

IMPROVED BAND SAW.

Until within a few years, the manufacture of band and scroll sawing machines was carried on as a side matter, or a "filling in," by large concerns making every variety of wood cutting machines. In consequence of this no particular attention was paid to improving and simplifying designs or systematizing their manufacture. Orders were taken for them to complete an outfit, and they were made a few at a time, according to the number of orders on the book. Goods made this way cost a great deal more money, proportionately, than a regular line of work, and the purchaser had to stand it.

The machine shown in the engraving has been made a specialty, and modern conveniences are applied in the manufacture by which they are fitted up. Costly special tools have been constructed, competent workmen are employed, and in this way a good article is produced at a much lower price than by the old method.

By recent improvements this well-known tool has been rendered very efficient and durable. A new blade straining device has been introduced, whereby a balance lever is made to show on an index plate the amount of tension necessary for any size of blade. The index plate is immediately in front of the operator, and there is always an elastic strain on the blade, no matter what its size, thus avoiding a serious difficulty in counter-weighted machines, by which light blades are strained rigidly when the weight is set for a wide blade and carelessly left there by the operator, as often happens.

The wheels are iron, and have improved concave arms and T rim, by which they are made light and strong, and they are covered with canvas-strengthened pure rubber bands, securely cemented, and ground perfectly true. The shafts are of steel; the lower one has bearings 6 inches long, the upper one having a single bearing 12 inches long. The latter is adjustable, so as to shift the blade on the wheels. The loose pulley is self-oiling, and its hub is 7 inches long. The frame is hollow and cast in one piece, according to the best modern practice, and is finely designed and proportioned for strength. The machine is provided with steel self-oiling guides both above and below the table, having all necessary adjustments, and so arranged that wood may be used for side guides if preferred.

This machine is adapted to general work of all kinds, such as is found in agricultural, cabinet, car, chair, carpenter, millwright, pattern, wagon, and job shops, in both hard and soft wood. It can be arranged for resawing or splitting lumber up to 10 or 12 inches wide successfully.

This machine is manufactured by Mr. F. H. Clement, 123 Mill St., Rochester, N. Y.

One Blast of 130,000 Tons of Rock.

A notable blast was discharged January 11 at the limestone quarry of the Glendon Iron Company, Easton, Pa., displacing, it was estimated, 130,000 tons of rock. The blast was made in a hill 150 feet high and very steep. Three tunnels, about 100 feet apart, were run into the hill northward, and two smaller tunnels ran to the east and west. In the six chambers at the ends of the tunnels were placed 29,000 pounds of Judson powder, having, it was estimated, the rending force of 36,500 pounds of common powder. The blast was fired by electricity. It was the heaviest ever made in that part of the country, and one of the heaviest recorded.

IMPROVED COTTON CHOPPER.

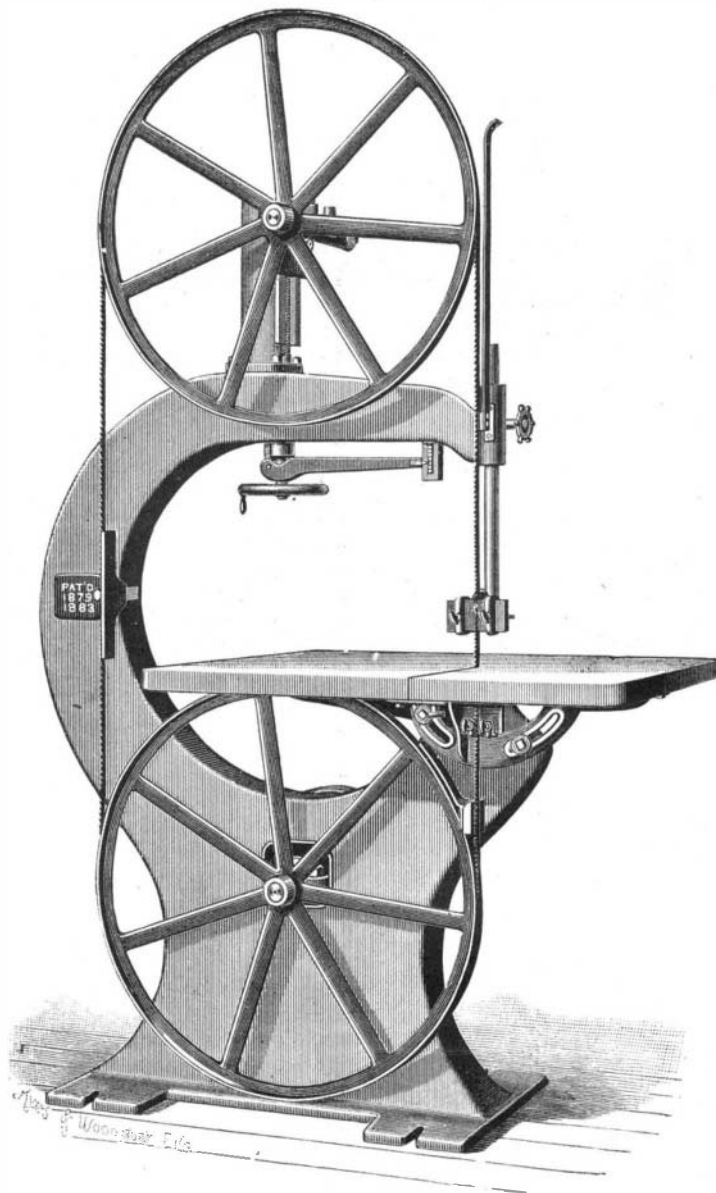
The engraving represents an improved cotton chopper, consisting principally of a slotted bell-shaped cutter, adapted to be attached to any plow, and to receive rotary reciprocating motion from a drive wheel attached to the plow beam. The cutter has an adjustable knife for closing the slot in the cutter more or less, so that the slot will leave a greater or less number of plants in the stand.

The plow to which the chopper is attached may be of any approved construction. The cutter is, by preference, made bell-shaped, and is formed with a vertical slot, and provided with an adjustable knife, placed inside of the cutter. The cutter is attached to the plow by means of the bearings at the rear end of the plow beam, in which the upper end of the shaft of the cutter is journaled. The lower end of the shaft is journaled in an arm extending back from the land side of the plow.

The chopper receives a reciprocating rotary motion

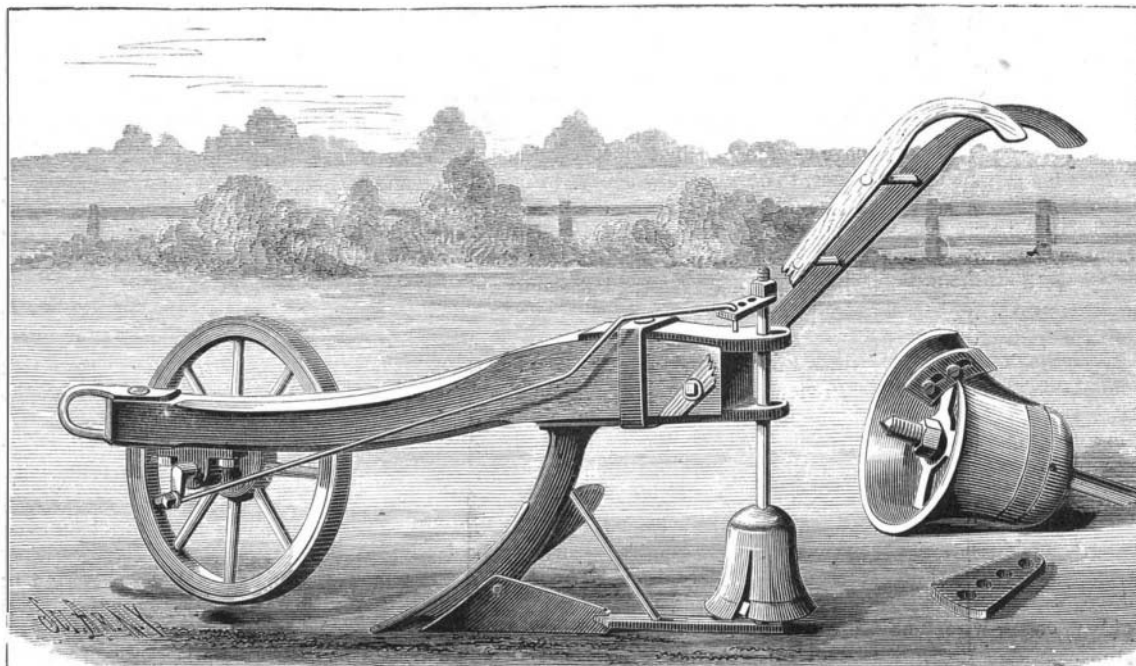
from the crank shaft of a wheel journaled near the forward end of the plow beam. The shaft of the cutter is held in line with the land side of the plow, so that one-half of the diameter of the cutter will reach outside of the plow to the left, and will reach over the row of plants being chopped out.

In use, the rows or drills of cotton are first furrowed off along one side by the plow, or a plow without the cutter attached. The cutter is then attached to the plow, and the plow is run along the other or unfurrowed side of the rows. The cutter, reaching over the row, will cut out all of the

**CLEMENT'S BAND SAW.**

plants in the row until the slot is brought, by the rotary reciprocating movement which the cutter receives from the drive wheel, in line with the row of plants. When in this position the cutter will skip the plants in the row until it is turned back so that the slot is no longer in line with the row, when the cutter will again cut all of the plants in the row. The cutter, having a regular rotary reciprocating motion, the plants will be skipped regularly, making hills at uniform intervals along the row provided with standing plants opposite the slot in the cutter.

The distance between the hills may be increased or diminished, as desired, by changing the connecting rod in a series of holes made in the crank. This invention has been patented by Mr. Martin S. Michaelis, of Benton, La.

**MICHAELIS' COTTON CHOPPER.****The Pioneers of American Railroad.**

Mr. John Raymond, of Scranton, Pa., died in that city, December 22, 1882, at the advanced age of eighty-seven years.

Mr. Raymond built the first mile of railroad in America for the commercial use of steam locomotives. The track was on the Delaware and Hudson Canal Company's road, between Honesdale and Carbondale, Pa. The first locomotive used was the "Stourbridge Lion," built in England. The engineer was Horatio Allen, now living at East Orange, at the advanced age of nearly ninety years.

The first run of the locomotive on the Honesdale road was made August 28, 1829; but this was not the first trial of the engine in this country. The engine was put together at the West Point Foundry, foot of Beach Street in this city, and was there tested August 8, 1829, on a trial track about 2½ miles in length. This run was also made with Mr. Allen as engineer.

Mining Experts.

A writer in the *Mining Review* concludes that no class of men have been so poorly appreciated by both miners and investors in mining property as the mining expert, but he predicts that the day is at hand when conscientious men, who have carefully studied the sciences of geology and mineralogy, and by practical and extended experience become familiar with rocks and minerals, will be in active demand to determine the investment of capital in new mining districts.

The best business men at the present time, and most successful in their mining investments, keep in their employ a trusted man, and all purchases of mining property are made upon his favorable report.

The extent of mineral bearing fields and the great variety of formations and ores make it impossible for the "tender-foot" or even the experienced miner to master the geological and mineralogical laws as one who has spent a life-time in the broad and thorough investigation of these things, with every available appliance of the past and present; and thoroughly qualified men will now be recognized as they never have been before.

In every other science we avail ourselves of the knowledge and experience of those who have made themselves familiar with its highest development, and recognize the worth of men of ability and high achievement. Mining is rapidly rising up out of the domain of chance and speculation, and is taking its true position as a business, based upon a substantial foundation, and governed by laws of a science as deep and grand as any which the wisest philosophers have ever investigated, reaching back to the beginning when the earth was void and without form, and its elements were tossing in the tumult of chaos. The opening of a new season will make a demand for thoroughly well qualified and reliable men; let such men be prepared, not only to faithfully perform their duty, but to vindicate the honor and value of their profession.

Effects of Diet on Liability to Infection.

Professor Feser, of Munich, has been making experiments on animals with a view to establishing the connection which exists between diet and liability to infection. In the trials he has made on rats inoculated with the poison of cattle distemper, he demonstrated the fact, says the *Lancet*, that the animals which had been fed on vegetable diet were quickly attacked by the disease, while those which had been fed exclusively on meat resisted the effects of the inoculation.

In recording this fact, a leading journal, in connection with the Continental leather trade, attributes to the greater amount of vegetable diet, in the shape of bread, beer, etc., taken by woolsorters between Saturday and Monday, the greater frequency of cases of outbreak and the aggravation of disease during that period.

Krupp's works, at Essen, now employ some 439 steam boilers; 456 steam engines, with an aggregate horse power of 18,500; 89 steam hammers, varying in weight from 200 pounds to 50 tons; 21 rolling mills; machines for making tools, 1,622; furnaces, 1,556, of which 14 are high furnaces; 25 locomotives; and 5 propellers, with a tonnage of about 8,000. Annual production, 300,000 tons steel and 26,000 tons iron.