

raised, as seen in the illustration; and when the animal steps off, the platform will return to its normal position, and the cover will automatically close over the trough, the cross bars across the top preventing the stock from putting their feet in the trough, and defiling the water. The trough is made in two compartments, of which the one at the left, in the engraving, receives water direct from a tank or reservoir. This compartment is connected with the other by an opening, so that the water will always stand at the same height in both compartments, but the height of the water in the first division is controlled by a stop cock



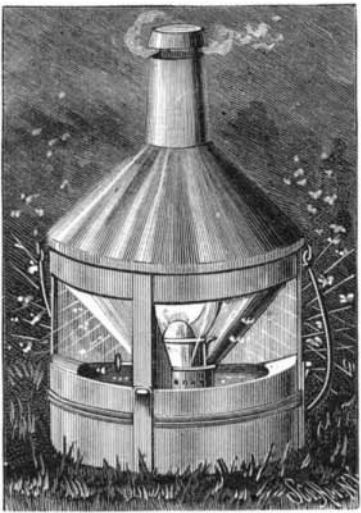
McFARLAND'S DUMPING WAGON.

actuated by a float, which admits water when it falls below a certain level and cuts off the supply as it rises above that level, so that there can be no overflow or waste of water. The sides, ends, and bottoms of the trough, and its covers, are all made with double walls, the space between them being carefully packed with asbestos millboard, as a non-conductor of cold or heat, making a substantial protection against the freezing of the water in cold weather, a difficulty which many of the farmers in some of our Western States, where water is scarce, have found to be a most serious one. The cover has a small aperture with which the interior of the trough may be ventilated, and the interior partitions are so made that they can be readily removed for cleaning.

This invention has been patented by Mr. Thaddeus W. Boies, of Beloit, Kan.

**INSECT DESTROYER.**

During the past summer the insect destroyer shown in the accompanying engraving gave most satisfactory results during thorough and practical tests by the inventor, Mr. Dudley H. Manning, of Sibley, Iowa. The under surface of the conical top, through the center of which the chimney passes, is bright, as are also the partitions that extend inward from the upright of the frame and carry the socket for receiving the lamp.



Panes of glass are held between the inclined inner edges of these partitions, thus forming an inverted conical glass casing around the lamp. The entire apparatus is placed on top of a vessel partly filled with water. The various mirrors reflect the light upon the water, illuminating it very brightly. Insects of nocturnal habits—moths, beetles, etc.—fly toward the light and into the brightly illuminated water, where they perish, or, striking the cone, are thrown downward into the water. An inverted conical ring placed just above the water prevents their escape. The water in the pail may be poisoned or may be sweetened. The top can be easily detached from the base, and the whole apparatus can be carried from place to place by the bail.

MESSRS. PEARS, the celebrated English soap makers, and remarkable for the extent and novelty of their advertisements, offered some time ago a prize of £100 for the best essay on "The Depression of Trade." The general purport of the essays is to the effect that depressions are periodical, and followed by activity; that the present depression is not worse than others that have preceded it; that a future of prosperity must be close at hand; that the causes of the depression are most complex, and the remedies must be similarly various.

**AN IMPROVED DUMPING WAGON.**

From the accompanying picture the reader can readily understand the general principles on which this wagon is built, but it has some novel features calculated to attract the attention of makers and users of wagons of this character. The box and its supporting frame are slightly wider at the rear than in front, yet the guide pieces are made to work back and forth in parallel lines, so that the box will readily free the load in dumping, while the gear for moving the box is at the back of the chair of the wagon, where the front wheels will come back of it and not interfere with turning the wagon in short curves. The operation of the shafts and intermeshing gear wheels, in connection with the connecting rod and rack, for moving the box of the wagon back and forward, will be readily understood from the engraving, there being hooked guide plates on the sliding frame of the box that engage pinions on the sills of the wagon to limit the backward movement of the box.

There are also plates on the forward end of the sliding frame of the box, which lock in loops on the sills as the box is moved forward, the locking devices preventing bouncing of the box when the wagon is going over rough roads or pavement.

This invention has been patented by Mr. James McFarland, of 235 Main St., Louisville, Kentucky, and wagons are being made according thereto at the factory of Mr. William Tingley, No. 231 East Main Street, in that city.

**HAMMER FOR WELDING LOCOMOTIVE FRAMES.**

Near the center of the base plate is mounted a steam hammer, grouped in a circle around which are three furnaces, the one in front being provided with two fires and used for heating the main frame and braces, and the side ones for heating the legs of the pedestals. In the front edges of the standards of the hammer are grooved guides, in which slides the hammer head, provided with removable plates carrying the various dies used in welding the different parts of the frame. The anvil is made with an extension placed between the standards, and fastened by a bolt and nut to the base plate of the hammer. A slot in the extension, through which the bolt passes, makes the anvil adjustable, so as to weld on its center or on its front horn, as desired. On top of the anvil are guide stops, against which rests the rear edge of the pedestal of the frame while being welded, and it is provided on each side with pivoted catches to hold the pedestal in place. At each side of the standards is a davit for lifting and swinging the legs of the pedestal to and from the hammer and side furnaces. The main base plate carries a swinging crane having chains, pulleys, runners, etc., to which the pedestal of the frame is attached near its ends, so as to be easily manipulated under the hammer, and be swung to and from the main furnace. Passing through holes near the lower ends of the side plates are steel pins; on one pin is a bushing for forging the rounded outside part of the pedestal to which the legs are welded, and on the other pin is a die shaped to forge the inclined inside of the pedestal.

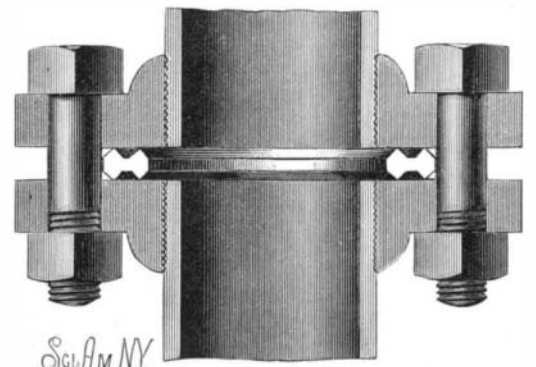
Fastened between the plates by pins is a center bar, Fig. 3, which reaches to and enters a recess in the bottom of the hammer head. The dabs to be welded are placed between the bushing and die, when the hammer head strikes the dab through the center bar and forges it to the leg, as shown by the dotted lines, Fig. 3. The bushing and its pin, and the center bar, are then removed, and the leg of the pedestal is placed between the plates and against the die, when the bushing is replaced. The pedestal of the frame to which the leg is to be welded having been formed under the hammer to the desired shape for the lower end of the leg, the frame is swung from the main furnace to the anvil, and the heated leg set in position on it, as shown by the dotted lines in Fig. 1. The hammer head then strikes the top of the leg and forges it to the pedestal, the bushing, die, and side plates acting as guides for the leg. On the lower end of the outer plate is a

steel cutter that assists in welding, and cuts the sides to the proper size of the pedestals. The leg can be taken from the plates by removing the bushing. Fig. 4 is a front elevation of the hammer block, showing a die for welding the braces to the frame. The braces are heated with the main frame over the front furnace, which is provided with two fires.

The difficulty of obtaining perfectly welded locomotive frames by blows of heavy sledges is well known; but by means of the hammer above described each weld can be perfectly made, and the parts can be easily handled and brought under the hammer. The inventor of this hammer, Mr. John R. James, of Dunkirk, N. Y., is confident that with this hammer and the aid of three men he can do more and far superior work than with seven men in the old way.

**PACKING FOR STEAM PIPE JOINT.**

The accompanying illustration represents two meeting lengths of pipe, each of which is threaded to engage with an internally threaded coupling flange. The flanges are united by bolts in the ordinary way, but instead of the usual rubber or soft metal packing ring, a steel or iron ring is placed between the flanges. This ring consists essentially of two or more concentric ridges projecting from each side of a central web. The bearing edges of these ridges are V-shaped, and all are of the same height; and, being sharp and preferably made of steel, they will, to a certain extent, cut into the flanges. It will be seen that the packing ring may



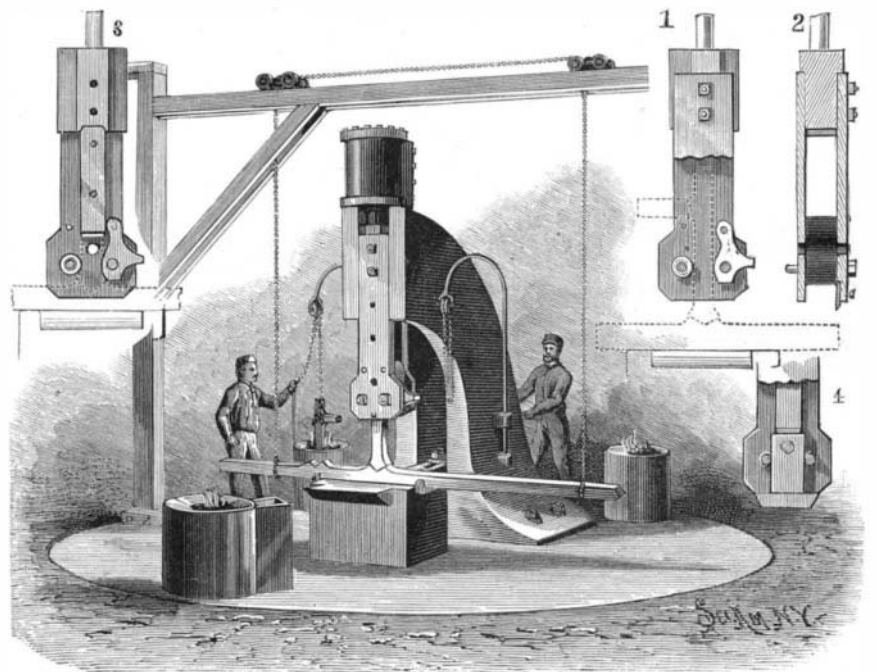
LYONS' PACKING FOR STEAM PIPE JOINT.

be used upon the ordinary form of flanged coupling piece, without the slightest alteration of the coupling. This packing is more particularly designed for use when the joint is subjected to a high degree of heat.

This invention has been patented by Mr. J. B. Lyons; further particulars can be obtained by addressing F. L. Hirschmann, M. D., of Norway, Mich.

**Artificial Leather.**

Artificial leather is, according to a French invention recently patented, made by a cotton fabric, the warp threads of which are very slightly twisted, and the weft threads of which are finer than usual. This fabric is serrated on both sides, and immersed in a preparation consisting of a decoction of linseed, rabbit skin glue, linseed oil, and coloring matter. When the fabric is impregnated with this preparation, it is stretched upon a polished zinc plate laid upon a steam heated hot



JAMES' HAMMER FOR WELDING LOCOMOTIVE FRAMES.

plate, the drying being continued until the aqueous portion is entirely evaporated. It is claimed that this artificial leather is an excellent imitation of the real thing.

FARADAY proved the magnetic condition of matter, and that magnetism, unlike electricity, cannot be insulated.