AGRICULTURAL INVENTIONS.

Mr. John P. Smith, of Claverack, N. Y., has patented an improvement in thrashing machines for which letters patent No. 53,694 were issued to him April 3, 1866. The improvement consists in so combining a perforated apron and concaves with the rotary cylinder of a thrasher as to create an upward blast through the apron to lift and assist in carrying the straw to the cylinder.

An improvement in cotton scrapers, choppers, and dirters has been patented by Messrs. Samuel A. De Force and William V. McConnell, of Crockett, Texas. The object of this invention is to furnish an improved machine for cultivating cotton which shall be so constructed as to bar off, scrape, chop, and dirt the cotton upon both sides of a row at one passage.

Mr. William R. Iles, of Fairmount, Ill., has invented an improved check-row planter, of that general form in which a cord or chain is provided at regular intervals with lugs, tappets, or knots, which cord is staked upon opposite sides of the field, and which knots or tappets, as the machine is drawn across the field, successively operate the dropping devices to cause the corn to be dropped in perfect check row. The improvements consist in the novel construction of the device upon which the cord or chain acts to impart the motion to the seed slides, and in the peculiar construction of guides from which the rope or chain passes out to the front and rear of the machine.

NEW SYSTEM OF DIGGING AND CURBING WELLS.

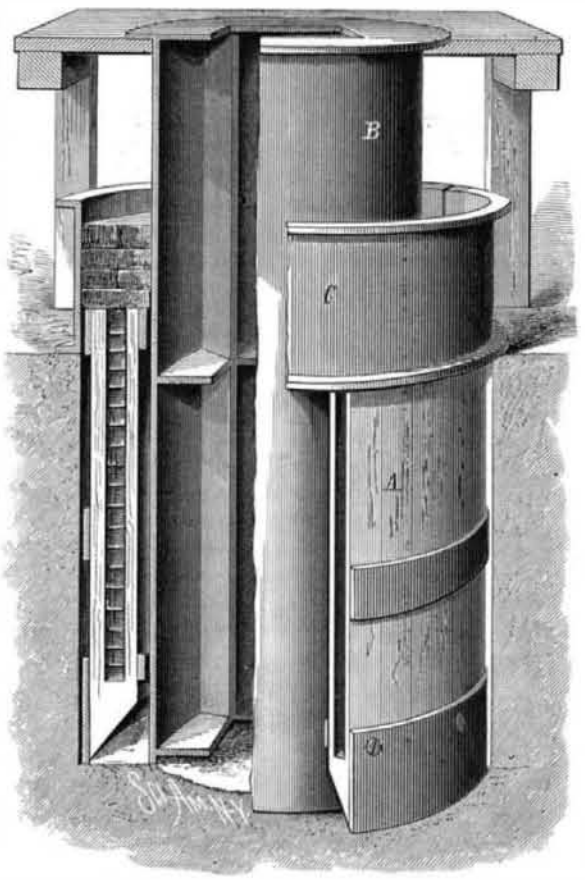
The annexed engraving represents a novel method and apparatus for digging and curbing wells, recently patented by Mr. Christopher C. Hackett, of Floyd, West Carroll Parish, La. The invention is intended to secure accuracy in the shape of the well and in the direction of digging; it permits of proceeding simultaneously with the two operations of digging and curbing, and it prevents the caving in of the well. In the engraving, which is partly broken away to show the internal construction, the sand box, A, which is shown as just entering the shaft, forms the foundation of the wall, and follows the shaft as it is dug by the workman. This box is made of wood, and is hollow from the top nearly to the bottom. Below the hollow portion the staves are chamfered off from the inside to give a narrow bearing edge. The staves are held together by iron hoops upon the outside, and wooden hoops on the inside, and the annular chamber formed between the staves is filled with masonry. A platform is erected over the well shaft at the proper height to enable the workman to lay the well curb or wall underneath.

An inside guide, B, consists of segments forming a cylinder, of a diameter just sufficient to allow it to fit inside the sand box. The wall is supported by an outside guide, C, a little larger than the sand box, which rests on the earth at the edges of the mouth of the shaft. For the sake of convenience in placing and removing, it is divided diametrically.

The invention is applied by sinking the sand box, A, into the shaft its full depth, then the platform is erected over it, and the sectional inside guide, B, is passed down in the sand box. The workman then proceeds with the digging, and as he deepens the shaft the sand box sinks, and the wall or curb is built on top of the sand box between the walls of the inside guide, B, and those of the outside guide, C.

The thickness of the curbing or wall equals the thickness of the walls of the sand box, and the inside and outside guides supply a sure guide for building it. As the shaft deepens, the sand box, and with it the finished curb built upon it, sinks.

In this way the digging and curbing are carried on at the same time. The chamfered lower part of the sand box permits the workman to reach with his tools to the edge of the box, so that he can dig evenly all around and underneath it, and thus let it descend evenly. Above the platform an ordinary derrick is erected, with a windlass, pulleys, etc., for lowering the sections of the inside guide, and hauling up the detritus. If, after the well is dug, the water should fall below the top of the sand box, and thereby expose it to decay, the brick filling or masonry contained in it will remain as the foundation of the well or curbing, and thus prevent it from caving in.



HACKETT'S IMPROVEMENT IN DIGGING AND CURBING WELLS.

The inventor informs us that wells made on this plan are free from surface water, and are shut out from contamination by the infiltration of sewage, as the walls may be made perfectly tight by the use of cement, and no water can enter that does not come from the fountain head. This is a very essential feature where wells are still in use in the larger towns and cities, and it is not less so in the country, where now, in a large proportion of cases, foul water from the cattle yards finds its way into the wells.

LIGHT LOCOMOTIVES.

Persons who are familiar only with the ponderous locomotives that are used on the great through freight and passenger lines would hardly recognize their kinship to the many varieties of light locomotives that are used for all kinds of special service. We present illustrations and descriptions of a few of these light locomotives, built by H. K. Porter & Co., of Pittsburg, Pa., whose shop, we are informed, is the only one in this country exclusively occupied by this kind of work.

MINE LOCOMOTIVES.

The adaptation of the light locomotive to use inside of mines involves modifications which change its outward appearance without specially affecting the working machinery. The smoke stack is shortened, the roomy wooden cab is replaced by a low iron canopy, the steam dome is reduced in height, and a special throttle valve used to secure dry steam; and the sand boxes and whistle are placed out of the way. Some of these mine locomotives never see the light of day; they are sometimes little more than four feet in height, so that a man can easily look down the smoke pipe while standing alongside of the track, and if he has tolerably long legs he can ride the locomotive sitting astride the water tank. In spite of their diminutive size these little turtle-shaped machines are very powerful. One engine does the work of ten to thirty or more mules, at about the daily expense of operating two to four mules, while the cost of the engine is usually rather less than that of the animals it replaces. Its life is longer, and it consumes nothing while standing still during any suspension of mining, for it only needs a few cents' worth of white lead and tallow to keep it in good condition while standing in its stall; mules, on the other hand, do not have diminished appetites when not at work. Another important advantage of the locomotive over animal power is its ability to haul extra heavy loads and make more frequent trips whenever an increased output is desired, and this is done without any additional investment beyond a trifle more coal and water used. To increase the output by animal power involves an increase in their number, for flesh and blood have not the capacity possessed by iron and steam to endure overwork.

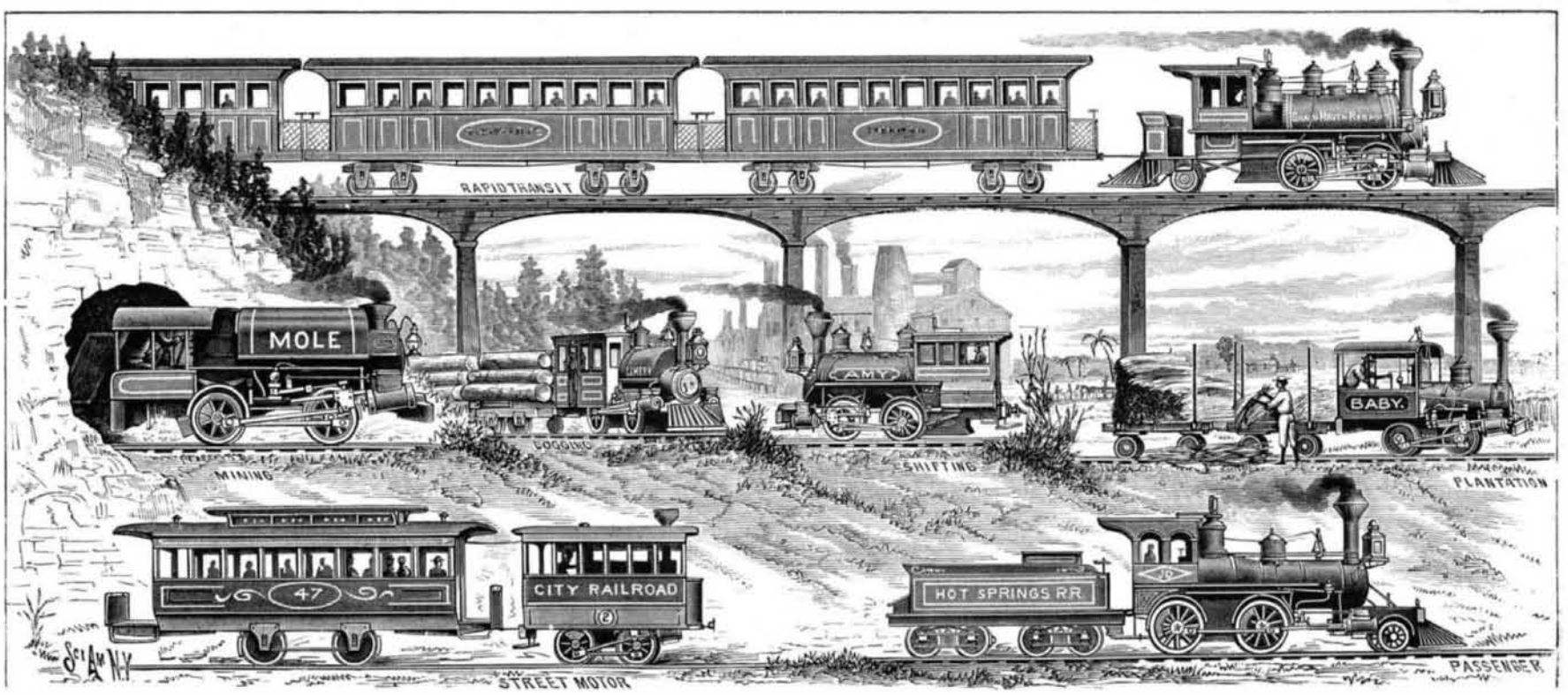
Mine locomotives are not only valuable in coal mining, but are also well suited to the mining of precious metals, where they effect such a saving as to bring into the market great quantities of low grade ores which are not rich enough to pay for hauling by animals.

The economy of locomotive over animal power applies of course to all kinds of surface tramways as well as to underground hauling.

LOGGING LOCOMOTIVES.

The quantity of lumber used annually in the United States is enormous, and one large item in the cost is the expense of hauling the logs to where they may be floated or carried by rail to the mills. This is now done to a great extent by light locomotives on cheaply built railroads. In the northern districts logs are also hauled on sleds over the snow. This is impracticable for long distances and is expensive in all cases, and is liable to interruption in mild or open winters, in which case the logs left in the woods till the next season are often destroyed by boring worms, fire, and decay. The locomotive is independent of the season of the year, and is capable of hauling immense quantities of logs and to run twenty-four hours a day when the price of lumber makes this desirable. The hauling is done so cheaply that "culled" or poorer grades of logs, which would otherwise be left to rot in the woods, can be profitably marketed, and a logging operator can make a handsome profit when selling at what are cost prices to others who haul by animal power. The size and style of the locomotive, and the weight of the rail used depend on the amount of business and the length of the haul. The whole outlay for a steam logging railroad is about fifty cents to one dollar for each thousand feet of lumber readily reached by it, or considerably less for large tracts. When the tract is all cut off, the railroad may be shifted to another tract at slight expense.

One of the most important logging railroads in Michigan is some thirteen miles long and uses four locomotives, each of eight tons weight. Several square miles are annually cut off to furnish it with freight, which runs up to about a half million tons each year. Like many of these roads it has no railroad connection, and the only communication



LIGHT LOCOMOTIVES BUILT BY H. K. PORTER & CO., PITTSBURG, PA.