

AGRICULTURAL INVENTIONS.

A novel combination, with the seed dropping slide of a corn planter, of a pair of rimless wheels, a shaft, a series of elastic arms, and a cam, whereby provision is made for dropping the corn at regular intervals, has been patented by Messrs. Nimrod J. Curtis and W. J. T. Curtis, of Martelle, Iowa.

An improved combined harrow, seeder, and roller has been patented by Messrs. Robert Lang and James B. Lang, of Lindsay, Ontario, Canada. The object of this invention is to till or mellow the soil, sow the seed, and smooth or roll the land at one operation.

Mr. John C. Waddell, of Union City, Tenn., has patented a broadcast seed sower for sowing clover seed and other fine seeds, so constructed as to sow the seed in uniform quantities; and so stop the escape of seed automatically when the mechanism comes to a state of rest, and which can be readily adjusted for sowing any desired quantity of seed per acre, and finer or coarser seeds, as may be desired.

A New Exhilarating Substance.

Dr. Luton, of Rheims, calls attention in a French medical paper to the exhilarating properties of the tincture of ergot of rye when associated with phosphate of soda. The circumstances of the discovery were as follow: A woman of 62, at the infirmary of the *Maison de Retraite*, in Rheims, was receiving tincture of ergot of rye for disease in the knee. Fearing an unfavorable turn, the doctor thought to strengthen the action of that medicament with phosphate of soda, and accordingly combined a little of the two substances in a quarter of a glass of sweetened water. The patient, about three-quarters of an hour after taking this, surprised the inmates by bursting into loud laughter, without obvious reason, and this continued for more than an hour, with brief intervals. The laughter seemed to be associated with merry ideas, and to indicate a kind of intoxication. For some time after it died down the woman was in great spirits and good humor. Dr. Luton had not witnessed the scene, but the consequences to the patient being good, he administered the substance again, and a third time, observing the same effect. The experiments were further repeated on seven or eight women and girls with like results. In the case of men the action of the substance is less marked; it appears only in coloring of the face, giddiness, and slight headache. The effects in question have probably a common origin, it is thought, with those from eating rye bread when, in rainy years, the cereal contains as much as five per cent of ergot. A sort of intoxication is produced which the consumers by no means despise.

Increased Occupation for Women.

Mrs. Mary A. Livermore says that one evening twenty years ago a few ladies, interested in the welfare of women, discussed the employments open to women. They counted eleven and could think of no more. Recently the same ladies repeated the enumeration, and were able to point out 287 employments which women could engage in.

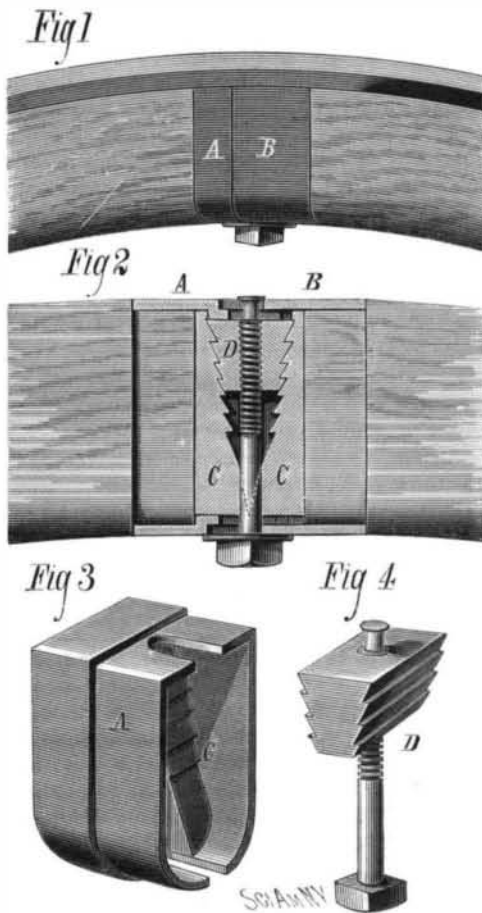
A Gift to the Museum of Natural History.

Mr. Robert L. Stuart, President of the Metropolitan Museum of Natural History in Manhattan Square, has presented to the museum the valuable "De Morgan" collection of prehistoric stone implements from the river gravels and peat beds of Northern France. The series of specimens representing the Stone Age in Denmark at the Centennial Exhibition were already in the possession of the museum; and the gap between that collection and the one just acquired is filled by the magnificent collection deposited by Mr. G. L. Feuardent, which in itself includes a series of objects belonging to the period of the river man in England, the cave man of Southern France, the latter from excavations made by the Marquis de Vibraye, from the tertiary and quaternary habitations of the Lovie Valley. The lacustrine period is fully represented in the Feuardent collection by the finds of Dr. Gross in the Swiss lakes, comprising stone implements with their original handles of stag horn, jade axes, chisels, etc., pottery of all sorts, and finally, numerous tools and ornaments of the bronze age from the same locality. This collection is completed by the ovidian implements from Greece. Prof. Spencer F. Baird, speaking of these two collections, says that no museum on this continent, the Smithsonian included, possesses anything equal to those now brought together at the Museum of Natural History. The museum is also rich in American antiquities.

CARBON tracing paper is prepared by rubbing into a suitable tissue a mixture of 6 parts of lard, 1 part of beeswax, and sufficient fine lamp-black to give it a good color. The mixture should be warm and should not be applied to excess.

NEW TIRE TIGHTENER.

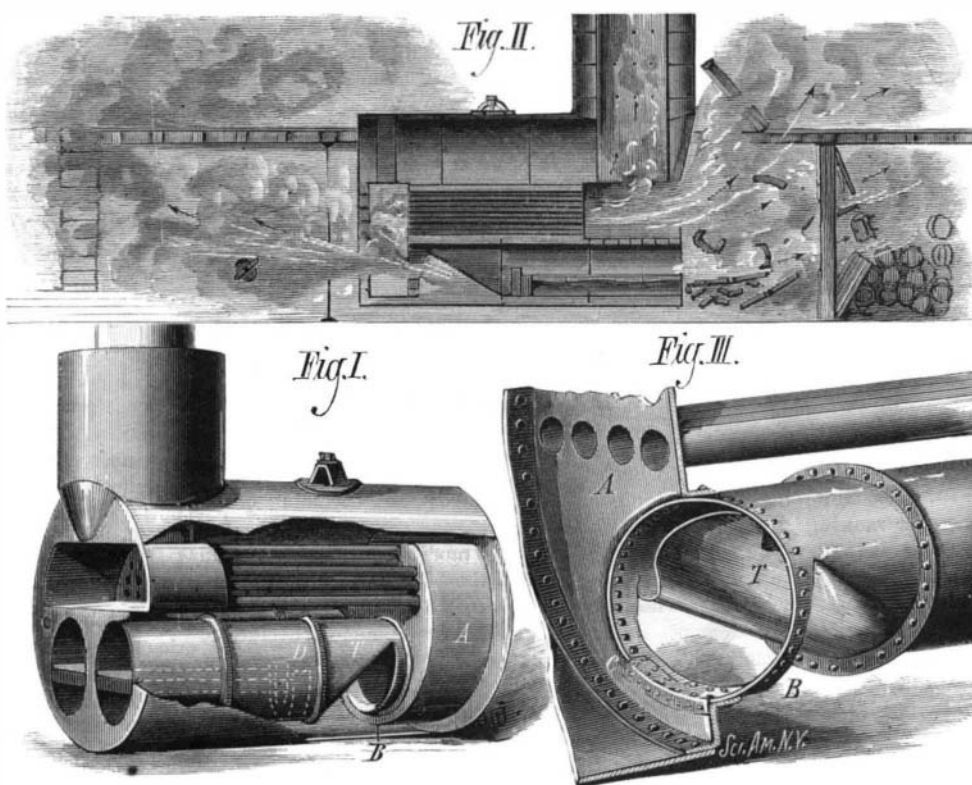
The engraving represents a novel device for expanding the fellys of wagon wheels, so as to tighten the tire and prevent the wheels from being wrecked, as they frequently are when the tire becomes loose.



WILKIN'S TIRE TIGHTENER.

A, B, are telescoping metallic ferrules, provided with recesses, into which the ends of the felly sections are fitted. These ferrules are provided with diagonal toothed faces, C, having between them a wedge-shaped opening, when the ferrules are fitted together. An endless screw carries an elongated nut, D, having diagonal toothed edges, the inclination of which corresponds with the incline of toothed faces, C. The screw is fitted through the ferrules, as shown, so that it has a bearing in the upper plate of ferrule, B, and a projecting head on the inner side of the felly, by which the screw may be turned.

When the wheel is constructed the device is inserted at the joint with the ferrules, telescoping as far as possible, and with the nut at the top of the wedge-shaped opening. When the felly needs tightening the screw, D, is turned, and the nut, E, travels toward the head of the screw and forces the ferrules apart, and with them the felly-sections. As the nut travels along the faces, C C, of the ferrules, the teeth on its edges ride over the teeth on the faces, the teeth interlocking when the nut is stationary, so preventing it from being



EXPLOSION OF THE BOILER OF THE WRECKING STEAMER B. & J. BAKER.

moved back toward the tire by jar or vibration. The expansion of the fellys caused by forcing apart the ferrules tightens the joints of the wheel and expends it so as to tightly fit the tire.

This invention was lately patented by Mr. Alfred Wilkin, of Toledo, O., who may be addressed for further information.

COLLAPSE OF A STEEL BOILER FLUE.

BY S. N. HARTWELL.

On Sunday morning, the 12th of June, 1881, one of the large flues in the boiler of the wrecking steamer B. & J. Baker collapsed while the vessel was lying at anchor off the coast of Virginia. The accident resulted in the death of three men and the scalding of one or two other men. Very little damage was done to property other than to the boiler itself. The vessel was owned and used by the wrecking firm of Baker & Co., of Norfolk, Va., but with other property of that company it is believed to have since changed owners. The vessel is described in the government certificate of inspection, which expires January 22, 1882, as a small passenger steamer, built of wood at Baltimore, in 1864, 212'67 tons register, rebuilt at Norfolk in 1870, having one low pressure (?) engine, 22 x 24 inches, and one iron and steel boiler, built in 1877, 16 feet long by 7 feet diameter, and allowed to carry 50 pounds steam pressure per square inch. There were on this boiler, according to the same authority, the usual safety appliances, namely, two safety valves, three gauge cocks, two steam gauges, and a fusible plug. This vessel is a propeller, and was used for towing and lightering.

It was a tugboat boiler, of the return tubular type, shown in Fig. 2, where the boiler is represented with its port side toward the observer, part of the shell being omitted to show the broken furnace tube. The diameter and length of the boiler are given above. It had two 27 inch round furnace tubes, straight from the boiler front to the back connection, each made of three steel plates about quarter inch thick, which were secured together by outward-turned riveted flanges. A fire-brick bridge wall in each tube at about two-thirds the length from the front, upon which the fire grates abut, divides the tubes into furnaces, ash pit, and flue leading into the back connection, whence the gases return to the up-take chamber and chimney above the furnaces through seventy-five small tubes. Cast iron doors, with door-frames bolted to the front boiler head above the grate level, formed the front walls of the furnaces.

The facts contained in this report were obtained through the politeness of the owner, Mr. J. Baker, who gave the writer permission to examine the interior of the vessel and the broken boiler, which was done before anything involved in the explosion had been moved. Men and means to facilitate the examination were placed at his disposal, in the belief that something would be brought to light in explanation of the accident that came upon them so unexpectedly after having done all in their power to make the vessel safe and efficient.

Fig. 1 is a sectional view of the boiler and fire room. It is intended to explain the course of the escaping contents of the boiler, and the effect on objects in the vicinity. The engraving, by means of the arrows, sufficiently explains the direction taken by the broken objects, which consist of the boiler hatch beam, the bulkhead forward of the boiler, which separated the fire-room from the forward storage room in the hold, the cast iron doors and their frames, all burst off and broken from the front head. The bridge wall and grate bars from the port furnace, and the back connection door from the rear end of the boiler. Hatches and skylights were blown off. The whole interior of the vessel's hold bore marks of the force with which things were driven before the scalding torrent that was impelled by its contained heat with terrible velocity.

Fig. 3 is a sketch on a larger scale showing the rear end of the collapsed tube and a part of the tube head in section. Also the patch upon the lower part of the tube.

The thickness of the plate, T, at the thickest margin of the rupture where a gauge could be applied, was found to be 0.220 of an inch, near the extremity of the torn edge, about half way up the side of the tube. From there to the point, B, the lowest part, the thickness decreased, the metal having wasted by corrosion on the water side, so that after rupture it showed a ragged knife-edge. Near the edge, on the bottom, holes were corroded entirely through. On the lower exterior surface of the other tube were found broad shallow pits of irregular shape extending over a large area, indicating that this tube was thin also, but not as far gone as the port one.

The patch at C, Fig. 3, covering the lower part of the flanged seam, and the rear end of the longitudinal seam of the broken tube, is sufficient proof that the engineer had been warned by a leak that a weakness, or at least a defect, existed here, and it was his duty to have tested with proper tools

the surrounding parts before applying a patch. Drilling his bolt holes in the flue should have shown him that the plate was 1/500 thin, and he should have reported the deterioration that was going on to his owners and the local inspectors. It is obvious that the man in charge of the boilers should watch for and report dangerous defects to the proper officers, otherwise how can they know of their existence and