

IMPROVED AIR BRAKE.

The construction of the brake shown in the annexed engraving is exceedingly simple, all unnecessary complication having been carefully avoided. As a consequence the first cost has been greatly lessened, the weight diminished, and the friction reduced, so that the apparatus may be made smaller than the ordinary form without detracting from its efficiency. The amount of the reduction of the weight amounts to about 140 lb., and the moving parts are reduced to a simple lever and a piston.

The arrangement of the mechanism is clearly shown in the engraving. The air cylinder receives air under pressure from a pipe extending from the engine through the entire length of the train. The forked end of the piston rod is connected with the lever by a pin passing through the fork and through a slot in the lever. The lever is retracted by a spring after being moved by the piston. Opposite ends of the lever are connected with the brakes at opposite ends of the car by the usual brake rods.

This simple mechanism may as readily be operated by a vacuum as by air pressure. The piston is moved more or less, and with greater or less force according as the air pressure is increased or diminished, and the brakes of the entire train are under the control of the engineer.

Further information may be obtained by addressing Messrs. Glenn, Cole & Jaques, Ottumwa, Iowa.

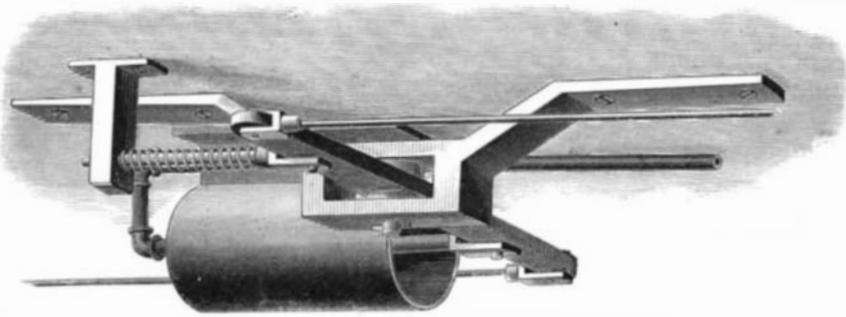
LOCOMOTIVE STEAM CRANE.

We give engravings of a locomotive steam crane designed and constructed by Mr. Thomas Smith, Steam Crane Works, Rodley, near Leeds, which is now working at the Barrow Shipbuilding Co.'s Works, and where it is employed in the erecting and fitting shops, also in the yard for shunting purposes. This pattern of crane was originally designed for Messrs. Pawson Brothers, of Morley, near Leeds, who have had one at work for a period of five months, loading material into ordinary railway trucks, and also for drawing two fully loaded trucks up an incline of 1 in 20, at the rate of four miles per hour, a distance of a quarter of a mile, the distance traveled altogether (and on which there are some sharp curves) from their works on to the main line being about a mile. The crane is fitted with two speeds for propelling (this motion being specially designed to meet the requirements of the case) quick and slow; the quick speed travels at the rate of seven miles per hour with a less weight or on the level road. To obviate the shock to the spur gearing, India rubbersprings are placed over the axle boxes, and the wheel base is such as to allow the crane to travel easily over ordinary curves. The gauge is the usual railway gauge.

The crane has single purchase hoisting motion, fitted with a powerful friction brake and catch, so that when required the crane can be propelled with the load suspended. The revolving motion is worked with a double friction cone, so that the crane can be made to revolve in either direction without stopping or reversing the engine, and to keep the crane from slewing round when on the incline, a small brake is attached on the first motion shaft. All the gearing is of the best crucible cast steel, and the central pillar is of best forged scrap iron.

The engines consist of a pair of cylinders 8 inches in diameter by 10 inches stroke, and are each fitted with link reversing motion, and crank shaft of steel. All the bearings are bushed with phosphor-bronze, and are adjustable. The boiler is of the ordinary vertical type, with three cross tubes through the fire box; the internal parts being of best Yorkshire iron. All the vertical seams are double riveted, and all the rivet holes are drilled in position. The boiler is fitted with the usual mountings, and also with a feed pump and a Giffard's injector. The tank is capable of holding a large supply of water, a great desideratum in a crane of this description, as it avoids the necessity of having to go for a

supply between the ordinary meal hours. The crane is made to lift and propel with a load of five tons at a radius of 16 feet, and will lift heavier weights at a proportionately less radius, the power of the engine and strength of the gearing being such as to allow it to do this. The above mentioned weight can be lifted without fastening the crane down to the rails by means of clips. All the motions are within easy reach and control of one man, and the design

**GLENN'S AIR BRAKE.**

generally is excellent. The total weight of the crane is twenty tons.—*Engineering.*

RECENT INVENTIONS.

Mr. George Egart, of Mooleyville, Ky., has patented a combined apple parer, corer, and slicer, by which the apples are pared as the mechanism is moved in one direction, and cored and sliced as the mechanism is moved in the other direction. The construction is very ingenious.

An improved neck yoke tip, patented by Mr. Charles Schuman, of Rockford, Ill., is both ornamental and useful. It permits the use of brass, or other metal that can be plated, for the ferrule plate or ring, while using iron for

Mr. James Smith, of Thornliebank, county of Renfrew, North Britain, has patented a dye and bleach vat more especially designed for the series of processes known in calico printing as dunging or treatment with dung substitute, but which is also applicable to bleaching and dyeing processes, etc. The apparatus is claimed to be far more convenient and compact than that heretofore used.

Mr. Heinrich Trenk, of Berlin, Germany, has patented a composition for tanning hides and skins. Two solutions are employed, mixed in the proportion of two of the first to one of the second. The first solution is composed of 25 parts pyroligneous acid, 25 parts chromate of alumina, in 1,000 parts of water. The second is a concentrated solution of crude tartar and a small quantity of chloride of zinc or analogous salt.

Mr. John McLeod, of Auckland, New Zealand, has invented a self-adjusting mast which is intended to increase the safety and improve the sailing qualities of boats and vessels. The mast is hung on trunnions on a thwart of a boat or beams of a larger vessel, and its foot rests on a curved tube with strong springs coiled around it. A counterbalance is secured about the foot of the mast to increase the inertia and to operate as self-adjusting ballast, and strong springs are also attached to the shrouds to assist in holding the mast in an upright position.

A pocket register for recording one's daily expenses has been patented by Mr. Frederick Horn, of St. Louis, Mo. Two small disks are marked with numerals on their outer faces, placed back to back and united at their edges for about three-quarters of their circumference. A movable disk that may be held fixed by a spring, has numbers, lines, and indentations on and about its edge, and is inserted on a pivot between the fixed disks. By turning the movable disk the amounts of separate expenditures are added to those previously recorded.

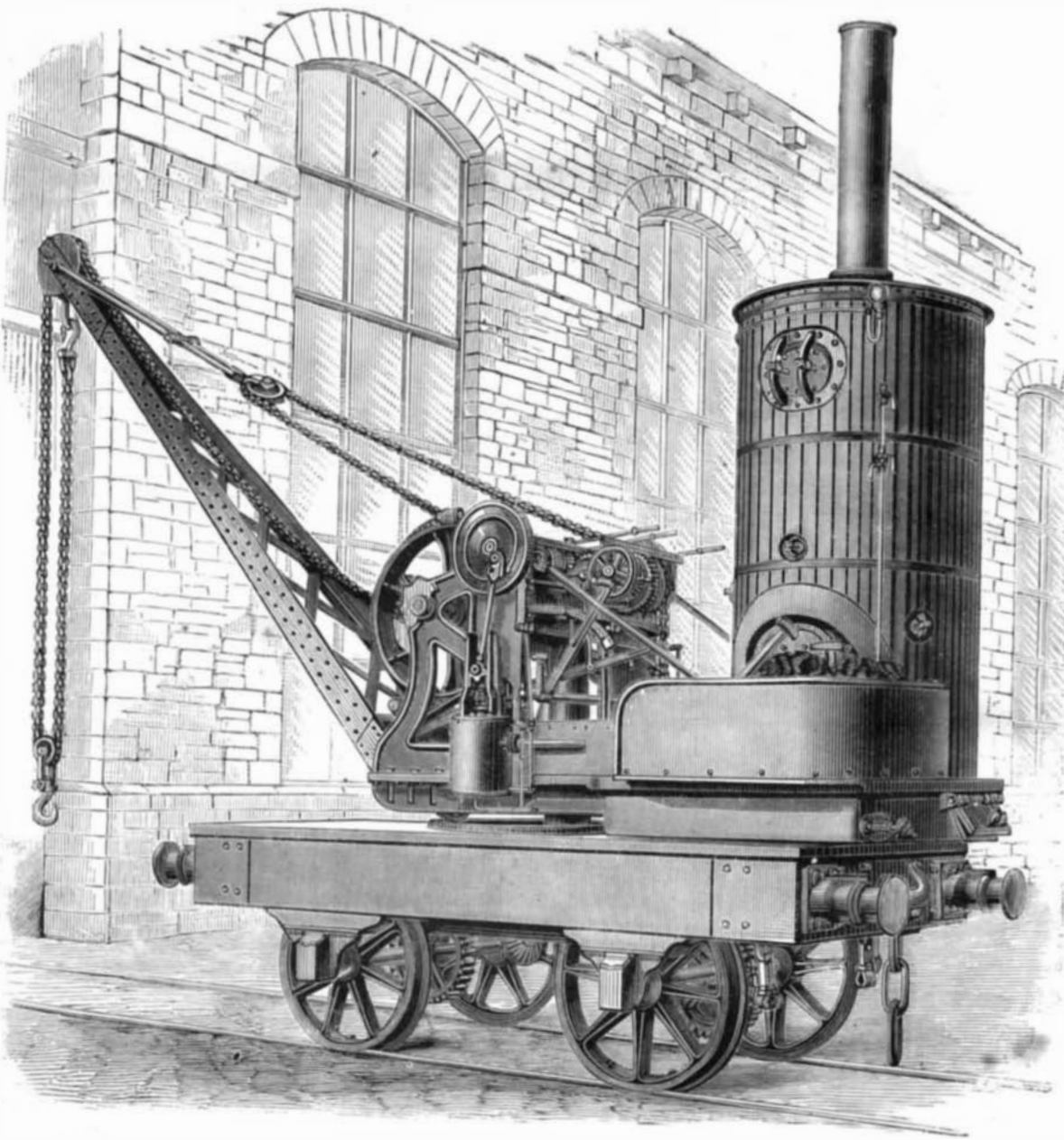
A root cutter, for cutting roots of trees, patented by Mr. Thomas Davies, of Fall River, Mass., may be used for the cutting of roots in felling trees without dulling the cutters, for cutting limbs from fallen trees, for splitting wood, and other purposes.

A water indicator for boilers, patented by Mr. John Bridges, of Leon, Iowa, consists of an arrangement of float pipes, levers, and an indicator, which operate in combination with a water supply tank, feed pump, and boiler for automatically regulating the height of water in the boiler and indicating the water level.

Mr. Louis D. Clairoux, of Detroit, Mich., has patented a fruit gathering apparatus, which consists in a novel construction, arrangement, and combination of a framework, apron, trough, and other devices, which provide for readily applying the apparatus to a tree and adjusting it to different positions. The fruit is received upon the yielding surface of the flexible apron, and, rolling to the center, passes into a trough, which conveys it, without bruising, to the ground.

An apparatus for conveniently retailing nails, nuts, and other articles sold by the pound and which facilitates the handling of such goods in getting them out and weighing them, has been patented by Messrs. Henry C. Draper and Thomas Bowyer, of Oswego, Kansas. The receptacles which hold the articles are hung on trunnions in a novel sort of frame, so that they can be turned down into a horizontal position for the more effective employment of the scoop or other implement used to take them out.

A device for extracting cartridge shells, patented by James F. Marvin, of Fort McDowell, Arizona Territory, provides a means whereby, when the heads are pulled off of cartridges, the shells may be easily extracted. A slotted expanding tube, with flanges and shoulders, and an expanding pin, is inserted into the shell. The closing of the breech expands the device into engagement with the metal of the shell, and when the breech is again opened the whole is extracted together,

**LOCOMOTIVE STEAM CRANE AT THE BARROW SHIPBUILDING COMPANY'S WORKS.**

the loop; and also permits finishing the ferrule or plate in a lathe. The invention consists of a ring with a recess and a loop with a hook at one end, the hook end of the loop being placed in the recess of the ring, both ring and loop being then driven over the end of the neck and secured by a screw or rivet passed through the free end of the loop.

Mr. Seymour Van Nostrand, of Stormville, N. Y., has patented a vehicle spring, claimed to be of superior elasticity and strength, and having the important feature that by ingenious devices the elasticity of the spring can be increased or diminished at will to suit different loads.