drum is a piece of the exact shape and size of the inside of the enlargement or collar of the pipe. This mold, when the pressure is first applied, is brought into action under extreme pressure, and a pair of collar dies are brought around it. The annular space between these dies and the core is closed beneath so that when the clay is forced, it cannot descend, but is obliged to fill the annular space first mentioned. When this has taken place, the collar dies are opened and the pressure continued, the result being then the formation of a pipe of uniform dimensions which slides gradually down over the drum, as shown in the illustration. If, however, the pipe is intended to be curved instead of straight, the guide drums below is not used, but as soon as the collar is formed, the attendant workmen grasp the pipe as it comes out, and bend it to the desired curve by hand. As soon as each section of pipe is thus finished, it is removed and placed upon a rack until thoroughly dry. Where odd shapes, as traps, and the like, are to be made, no press is used, but the plastic material is first hammered into compact condition by hand, and then packed into molds, as shown on the right of our engraving.

Previous to baking in the kiln, the practice of many makers is to dip the pipe into a glazing mixture consisting of a thick fluid mixture of what is known to the trade as slip-glaze, with water. Where soft glazing is used, the material is thrown into the kiln at the proper heat. On the subject of glazing, the views of manufacturers are very diverse, and much controversy has arisen respecting the relative merits of the several methods in vogue. Generally speaking, the Western manufacturers use the slip glaze, while those of the Eastern States prefer the 'slip' glass. The material used for the slip glass is a species of clay, obtained from a locality near Albany, N.Y., and in appearance resembling ordinary potter's clay. It contains an appreciable quantity of carbonate of lime and alkalies, in the presence of which its efficiency in glazing must be ascribed, since at the high heat of the kiln there will be produced, by the action of these alkaline constituents, a decomposition, resulting in the formation of a vitreous double silicate of the lime and alkalies with the alumina of the clay.

The manufacturers of slip-glazed wares claim that the slip glazing is denser and has far better resisting qualities to nudes, alkalies and other destructive agents, than the glazing produced by the use of salt; while, on the other hand, the makers of salt-glazed wares strenuously defend the quality of their products. As it is part of our purpose to settle these rival claims to excellence, we pass the matter by with the simple mention, and return to our inscriptions.

A glance at the proper right hand portion of our engraving shows the method generally adopted for dipping large pipes into the glazing mixture. The pipe rests on a counter-weight suspended platform, on which it is slowly lowered or raised by hand into or out of the mixture. Baking is done in the ordinary way in kilns. No saggers are used, and the pipes are disposed in seats—that is, inside of a 12-inch pipe that is 12 inches in diameter, and inside of that again a 12-inch pipe. The heat is usually kept up for from fifty-four to fifty-six hours, when the glazing has set, having turned to a dark-brownish, glossy hue, the work is done.

Cooper's Mechanical Movement.

The following car, representable, which will doubtless prove interesting to our mechanical readers, has been somewhat delayed in publication, for the reason that we wished to give Mr. Cooper, whose invention is the subject of criticism, the opportunity of presenting his reply to the points raised by M. E., in the same issue.

Edwin M. B. R.

Your favor receiv'd with the fullest confidence but I am now in a position to forward you a few sketches showing some of the many ways this movement is applied in locomotive building. As shown in Fig. 1, it is applied for driving the pattern-chain cylinders for harness and shuttle-box mechanism. Fig. 2 is a sectional view of the same. Figs. 3 and 4 show how it is applied in the same way as boiler gearing, mostly for driving the pattern-chain cylinders for harness. Fig. 7 is an inside view of pin-wheel G. As shown in Fig. 8, it is applied for shuttle-box mechanism. Fig. 9 is a sectional view of the same. United States patent No. 129,640, of July 16th, 1872, will show you another way of constructing it for the same purpose. The above mentioned is mostly applied on Crompton looms when purchasers do not order it otherwise. As in Figs. 1 and 8, it is found on woolen as well as on cotton looms (Crompton's), as in Figs. 8 and 9, and patent No. 129,640, only on cotton looms (Crompton's). I have seen it on other looms; so far as I remember, on Thomas's and Kimble's, but not as frequently.

In looking over some old papers, I find the same movement applied by Mr. B. Eccles in shuttle-box mechanism, in 1850 (see U. S. patent No. 7,127, 1850). The pin-wheel he uses has two or more pins instead of one, as used at present. If I would take the trouble to look over old English mechanical works, I am sure I can be found applied for a great many other purposes, but my time will not permit.

As you fail to see that the movement, so far as there is a movement in the "Ganwa stop," is the same in character as Mr. Cooper's, I have drawn out one as I find it in "American's Cyclopaedia of Applied Mechanics." (see Fig. 10 of my sketches). Please examine and compare the movement of J, say for two or three teeth in B, or two or three revolutions of A, with the other movements, as shown in the sketch, and Mr. Cooper's, as shown in the Mackenzie and Bunyan, and obliges in informing me in what shall find the difference. I know it is designed, constructed and applied for a different purpose; but that does not change the character of the movement as a movement. Let us compare the movement of any two or three teeth in Fig. 10 with the other movements as applied on looms, and Mr. Cooper's as shown in your