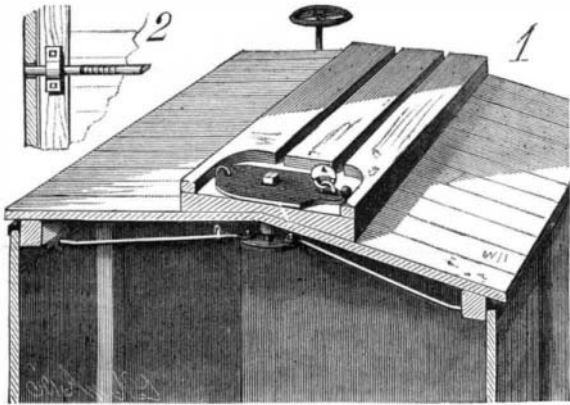


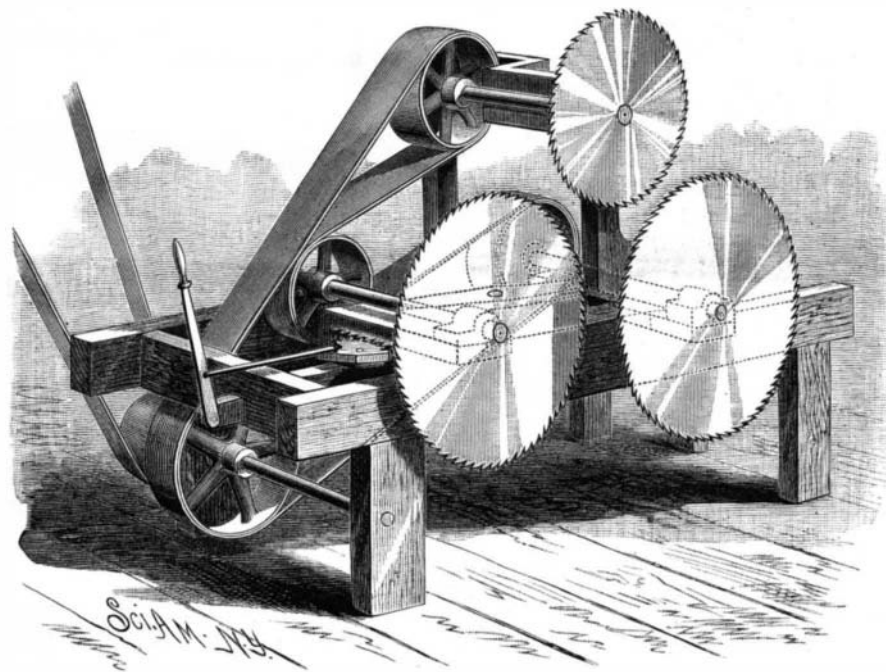
**IMPROVED FREIGHT CAR DOOR LOCK.**

This lock for the sliding doors of freight cars is operated from the roof of the car; it is simple in construction, safe, and reliable. The squared upper end of a vertical shaft journaled in the roof of the car projects into a recess in the gang planks. In one end of the recess is hinged a hasp provided at its middle with a square hole fitting the end of the shaft; the free end of the hasp has a slot to receive a staple. Secured to the



**ABBOTT'S IMPROVED FREIGHT CAR DOOR LOCK.**

lower end of the shaft is a disk, to opposite points of which are pivoted rods which extend to the sides of the car, and can be passed into holes in the upper parts of the doors. The rods are guided by clips on the under side of the top beams of the sides, as indicated in Fig. 2. The position of the locking rods is shown by a groove in the top of the shaft, which extends in a direction across the car when the doors are locked. To lock the doors, the shaft is turned by means of a key, to move the rods toward the sides, when the hasp is placed over the squared end of the shaft, the staple passing



**MOORE'S CIRCULAR SAW MILL.**

into the slot. A padlock is then passed through the staple and sealed, or a car seal of the usual form can be passed through the staple and closed.

This invention has been patented by Mr. James Abbott, of 836 North Main St., Elmira, N. Y.

**CIRCULAR SAW MILL.**

The shafts carrying the two lower saws can be moved longitudinally in their bearings, to bring the saws alternately in position for action. One end of each shaft is held in a bearing secured to the side piece of the frame, and the other end revolves in a bearing secured to a heavy bar sliding endwise in the main frame of the machine, for shifting the shaft and saw attached to it. Upon one of the moving bars is a rack with which meshes a pivoted toothed segment operated by a hand lever, to move the bar in either direction. This construction is clearly shown at the left in the engraving. The other moving bar is operated from the first one by a centrally fulcrumed lever, the ends of which enter recesses formed in the facing edges of the two bars. The belt from the driving pulley passes over the pulley on the shaft of the saw at the right hand, then around the pulley driving the second lower saw, then over the pulley on the upper shaft. In this manner of applying the belt the lower saws are revolved in opposite directions, both toward the center of the machine. The teeth of the saws are pitched toward the center, so that one will act when the log is carried in one direction, and the other when the log is moved back, the required saw being brought forward by operating the lever. The lower saws may be made with their teeth pitched in opposite directions, outward toward the

ends of the machine, and revolved away from each other, so that they will cut in opposite directions when the log is moved back and forth. In this case the shafts are not shifted, and the saws revolve in the same plane. The top saw runs in the same plane with the saw that is moved out for action.

This invention has been patented by Mr. John P. Moore, of Snow Hill, Maryland.

**The Transportation of Young Shad.**

The United States Fish Commissioner's car recently arrived at Portland, Oregon, with a large consignment of young shad. It started with a million, but about three hundred thousand died *en route*. Half a million were placed in the Columbia River, at Wallula Junction, and the remainder in the Willamette River, at Albany. During the journey across the continent, the experiment was made of hatching the shad in the car while *en route*, and proved entirely successful. Six hundred thousand eggs were taken into the car at Havre de Grace, Md., and placed in four Macdonald jars. A pump was kept constantly at work moving the water to preserve its freshness. In addition, fresh water was obtained at every available point. During the nine days' journey, which covered a distance of 3,000 miles, fully 95 per cent of the eggs were hatched. Most of the loss was due to premature hatching.

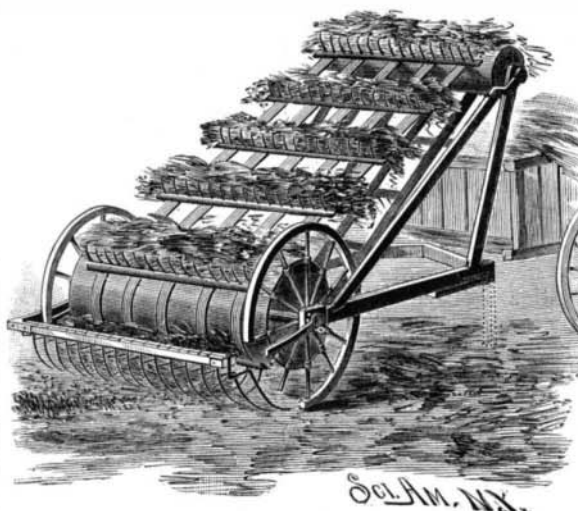
These prairie-born shad have also been placed in the Willamette River at Albany.

**HAY LOADER.**

This hay loader collects the hay from the ground, raises it to a suitable height, and discharges it upon the hay rack of the wagon. The wheels are rigidly attached to the axle, to which, or to the spokes of the wheels, is secured a large drum. The ends of the axle revolve in bearings near the rear ends of side bars of a frame, the forward part of which is provided with a staple to engage with a hook attached to the rear end of a hay rack. To the upper ends of inclined and properly braced standards secured to the forward ends of the side bars, is journaled a small cylinder. Around the two cylinders are passed endless belts united by cross bars, to which are attached teeth having their outer parts curved forward slightly, so that they will take hold of the hay more surely, and carry it up the elevator and discharge it more readily at the upper end. Upon a cross bar uniting the rear ends of two bars pivoted to the ends of the axle are held the rake teeth, which are bent forward and then downward, and their lower parts are curved forward until the lower ends are near the ground beneath the axle.

As the machine is drawn forward, the rake teeth collect the hay, and the carrier teeth carry it up over the small cylinder and discharge it into the hay rack. In the rear ends of the side bars of the frame are holes to receive a pin, by which the rake teeth can be raised more or less from the ground. When detached from the rack, the forward end of the machine is supported upon a hinged leg.

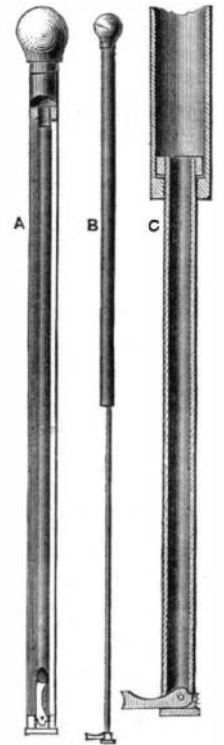
This invention has been patented by Mr. B. D. Spilman, of Fort Meade, Dakota.



**SPILMAN'S HAY LOADER.**

**EXTENSIBLE CANE, ETC.**

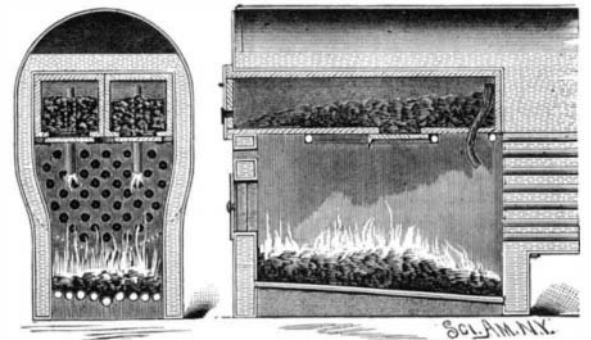
The object of this invention, patented by Mr. Arland H. Allen, of Red Wing, Minn., is to provide an extensible rod adapted to various uses, but more especially for closing the lids of outside burial cases after the cases are lowered into the grave. At the upper end of the tube forming the body of the cane is the usual head, and at the lower end is an internally threaded flange. Within this tube is a second one having a collar at its upper end and a cap at its outer end threaded to fit the flange. In a slot through the end of the inner tube and cap is pivoted a hook formed with a shoulder engaging with a shoulder on the tube, when the hook is unfolded as shown at C. When the rod is contracted, A, the inner tube is held within the outer one by the cap screwing into the flange. When the rod is extended, B, the inner tube is drawn out, so that its collar engages with the flange. The hook is then opened, C, so that it forms a right angle with the tube. The lid of the burial case is closed by bringing the hook into engagement with a staple projecting from the free edge of the lid. This device may also be used for reaching otherwise inaccessible objects in show windows and other places.



**FURNACE FOR BURNING FINE COAL.**

The accompanying views show a furnace for burning soft coal screenings, commonly known as "slack" or "culm," either alone or in combination with hard coal or coke screenings. This furnace is the invention of and has been patented by Mr. Anton Hardt, of Wellsborough, Pa. Above a firebox of ordinary form are placed two fireclay retorts, similar to those employed in gas works. In the bottom of each retort is an opening that may be closed by a slide, made of fireclay, and near the rear end of each retort is a fireclay tube, extending upward to near the top and downward within the firebox. The front ends of the retorts are closed by doors provided with peep holes. The fire is started in the usual way on the grate, and when sufficiently hot the retorts are charged with fine coal. After the coal has been converted into what the inventor terms "semi-coke," one of the slides is drawn forward by an implement inserted through an opening just below the retorts, when the coke drops down upon the fire, being shoved and drawn to the opening.

After one retort has been emptied it is refilled with fine coal, and as soon as required the second one is



**HARDT'S FURNACE FOR BURNING FINE COAL.**

emptied and filled again, the retorts being used alternately. The gas driven out of the coal passes through the tubes into the firebox, where it ignites and furnishes additional heat.

**Cleaning Petroleum Pipes.**

The pipes by which petroleum is transported from the oil regions to the seaboard are cleaned by means of a stem 2 1/2 feet long, having at its front end a diaphragm made of wings which can fold on each other, and thus enable it to pass an obstruction it cannot remove. This machine carries a set of steel scrapers somewhat like those used in cleaning boilers. It is put into the pipes and propelled by the pressure transmitted from the pumps from one station to another. Relays of men follow the scraper by the noise it makes in its progress, one party taking up the pursuit as the other is exhausted. They must not let it get out of their hearing, for if it stops unnoticed its location can only be established by cutting the pipe.