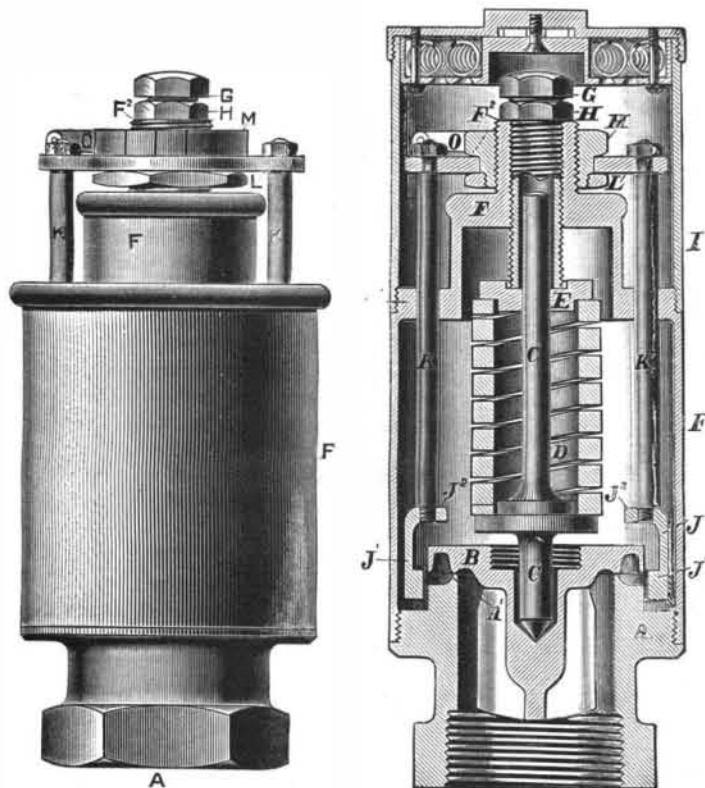


weight was an important element in view of the distance the bridge had to be conveyed inland, so that the Phoenix Company got the order, although their price was highest. It is interesting to note that the changing of the material from iron to steel only involved an increase of 5 per cent, the tests being as above, and it is further noteworthy that the Phoenix Company wished the truss to be 35 feet deep, and offered to make the price less with it than with a 32 foot truss.

The point suggests itself: How could the American firms offer to build the bridge in as few weeks as the English firm required months? The reply is simply that their system of bridge building enabled it to be



OUTSIDE VIEW WITHOUT MUFFLER. INSIDE VIEW WITH MUFFLER. THE KINNEY LOCOMOTIVE VALVE.

AMERICAN IMPROVED LOCOMOTIVE VALVE.

The accompanying cuts show two forms of locomotive valves, one with muffler and one without muffler, which were designed and patented by A. P. Kinney, superintendent of the American Steam Gauge Co., of Boston. The superiority of this locomotive valve lies in the fact that it can be adjusted on top without removal from the dome of the locomotive. In order to adjust either the pressure or the blowdown, first remove the muffler, I; this exposes the compression screw, G, adjustable nut, M, crosshead, L, locking latch, O, and check nut, H. By loosening the check nut, H, and screwing down the compression screw, G, the pressure is increased, and the reverse for lessening the pressure. As a general rule, from 1-6 to 1/4 turn will change the pressure of the valve five pounds either way. By raising the locking latch, O, and screwing down on the adjusting nut, M, one notch, you reduce the blowdown one pound, and the reverse increases it one pound.

Until the present styles of locomotive valves were placed on the market by this company, in order to adjust the blowdown, the valve had to be taken from the dome of the locomotive. It was also impossible to adjust while steam was on. The present styles do away with these objections and are a great advance over anything hitherto produced.

Although lately placed on the market, a number are in use on the largest railroads of the country. These are giving excellent satisfaction, and additional orders from the companies using them are the best evidence that a trial is all that is needed to secure their adoption.

The American Steam Gauge Company, 34 Chardon Street, Boston, who are the sole manufacturers, will be pleased to furnish additional information to any one making application.

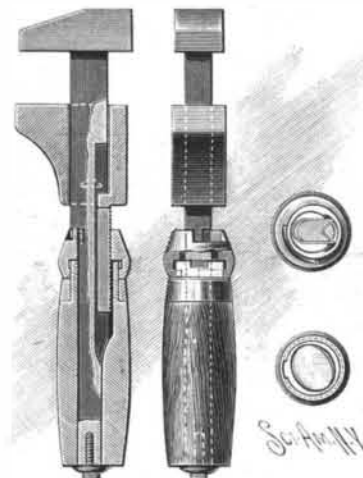
A LOCOMOTIVE STONE BREAKER.

With the improved means of stone ballasting a railway track shown in the illustration, nothing but clean stone, substantially free from dust, and with no admixture of soil, is placed upon the roadbed. The improvement forms the subject of two patents issued to Mr. A. B. Austin, of Fort Wayne, Ind., the machine being in the form of a locomotive adapted to run thirty miles an hour, while it can be changed to a stone breaker in five seconds, by raising the drivers off the track. The machine is always ready for use, on the road or in the quarry, and will break from twenty-five to thirty cubic yards of stone per hour, while it will also haul one loaded car. The rock for ballasting can be handled in large lumps, being loaded on flat cars and drawn to the place of use, two-thirds of the rock being undisturbed as it is dropped from the car on to the roadbed, thus saving the handling of the ballast by shovels. The distance between the crushing jaws and the size of the crushed material is regulated by raising or lowering wedges by means of a rod and nut. The material is crushed by the machine to a more uniform size and in a more expeditious manner than the same can be effected by hand for a macadam or an or-

dinary roadway, as well as for a railroad, and is delivered with great facility at any desired point, its means of self-propulsion enabling it to be moved at a minimum of cost, and saving expense of handling.

AN IMPROVED WRENCH.

In this simple and durable wrench, which has been patented by Mr. William H. Kaltenbeck, the lower jaw may be made to slide up or down upon the shank of the body bar, and be locked at any desired position thereon, by means of an easily manipulated lock nut or sleeve. The small figures show different sections of the locking nut or sleeve, a cross section of the body bar for a portion of its length, as shown in one of these figures, having its forward edge cylindrical and threaded, while in its rear edge is a V-shaped groove, in which fits an arm or socket extension integral with the lower or movable jaw of the wrench, the exterior surface of the extension being cylindrical and provided with a



KALTENBECK'S WRENCH.

thread. The locking nut or sleeve is swiveled upon the upper end of the handle, from which it is readily detachable, and this nut is made in two diameters, one greater than the other; at the lower diameter the inner contour is circular and at the upper diameter it is somewhat elliptical, the opposite side walls of the smaller diameter of the nut having threads. To adjust the lower jaw to or from the upper one, a turn of the sleeve or nut permits the lower jaw to be moved freely upon the body bar, and when the jaw has been properly placed the sleeve is turned in the opposite direction, when its threads engage the threaded surfaces of the body bar and the socket extension of the movable jaw, firmly locking the latter in the desired position. The jaws of the wrench may be shaped for use either as a monkey wrench or as a pipe wrench.

Further information relative to this improvement may be obtained of Mr. W. F. Baker, Middlesborough, Ky.

Electricity is our authority that an electric railroad from Main Street, Orange, N. J., to Montclair, with a branch running from West Orange to Eagle Rock, is to be built as soon as the weather will permit the work to be done. The terminus at Montclair will be at the Delaware, Lackawanna and Western Railroad station.

done. Here the builder gets his drawings from the railway engineer, who designs every rivet and bolt, if he does not specify how the rivet or bolt is to be driven. A. B. wishes one style, C. D. an entirely different type, so that the builder must be prepared for anything—the advocates of the American system might say for nothing. In America, on the other hand, the builder designs the bridge, or rather he has a standard type, and the engineer only needs to state requirements. The firm can therefore have special machinery for rolling their iron or steel to the standard sections needed, and are thus independent of steel makers. They are, therefore, prepared in the fullest sense of the word. It may be urged that the British system admits of greater choice of design, and therefore suits British needs; but after all it is to the foreigner we, in large measure, have to look for orders, and as a rule he is satisfied with what he can get quickly and cheaply, provided it meets the desired conditions as to load and tension and compression tests. We do not enter into the relative value of American and English designs, or as to whether American or British prices are lowest. Our contention is that there are most convincing evidences that the American practice has its advantages. As to relative prices, it is to be regretted that in the case of the 246 foot span quotations were not got from English as well as American firms; but Messrs. Clark's business was not to collect proofs on economic points. Fortunately, however, the idea suggested itself, presumably for other reasons, to get an English firm to quote a price for a 197 foot span from sketch drawings supplied by an American firm who had tendered, so that we have in this case comparative prices:

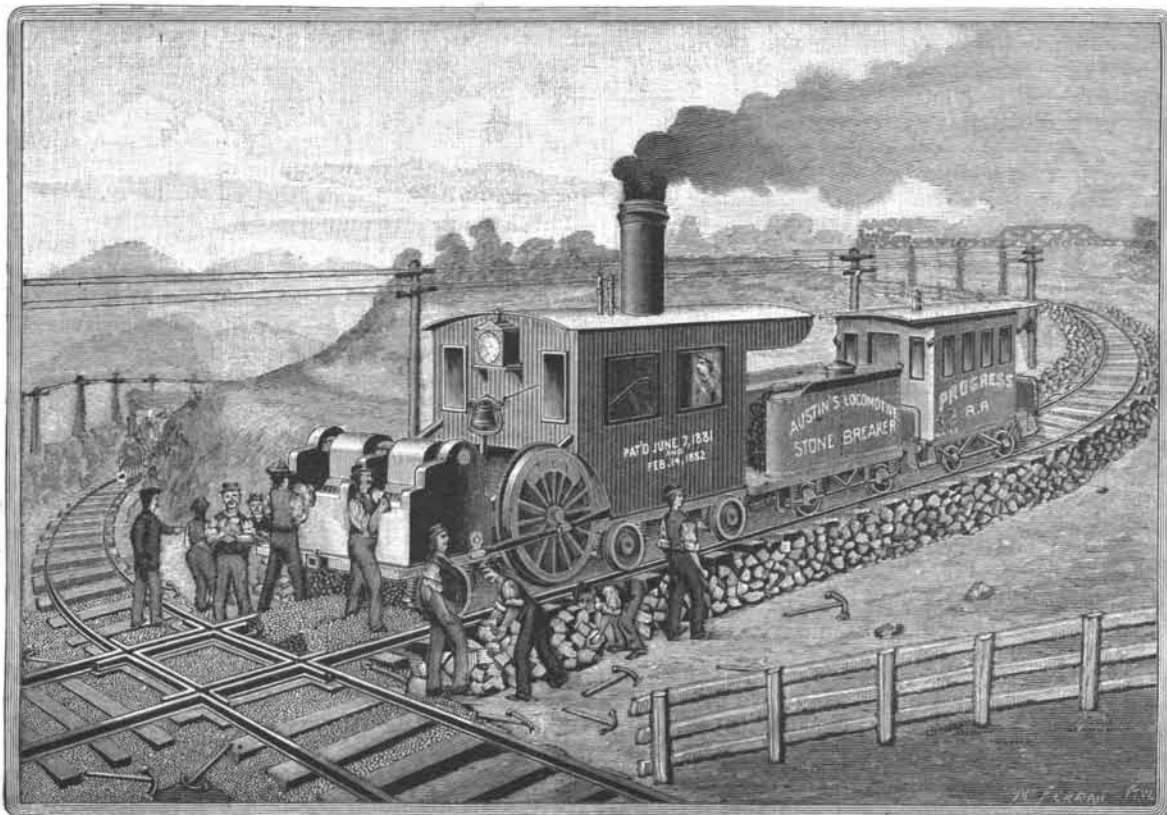
Quotations for 197 Foot Span.

	Price.		Weight.	Price per	
	£	s. d.		Tons	£
Pencoyd Bridge Company,					
America	1,679	13 0	117 1/4	14	5 0
British firm	2,025	3 0	138	14	13 6

It will be noticed that the British firm (which need not be named) assumed a greater weight—that is in accordance with practice—and that their price per ton was greater, notwithstanding that material and wages are said to be dearer in the States. Of course the American firm have special machinery. This, however, one may find in almost all concerns.

We are indebted to *Engineering*, London, for our engraving and the above particulars.

A SLIGHT earthquake shock was experienced in the northern part of New York City and Long Island City, N. Y., on March 8, at 12:40 A. M. The shock lasted thirty-two seconds, and was accompanied by rumbling noises, oscillations from east to west.



AUSTIN'S LOCOMOTIVE BALLAST CRUSHING MACHINE.