two arms project each side of driving wheel, and on the end of these are bolted a pedestal for the outer bearing for the crankshaft, relieving the shaft from the strain caused by the extra heavy weight of the pulley and the strain of the belt. The floor space over all occupied by the machine is in length from front to back 12 ft. 7 in., the width 7 ft., and the height $5\frac{1}{2}$ ft., the distance from bottom of base to center of shaft being 34 in., and the shaft is of forged iron, 6 ft. 3 in. long, $5\frac{1}{2}$ in. in diameter, with three bearings, two on the main frame 12 in. long, and outer bearing on the pedestal $12\frac{1}{2}$ in. long, the distance from center to center of wrist pin being $3\frac{1}{2}$ in., giving the crosshead which carries the upset a horizontal

movement of 7 in. The driving pulley is of heavy balance wheel pattern, weighing upward of two tons, 6 ft. in diameter, 17 in. in width of face, with bearing of hub on the shaft 16 in. in length, the hub being bushed with composition so as to be removed and replaced when wear may occur. All sliding parts are gibbed as in the smaller machines, so any perceptible wear can be taken up at will, with gib and key connections, and

instance, one of these machines is in use in the shops of the Philadelphia, Wilmington & Baltimore R. R. Co., doing special locomotive, car, and bridge forgings, one class of forging being the punching of a slot 5 in. in length, $\frac{3}{8}$ in. in width, through a bar of 2 in. square iron, 8 in. long, the slot or keyway being made with one revolution of the crankshaft of the machine. In fact, the machine forges a wide range of special work, such as crank pins, lever handles, connecting pins, and, in fact, anything for which dies can be produced.

The superiority of these forging machines was well attested at the great exhibition in Philadelphia in 1876, when they were selected by the United States commission to illustrate the high order of bolt heading machinery used in this country.

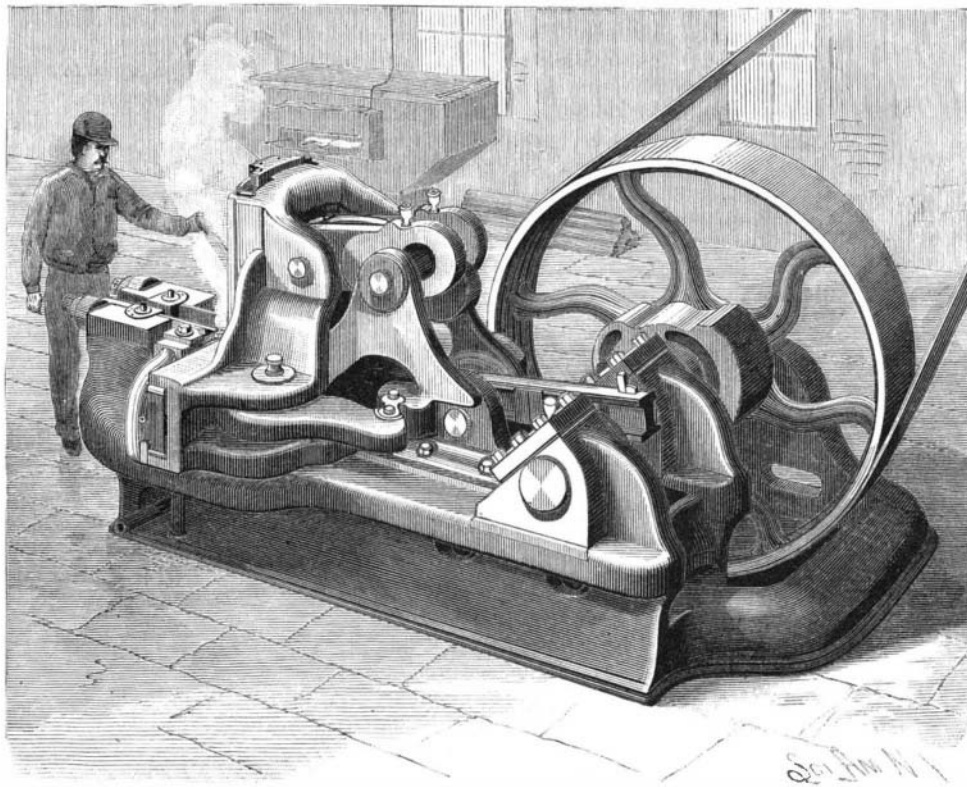
The machine from which the photograph was taken to make the cut has just been placed in the shops of the Roanoke Iron Works, Roanoke, Va., through the Niles Tool Works, of Philadelphia, Pa., and Hamilton, O.

ROAD LOCOMOTIVE FOR POSTAL SERVICE.

The engine we illustrate is one of several constructed by J. & H. McLaren for the *Fourgon poste* service in the south of France. This service is in the hands of different contractors, and altogether apart from the postal service of the state. It consists of the collection and delivery of parcels and light merchandise in districts remote from railways or indifferently served by them. Strange as it may appear,

many of the largest railway centers are also the chief centers of the *Fourgon poste* services, which collect their parcels in one town, and convey them by horse conveyance, and deliver them in another town many miles away, although there may be a direct line of railway between the two places. The excessive charges of the railways for goods carried *grand vitesse*, and the excessive time occupied in the conveyance and delivery of goods carried at *petite vitesse* rates, enables these contractors or carting agents to do a large business, many of them requiring several hundreds of horses for their work.

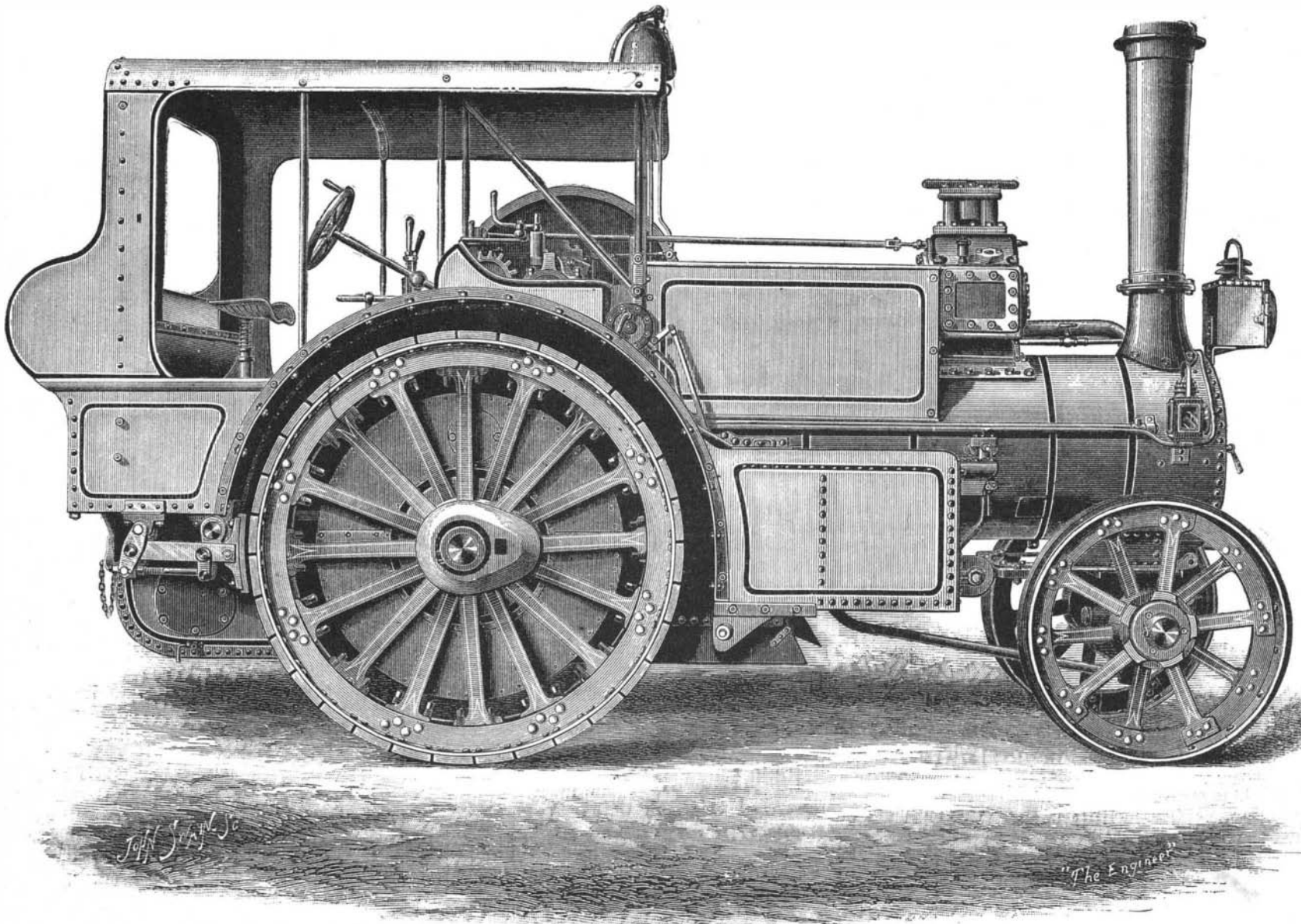
Some two years ago, Messrs. McLaren made one of their compound road locomotives, and tried it on one of



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the major portion of the small parts of the machine are of steel, the complete machine weighing 16 tons. The dies are wider than the bolt heads, leaving no fins upon the corners, while the holding dies leave the bolt exactly the size of the rod, while its working surfaces, all slides, and, in fact, every bearing upon the machine, are above the water, scale, and cinders that fall from the work—a notable feature possessed by no other machine, no gears, cams, or springs entering into the construction of the machine to cause repairs or noise when in use.

Its adaptability for other classes of work than bolts and rods is extensive, the great strength of the machine allowing a wide range in work performed thereon. For



IMPROVED HIGH SPEED ROAD LOCOMOTIVE, FOR POSTAL SERVICE.