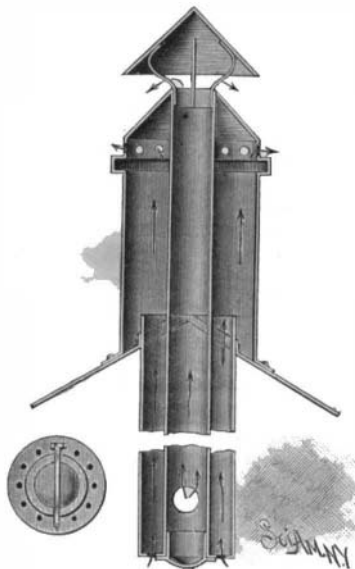


**COMBINED CHIMNEY AND VENTILATOR.**

The central flue or chimney proper is upheld by an exterior casing provided with a foot plate arranged to be secured to the roof of the building. This foot plate extends inward toward the flue, but does not touch the flue, there being connected to the inner flanges of the plate an incasing tube extending downward and with-



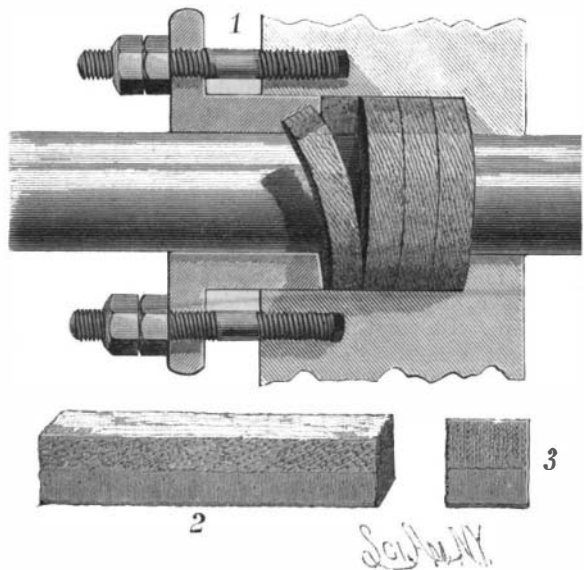
**EBERHART'S COMBINED CHIMNEY AND VENTILATOR.**

in the apartment where the stove is located. The bottom of the flue is closed by a perforated ring and a soot box held in position by a clasp, while above the flue there is a conical cap. The exterior casing is rectangular and the top is pyramidal. It will be seen that there is a continuous air space reaching from the lower to the upper end of the flue. This space acts as an outlet for the vitiated air of the apartment, which finds an escape through openings in the top of the casing. This current of air, besides ventilating the apartment, prevents any excessive heating of the casing or inclosing tube. The stove pipe is inserted through a hole as shown in the lower part of the cut. This chimney is easily cleaned, and, as its entire weight is supported from the roof, it may be placed in any position desired.

This invention has been patented by Mr. John S. Eberhart, of Laporte City, Iowa.

**WHITE RUBBER BACK (SQUARE PISTON PACKING).**

Anything which will add to the durability and efficiency of the packings used in steam engine cylinders, valves, and stuffing boxes cannot fail to command the earnest attention of engineers and mechanics, and we therefore illustrate a recently patented improvement of the New York Belting and Packing Company in this direction. That part of the packing which comes in contact with the piston rod is made of successive thicknesses of cotton duck, cemented together with an elastic lubricating compound; but a dark rubber has heretofore been used, with which, under the high temperature to which such packings are often subjected, the rubber back loses its elasticity, and fails to act as a spring to keep the packing against the piston rod. The improved packing is designed to overcome this defect by combining with fine Para rubber a special



**AN IMPROVED PISTON PACKING.**

lubricating compound, capable of withstanding a high degree of heat for a long period. This packing is warranted to stand a temperature of 50° F. higher than the regular dark rubber piston packing, and to endure 300° F. for a long period. It may be applied in separate pieces, as washers, as shown in our illustration, or in a continuous piece with the ends skived off to make a square fit. Figs. 2 and 3 are side and end views of this description of packing the convenience, durability,

and satisfactory working of which, even as heretofore furnished, have long made it a favorite with those having charge of the running of steam machinery.

This packing is made only by the New York Belting and Packing Company, No. 16 Park Row, New York city.

**Natural Gas for the Cambria Iron Company.**

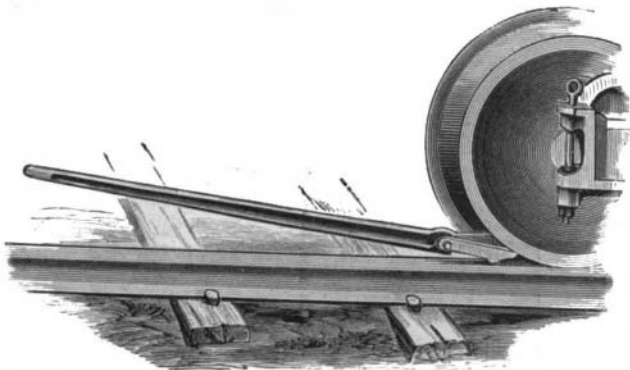
The new natural gas district at Grapeville, Pa., some miles south of the now famous town of Murrysville, promises to be of increasing importance. The second well has been drilled, and affords a larger show of gas than the pioneer boring. Four or five additional wells are being put down, and the future of the district is regarded as assured. A ten inch pipe line has been projected to carry the gas to Johnstown, a distance of about thirty-five miles. It is designed to supply the large iron and steel works of the Cambria Company, and also the 30,000 citizens making up the population of Johnstown and the associated boroughs. About five miles of the line have now been laid, and a large force of men are pushing the work forward. It is probable that the line will be completed some time in August or September.

We are indebted to Mr. John Fulton, M.E., for our information and for the following analysis of the Grapeville gas:

	By Volume.	Heat Units developed by Combustion of 100 Liters.
Hydrogen (H).....	7.05	21,866.13
Carbon dioxide (CO <sub>2</sub> ).....	0.58	0.00
Oxygen (O).....	0.16	0.00
Ethylene (C <sub>2</sub> H <sub>4</sub> ).....	0.17	2,519.92
Carbon monoxide (CO).....	0.22	860.00
Marsh gas (CH <sub>4</sub> ).....	35.08	297,548.56
Ethane (C <sub>2</sub> H <sub>6</sub> ).....	28.87	447,171.47
Nitrogen (N).....	27.87	0.00
	100.00	769,765.98

**A COMPOUND LEVER PINCH BAR FOR MOVING CARS.**

The bar herewith illustrated has a short lifting arm or nose adapted to bear with its sharp or edged end against the face of the car wheel, with a pivoted ful-



**SHELDON'S COMPOUND LEVER PINCH BAR.**

crum portion made bifurcated and straddling the lower end of the handle and the other nose, so as to rest on the top of the rail. The fulcrum is formed by a removable bar of steel inserted in a socket in the under side of the pivoted portion, and the noses of the two portions that come in contact with the wheel are also removable, and formed of the best tool steel, case-hardened, so they can be changed to use all edges, and when worn out can be replaced by new ones at a trifling cost. It will thus be seen that the bar works on the wheel in two places, the lower nose exerting principally a lifting action, while the upper one tends to turn the wheel, so by the joint action of both the wheel is moved with facility and with greater speed, by a less application of power, than with ordinary pinch bars. This bar will work on a frosty track without trouble; and, although the patent therefor was issued only about three months ago, it is already meeting with an active demand, especially from tanners, foundrymen, mill owners, and manufacturers generally who have occasion to load freight direct into cars on side tracks leading to their establishments, some testimonials of representative houses of this class speaking very highly of its efficiency.

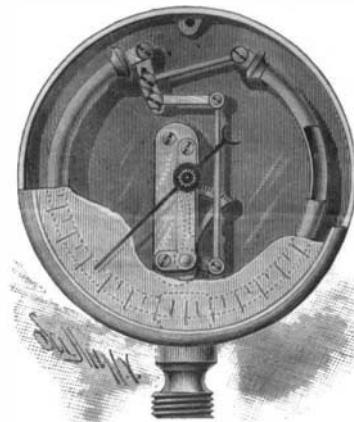
This invention has been patented by Mr. Mark A. Sheldon, whose address is Corry, Pa. Further particulars will be found in our business and personal column.

**Steamboats Wanted.**

On the northern shore of that beautiful body of water just back of New Orleans known as Lake Pontchartrain lies the Parish of Saint Tammany. It is noted among the parishes of Louisiana for its healthfulness, much of the land being fully a hundred feet above the level of the lake. The country is gently undulating and contains a number of mineral springs, some of which, such as those at Abita, have become noted places of resort. The present steamers, running at the rate of only eight miles an hour, have refused to carry the mails daily to Covington, a distance of 45 miles from New Orleans, for \$4,800 per annum. It is believed that a good, swift service would build up this section into a charming suburb of New Orleans.

**PRESSURE GAUGE.**

The pointer is mounted on the end of a shaft carrying a pinion engaging with a segmental pivoted rack formed with an arm to which is pivoted the lower end of a rod, whose other end is pivoted to one end of an angle lever, having a segment shank pivoted to the end of a curved spring tube, having its adjacent ends closed in the usual manner. This shank is formed with a segmental slot, through which are passed two screws into an adjusting plate on the back of the shank. The lower screw serves to clamp and lock the plate in place.



**KUNKLE'S PRESSURE GAUGE.**

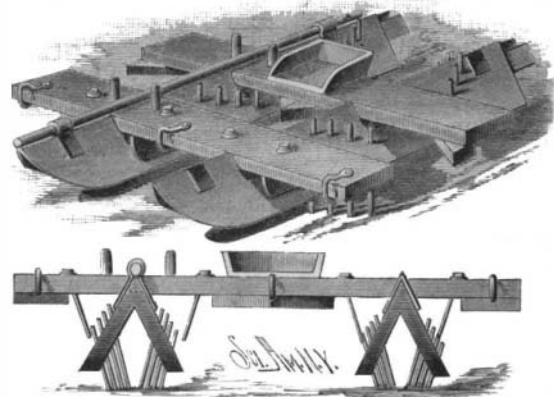
and the other serves as a pivot for one end of a rod pivoted to the opposite end of the spring tube. When the movement of the pointer over the dial is not quick enough, the plate is raised and then locked in place, and when too rapid the plate is lowered. The plate can be adjusted up or down the full length of the slot without changing the position of the index at its starting point, and at the same time the gauge will be made to run fast or slow, just as required. The gauge can thus be adjusted very easily and rapidly without removing or interfering with the pointer, which is a matter of considerable importance, especially when a number of gauges are to be adjusted.

The spring tube is secured at its center in a tubular neck which is firmly held in the casing. The front edge of the case has an internal screw thread, into which screws the neck of the crystal holding ring; a spring ring holds the crystal or glass in place.

This invention has been patented by Mr. E. B. Kunkle. Further particulars can be had from Messrs. E. B. Kunkle & Co., of Fort Wayne, Ind.

**LISTED CORN CULTIVATOR.**

The engraving represents a light and durable cultivator, the invention of Mr. A. I. McCandless, of Vining, Kansas, adapted for cultivating listed corn for the first, and possibly the second, time. One of the two troughs is rigidly connected to the cross bars, while the other is movably connected. Mounted in the sides of the troughs are steel pins arranged in sets; the pins in the forward set are placed in lines converging toward the front, while the others converge toward the rear. All the pins project about two and a half inches below the level of the bottom of the troughs, and all are at a slight angle toward the rear. The forward cross bar carries a half moon cutter at each side of each trough. The movable trough can be moved outward or inward between limit pins, its upper edge being formed with recesses, through which the cross bars pass, and being provided with metal straps encircling a rod arranged above the cross bars, as shown in



**MCCANDLESS' LISTED CORN CULTIVATOR.**

the upper view. Upon the under side of the rear cross bar are arranged four stops. The front cross bar has three clevises, so that the device can be drawn by one, two, or three horses. In use, this cultivator will be found to bring down the loose earth to the corn, without covering it up, and all weeds on the slopes will be cut down by the cutters. The slight play given to one trough enables it to follow any irregularities there may be in the laying out of the rows.

**Boiler Iron Shovels.**

A Shanghai paper states that a novel branch of industry has recently sprung up at Chefoo. It is the manufacture of iron shovels. They are made from old boiler tubes. Hundreds of men and boys are now engaged in this business. The old tubes are cut into short cylinders, just the length of the shovel, and then ripped open, flattened out, and hammered into shape. Piles of these old boiler tubes may be seen everywhere in the back courts of the native Hongs. Mule loads of these shovels are to be seen every day going into the country, and I learn that for one or two hundred miles in the country there is now scarcely a farmer that has not an iron shovel. The prices vary from 25 to 40 cents apiece according to quality, thus bringing this useful instrument within reach of all.

**POWERFUL AUTOMATIC CAR COUPLER.**

The drawhead is secured to the car in any suitable manner, and, is formed of the front and rear walls, B B', properly bolted together. Sliding laterally between these walls are the jaws, C C, which have noses at their inner ends and are pressed toward each other by springs, D, encircling guide rods which pass through openings in the sides of the drawhead. The guide rods are operated by chains leading to levers mounted on the cars, so that the jaws can be moved in opposite directions, thereby separating them for uncoupling. This construction is designed particularly for freight cars, because the jaws are not locked when coupled, and a slack is obtained between the cars.

For heavy passenger and parlor coaches, the jaws are formed with lugs, L, projecting through slots in the rear walls of the drawhead; attached to the lugs are chains, F, or preferably rods, operated by levers from above, which lock the jaws when the cars are coupled and withdraw the jaws for uncoupling. When the cars approach each other, the pointed, conical, or spear shaped coupling bar, J, enters the drawhead between the jaws, forcing them apart. When the shoulder of the head has cleared the back of the jaws, the springs force the noses of the jaws toward each other, causing them to take firm hold of the head of the coupling bar. In order to adapt the coupling bar for use with old style couplers, it has a hole at each end to receive the pin and a slot to receive the link. At about the center of the bar is a shoulder, M, made long enough to span the drawhead opening, so that when the cars approach each other it will control the extent of the entrance of the bar into the head.

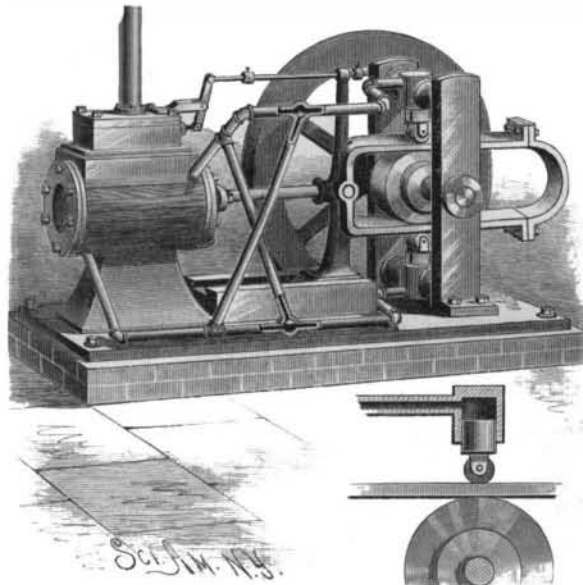
The inventor of this coupling claims that the coupling bar is equal in strength to the drawhead, thereby doing away with the weak link between the cars, and preventing them from separating in case of derailment. The shoulder, M, also acts as a safeguard by controlling the lateral movement of the cars. It is further claimed that the cars cannot mount, overturn, or separate from each other, and that there is uniform strength throughout the train to resist the shock of collision. This coupler can be adapted for use with varying heights of drawheads, and dispenses with all lever links and pins.

The inventor of this coupling, Mr. D. B. Gray, whose address is Germantown, Philadelphia, Pa., will furnish all further particulars; or Mr. John A. Wiedersheim, attorney, Record Building, Philadelphia, Pa.

THE greatest length of Lake Superior is 335 miles; its greatest breadth is 160 miles; mean depth, 688 feet; elevation, 627 feet; area, 82,000 square miles.

**A NOVEL STEAM ENGINE.**

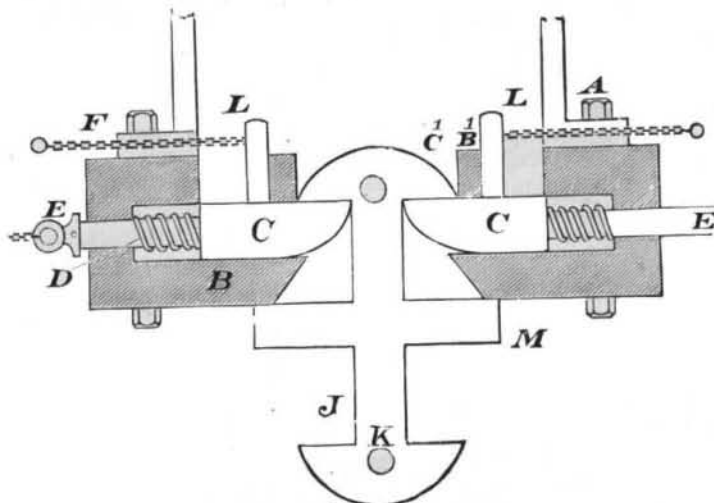
This steam engine is so designed that the reciprocating motion of the piston is converted into rotary motion without the use of a crank or of racks and pinions. It also obtains a uniform leverage throughout the entire stroke, thereby avoiding loss of power



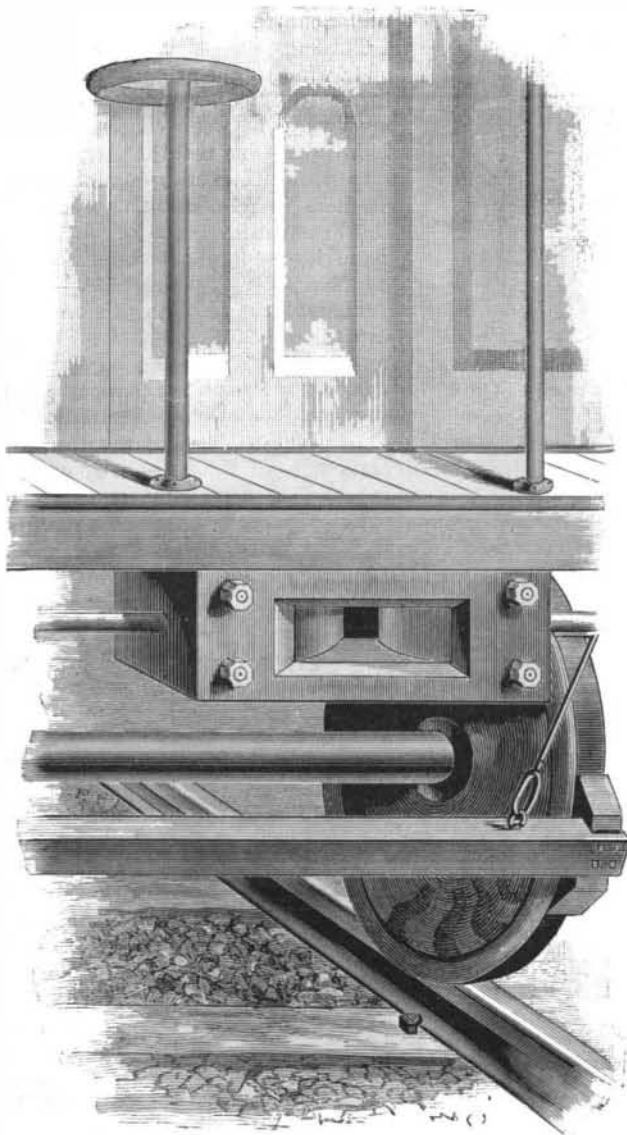
**WEBB'S NOVEL STEAM ENGINE.**

due to use of the crank. A yoke carried by the piston rod is so arranged as to alternately engage opposite sides of a friction wheel mounted on the main shaft. On each side, above and below this wheel, is a small cylinder whose piston rod carries at its outer end a friction roller. These pistons are actuated by steam led from the main cylinder through suitably arranged pipes so as to alternately press the upper and lower rollers against the side bars of the yoke, which pass between the rollers and friction wheel. Steam admitted to the forward end of the main cylinder not only acts upon the piston to force it back, but simultaneously acts upon the small upper piston, whose roller is forced against the upper yoke bar, which is pressed into frictional contact with the

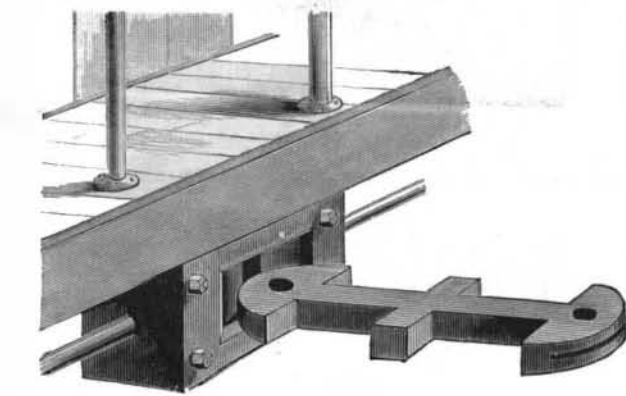
upper surface of the wheel, which is caused to rotate. The greater the steam pressure in the main cylinder, the greater will be the pressure upon the bar. When the main piston has completed its rearward stroke, a



**Fig. 2.—PLAN VIEW—AUTOMATIC COUPLING.**



**Fig. 1.—GRAY'S AUTOMATIC COUPLING ATTACHED TO PASSENGER CAR.**



**Fig. 3.—COUPLING BAR IN POSITION TO ENTER DRAWHEAD.**

tappet shifts the slide valve so that steam is exhausted from the forward end of the cylinder and admitted to the rear end. This shifts the small upper piston, and causes the lower piston to bring the yoke bar into contact with the wheel, whose motion is continued in the same direction. To reverse the engine, the steam entering the forward end of the main cylinder is conducted by a cross pipe so as to act upon the lower small piston; a similar cross pipe leads the steam from the rear end of the cylinder to the small

upper cylinder. At the junction of the cross pipes with the main pipes there are valves (shown in section in the main view), which can be turned so that steam from either end of the main cylinder can be made to enter either of the small cylinders. The lower cut shows the upper small cylinder in section.

This invention has been patented by Mr. B. T. Webb, of Beaufort, N. C.

**Coffee Eating Habit.**

A correspondent of the *Medical and Surgical Reporter* mentions the case of a young woman of twenty-two who had acquired the habit of eating roasted coffee beans. Though the habit was only of four months' standing, she had eaten as much as half a pound a day, and had only decreased to 4 ounces per day on the earnest solicitation of friends. The effect on her health had been that she became pale, sallow, and nervous; the pulse weakened, the stomach got out of order, and, among other symptoms, there was marked dyspnoea in going up stairs. An attempt to stop the habit was followed in a few hours by intense nervousness, trembling, and a strong desire for coffee.

**The Towers of Silence.**

Colonel Floyd-Jones, writing from India to the *Military Service Journal*, gives an interesting description of the "Towers of Silence" near Bombay, and the Parsee mode of disposing of the dead. The Parsee is a devoted fire worshiper, and most of his prayers are offered at morning and evening, facing the sun. It is perhaps in consequence of this belief that he is so careful in preventing the pollution of the other elements, and that after death his body is placed in an open tower, usually on some eminence, where it is devoured by vultures. These open sepulchres have been appropriately named the "Towers of Silence." In every Parsee dwelling house there is an aperture in the upper or sleeping story, which is usually covered by a grating; but when a member of the household dies, his body is placed on a bier and lowered through the aperture to the ground floor, where it is cared for by a set of priests called Neor-ser-sala, or death men, who prepare the body and clothe it entirely in white. Before the body is removed from the house, however, the forehead is smeared with a species of clarified butter, or "ghee," and the dog of the house admitted. Should the animal lick the butter, it is regarded as a good omen of the departed's future happiness, but its refusal would signify perdition. The death men have no contact with the world at large, and on no account are they admitted to the house, as their presence would

pollute it. Hence it is that the body is lowered to them, in order to make their entrance unnecessary. A procession is then formed, the friends of the dead following the priests to the Towers of Silence, on Malabar Hill. Arriving at the entrance of the grounds, the body is taken in charge by another set of priests, with long beards, who carry it to whichever of the five towers may be selected by the last set of priests. The body is taken through an aperture in the wall of the tower and deposited on a grating. There are three sets of these, one for men, signifying good deeds, one for women, representing good words, and one for children, indicating good thoughts. The

clothing is then removed and torn into pieces, after which it is thrown into another tower and the bodies exposed to the vultures. In a few minutes the birds have stripped all the flesh from the bones. Everything about the grounds is kept as neat as possible, and flowers grow in pretty gardens near the entrance. It is very curious that a religion which otherwise contains so much that is elevating should countenance a mode of burial at once so unnatural and repulsive.