

**BOOMER & BOSCHERT BALING PRESSES.**

These presses are of the power-driven elbow joint type. The power is taken from a countershaft by chain belt and sprocket wheels so as to largely multiply the power received. A double set of elbow or toggle joints are the agency for converting the rotary into vertical motion. The general construction is obvious. In some particulars the construction shown deserves special notice. The horizontal screw is of steel, of large size, and is driven from both ends in the heavier presses. The screw nuts are of solid bronze, securing great strength and capability of wearing well. The beams and girts are made of the best rock maple. To secure the top and bottom beams, iron rods  $2\frac{1}{4}$  inches in diameter are employed in the press shown. This insures greater strength and compactness than where wood alone is used to secure the press against the vertical strain.

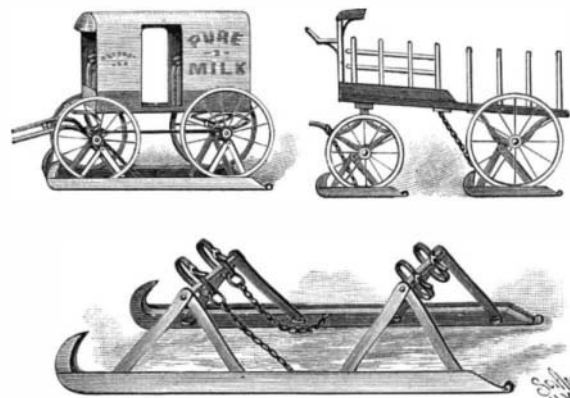
To introduce the material, the top is moved to one side. To render this easy, it is carried on rollers and is rolled to one side upon the rails extending to the rear of the top, as shown in the cut, when the press is to be filled.

Such a press as shown stands 16 feet in height, gives a movement of 5 feet to the follower, and turns out a bale 24 by 30 by 48 inches for smaller sizes, up to 28 by 36 by 60 inches for larger sizes. This press is designed especially for rags, cotton waste, etc. Many other kinds including hydraulic and screw presses are made by the same firm, adapted for almost every use requiring great pressure.

For fuller particulars the Boomer & Boschert Press Company, 354 West Water St., Syracuse, N. Y., may be addressed.

**RADLEY'S REMOVABLE SLEIGH-RUNNER.**

Owners of wagons of every description, and who wish they had sleighs instead when snow is on the ground, will be interested in the special construction of sleigh runners shown in the accompanying illustration, which forms the subject of a patent recently issued to Mr. John Radley, of No. 104 Manhattan Avenue, Jersey City Heights, N. J. The parts are designed to be readily separated or put together without the use of tools, and may be conveniently carried in the vehicle to which they are to be applied. Besides the usual tires, the runners have each a side shield, extending slightly above the surface of the runner, and in the runners are set threaded blocks, in which are removably secured, by means of thumb-screws, the lower



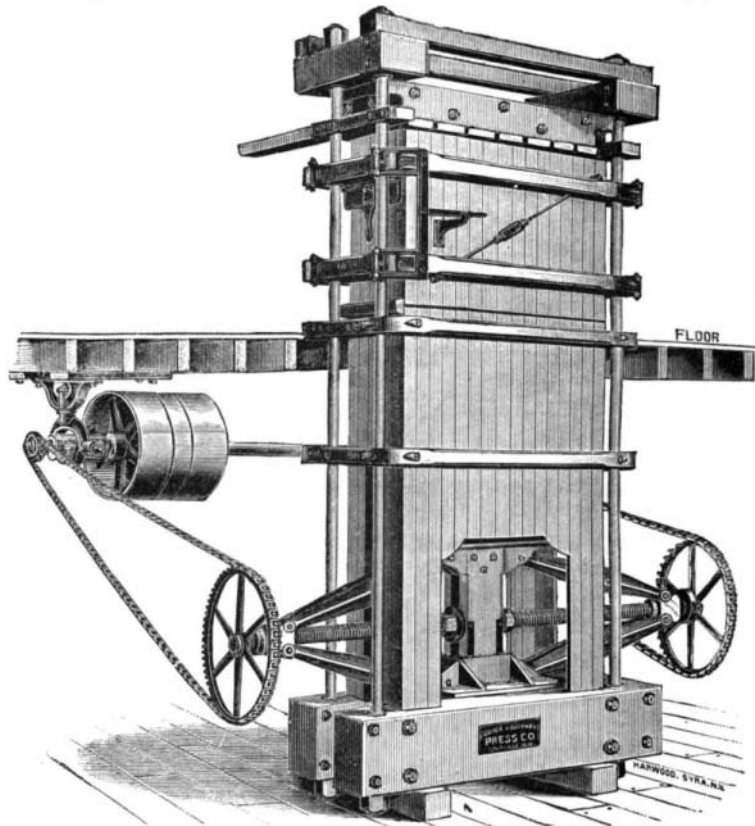
A SLEIGH-RUNNER FOR WHEEL VEHICLES.

ends of wrought iron legs, bent inwardly in their upper portion to pass clear of the hubs. The legs are designed to be all of the same length, and to be adapted to the varying heights of axles by changing their place of attachment to the runner. At the top, the legs are pivoted together in pairs respectively on each end of a cross-bar adapted to be secured to the axle, each cross-bar having loops provided with straps and buckles. For use with the front axle a chain attachment is also provided, to form a complete check on the revolving gear and fasten it more firmly to the sleigh. The double sleigh-runners are only intended for heavy trucks, to promote convenience in turning, etc., and are in all respects similar to the runners for a single sleigh. These runners can be removed from a vehicle in a few minutes, should the sleighing become poor, or they can be as readily applied when desired. Should the wagon be too heavy to pull into position on the runners, to make the attachment, the thumb-screws securing one of each pair of legs may be removed, allowing the cross-bars to drop down, when the horse may be employed to pull the vehicle on the runners.

THE Académie des Sciences has submitted a new system of musical notation in which twenty-seven characters replace the 203 symbols now employed to represent the seven notes of the gamut in the seven keys.

**Large Locomotives.**

Four monster locomotives have lately been built for the St. Clair Tunnel Company by the Baldwin Locomotive Works. So far as known by the company they are the heaviest single locomotives ever built. Each of the four locomotives is expected and guaranteed by the builders to haul a load of 760 gross tons of cars and lading up a grade of 105 feet to the mile. This is



EXTRA HEAVY RAG BALING PRESS.

equivalent to a train of 25 or 30 loaded freight cars. The St. Clair Tunnel Company, for which the locomotives have been built, controls the line of railroad running through the tunnel under the St. Clair River. It is near the junction of the St. Clair River with Lake Huron and connects the towns of Port Sarnia, Ontario, and Port Huron, Michigan. The line of railroad which runs through the tunnel is the connection of the Grand Trunk Railway of Canada with its line in Michigan. The tunnel is 6,000 feet long, and the approaches are 1,950 and 2,500 respectively, making a total length of over two miles. These approaches have a grade of 105 feet to the mile, and a very heavy locomotive is required to haul heavy trains through the tunnel and up the grade of the approaches.

The locomotives are of the class known as tank locomotives, and have no tender. The tanks are on both sides of the boiler, and their capacity is 2,000 gallons. The space for the fuel, which is anthracite coal, is on the footboard. There are five pairs of driving wheels, which are the only wheels, and they are 50 inches in diameter. The wheel base is 18 feet 3 inches. The cylinders are 23 inches in diameter and have a stroke of 28 inches. The boiler is of steel, five-eighths of an inch thick, and is 6 feet 2 inches in diameter. There are 280 flues,  $2\frac{1}{4}$  inches in diameter and 13 feet 6 inches long. The firebox is 11 feet long and  $3\frac{1}{2}$  feet wide.

The cab is placed on top of the boiler and midway between its ends. There are two sand boxes, one on the front of the boiler and one on the back, so that sand can be placed on the rails whether the locomotive is running forward or backward. There is a powerful air brake which operates on each driving wheel. There are headlights and steps at both ends, like those of a shifting engine. The locomotive will run on 100 pound rails. In working order the weight is 195,000 pounds.

**Utilization of Sawdust and Shavings.**

These practically waste substances are turned to account by M. Calmant, of Paris, for the production of a finely divided vegetable charcoal, which is intended to be applied for the removal of unpleasant flavor in ordinary French wine, otherwise unsalable as wine, although suitable for distillation. The charcoal is also available as a filtering medium, especially in distilleries, where it is said to be capable of filtering forty times its volume of alcohol, whereas the vegetable charcoal of commerce, gradually becoming scarcer and dearer, and which requires grinding and often recarboniza-

tion, will only filter about three times its volume. If not already separate, the sawdust of hard and soft woods must be separated, because the former requires a heat of 700° Centigrade, whereas 500° Centigrade suffice for carbonizing the latter. Carbonization, which lasts about an hour, is effected in fire clay, plumbago or cast iron retorts, of about 600 cubic inches capacity. But previous to this process the sawdust must be sifted, first through a coarse screen to remove splinters and extraneous matter, and then through a fine sieve, which only permits passage of the actual wood dust with the adherent calcareous matter. The product of carbonization must again be sifted to get rid of this calcareous matter which has become detached during the process, when it will, if the operation has been carefully performed, resist the action of hydrochloric acid. Shavings of either hard or soft woods, also kept separate, must be subjected to preliminary treatment (which consists in a beating, to detach the adherent dust, and then a high degree of compression in a hydraulic or other press), when they are carbonized in the same manner as the sawdust, and then ground in a mill to reduce them to the same degree of fineness. Great care must be exercised to prevent the charcoal absorbing moisture from the atmosphere, and with this object it must be inclosed in air-tight recipients till required.

**The Stanford University.**

Senator Leland Stanford has chosen for president of his new university Dr. David S. Jordan, who has been president of the Indiana University for the past seven years. The term of office at Palo Alto will begin next September, the salary being \$10,000 per annum and residence. Professor Jordan is a scientist of acknowledged ability and standing, and has had also abundant experience as an educator. He is a broad-minded man

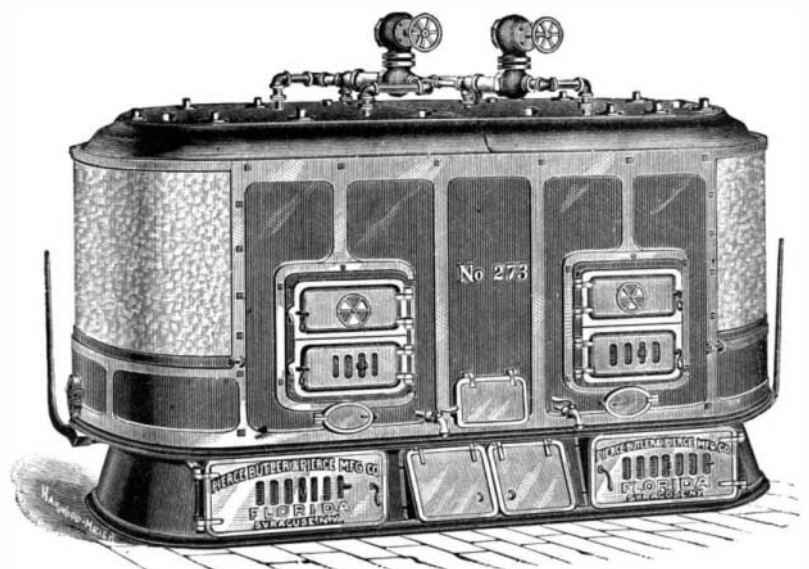
of great energy and activity, who should be just the one to organize and equip the new institution of learning. For several years he has been president of the Indiana State University, having been selected for the position because of his large executive capacity. He is about forty years of age.

**THE "FLORIDA" HEATER FOR SOFT COAL.**

The heater shown in the accompanying cut is made for warming all classes of buildings by steam or hot water circulation and is designed for soft coal combustion. The idea of its construction is by large exposure of heating surface to effect economy in fuel, and by a properly designed flue system and by surface burning to avoid smoke. It is really a substitute for the expensive and heavy tubular boiler. It is made in sections, each representing a deeply corrugated and very peculiarly shaped ring. Within a series of such annular compartments the water is contained. The sections are of such size that a couple of men can handle them and set them up. All parts are accessible for cleaning purposes. The complete set of heating chambers as set up are surrounded by a galvanized iron jacketing like any portable furnace. The jackets are also lined with asbestos, thus economizing fuel.

The number of square feet of radiator surface that a single heater will supply varies with its size, ranging from 250 to 7,300 square feet.

As the heater presents every appearance of an



IMPROVED "FLORIDA" SOFT COAL HEATER.

ordinary furnace, no special provision is needed for it. It can go wherever a hot air furnace can be placed.

For further particulars as to this heater and its adaptability to particular requirements, address the manufacturers, the Pierce, Butler & Pierce Manufacturing Company, Syracuse, N. Y., U. S. A.