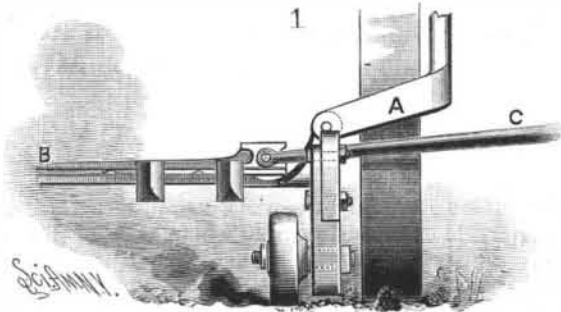


A MOWING MACHINE ATTACHMENT.

A simple attachment, which permits a higher adjustment of the cutter bar of mowing machines from the ground, has been patented by Mr. Alexander White, of Kerbyville, Josephine County, Oregon, and is shown in the illustration. It consists of an independent arm or downward extension piece, adapted to be applied to the arm piece on the front end of the inner shoe—that is, the shoe at the inner or heel end of the sickle bar—



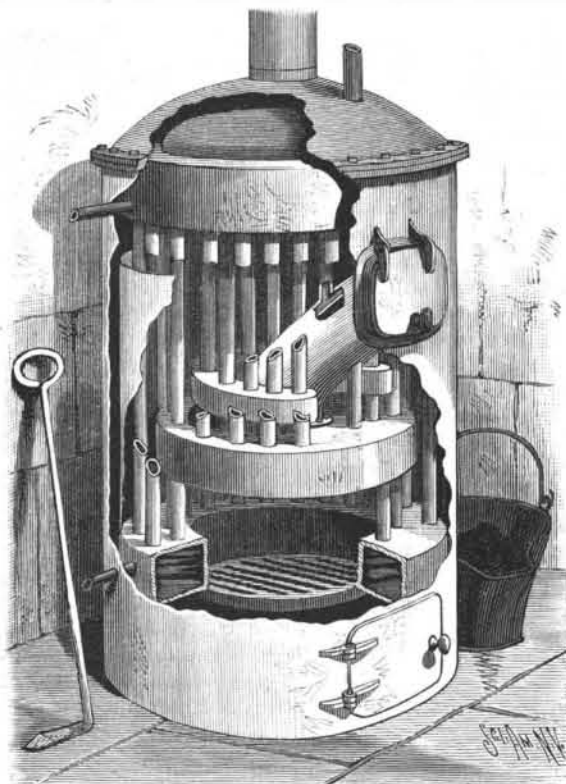
for carrying the axle of the leading wheel or roller at a greater height from the ground than is usually necessary, as may be desirable when running the machine over rough or stony ground, or land in which the main wheels sink. In Fig. 1, A represents the swinging bar by which the cutting mechanism is suspended from the main axle of the machine, B the sickle and finger bars, and C the rod by which the cutter is reciprocated, Figs. 2 and 3 showing different views of the attachment, which has an upper diminished portion and a thicker lower portion, with a downwardly running oblong slot through it. The attachment is made fast to the outer side of the arm of the shoe by flat headed bolts, while the thicker portion of the attachment projects under the arm of the shoe and forms a shoulder or bearing for the shoe to rest in, this thicker portion also forming a broad or extended support for the axle of the leading wheel, said axle being adjusted within the slot shown in Fig. 2. When not required, this attachment may readily be detached.

WHITE'S ATTACHMENT FOR MOWING MACHINES.

AN IMPROVED BOILER FOR STEAM HEATERS.

A novel construction of boiler for steam heating apparatus, by which all danger of burning out or overheating the feed chute is avoided, is shown in the accompanying illustration, and forms the subject of a patent recently issued to Mr. William C. Bronson, of Saratoga Springs, N. Y.

The arrangement of the three circular water chambers around and above the grate, and the manner in which they are connected and a good circulation



BRONSON'S BOILER FOR STEAM HEATERS.

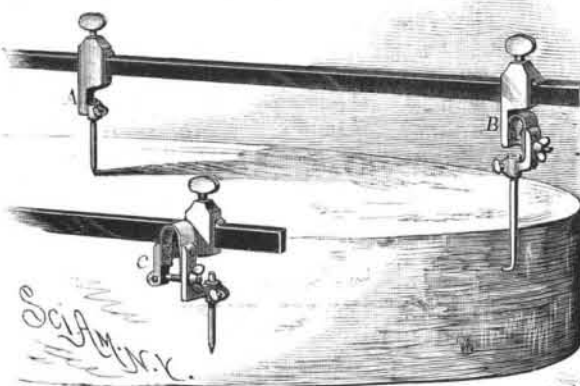
effected, by the various upright pipes leading to the dome of the heater, is well shown in the picture. The feed chute, which has an outer opening just below the dome, leads thence inwardly and downwardly over the grate, the fuel ordinarily partly filling it, but its walls are surrounded by a water jacket, the interior of which is also in communication with the other water spaces and with the dome. It is intended that this boiler, when provided with automatic regulating attachments, will run perfectly well for twenty-four hours without attention.

Conversion of Heat into Electricity.

Messrs. Hurghausen & Nerust have devised a most curious experiment from the scientific point of view. A thin metallic leaf is placed in a magnetic field. If its extremities are maintained at uneven temperatures, they have discovered that a difference of potential is manifested by these portions—extremely slight, it is true, but quite appreciable. Moreover, the direction of the current varies with the lines of force of the magnetic field. They used a piece of bismuth, 5 centimeters (2 in.) square and 2 millimeters (1-12 in.) thick, which they placed in a field of 5,000 units. The difference of temperature was secured by placing two pieces of mica in contact with the ends of the piece, one of which was immersed in cold water and the other heated by an alcohol lamp. Under these conditions they have obtained a difference of potential of 0.00125 volt.—*L'Electricite.*

AN IMPROVED ADJUSTABLE TRAMMEL.

The use of a trammel or beam compass, such as the one herewith shown, for accurate gauge measurements or for describing circles is much facilitated if the device possesses means of a ready and exact adjustment, and these are points which form the principal feature of a patent recently issued to Mr. Alban Heiron, of San Leandro, Cal., our illustration showing the device as adjusted for use in connection with a circular body, as a grindstone. The two slides are mounted upon the beam with spring blocks and set screws, slide A carrying a downwardly extending arm with a split socket, which may be provided with a point, as shown in the picture, or with a pencil or bent caliper point. The downwardly extending arm of slide B carries one leg of a U-spring, a socket being secured to the other leg of the spring, the arm of the slide being made to extend from one side, if desired, as shown in the figure marked C, in which case the point socket may be



HEIRON'S TRAMMEL OR BEAM COMPASS.

brought beneath the beam, and the connection shortened up between the beam and the point supported thereon, while still allowing room for the spring connection. A screw is pivotally connected to the downwardly extending arm, as shown in slide C, passing through an aperture in the oppositely connected spring arm, and having a winged nut, by turning which, after an approximate adjustment has been obtained by adjusting the slide upon the beam, an exact adjustment of the points may be quickly and readily secured.

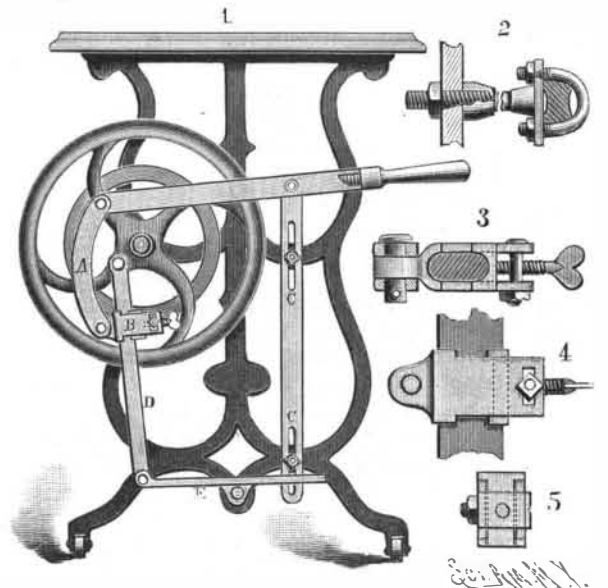
Emission of Ammonia by Vegetable Mould.

The authors' results apply essentially to the cultivated clay soils of the neighborhood of Paris. This soil emits spontaneously ammonia by reason of the slow decomposition of the amidic and ammoniacal compounds which it contains. This decomposition is effected at once under the influence of purely chemical actions due to water and earthy carbonates, and doubtless also under the influences of purely physiological actions due to fermentation, to microbia, and to vegetation properly speaking.—*MM. Berthelot and Andre.*

DEVICE FOR OPERATING SEWING MACHINES BY HAND.

The invention herewith illustrated shows a hand attachment for operating sewing machines, which has been patented by Mrs. Lois Waite McClung, of Pueblo, Col., and in which the connecting devices are so formed that the improvement may be readily applied to machines of almost any size. In Fig. 1, D and E represent the ordinary form of pitman and foot treadle, as connected with the driving and balance wheels; B shows a novel form of clamp attached to the pitman, the details of this clamp being fully given in Figs. 3, 4, and 5. A is a link pivotally attached at one end to the clamp upon the pitman, and its other end to a lever which has an operating handle, and is pivotally mounted upon an upright bar connected to the machine frame by clamping attachments, C C, shown in detail in Fig. 2. It will be readily understood that the pitman clamp is so made as to take in and firmly clamp different sizes of pitman, having U-shaped arms, in which works a follower that is moved forward and forced against the pitman by a thumbscrew. The frame clamping attachment holding the upright bar,

upon which the operating lever is pivoted, consists of a T-shaped bolt, its outer end threaded to be engaged by nuts to fix the upright bar, through the slots therein, at the desired height, and its head flanged and double-apertured to receive the threaded arms of a U-bolt, by which a firm clamp is made upon the frame of the machine. The handle of the operating lever can be readily removed when it is not desired to operate the



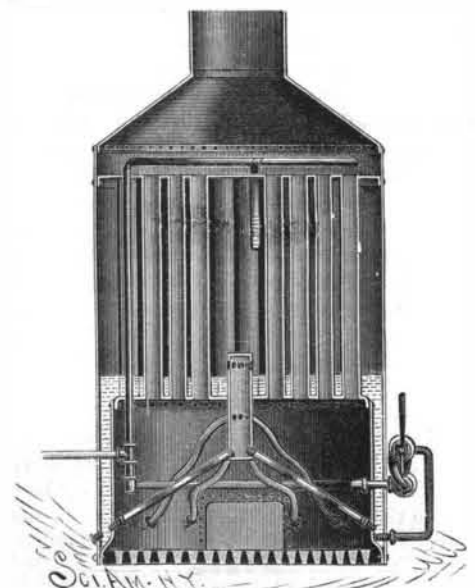
McCLUNG'S DEVICE FOR OPERATING SEWING MACHINES.

machine in this way, and the treadle only is to be used.

For further information address the patentee, or Mr. J. S. McClung, Pueblo, Col.

A QUICK STEAM MAKING BOILER FOR FIRE ENGINES.

It is obvious that the boiler herewith illustrated possesses great heating power for the comparatively small quantity of water with which it is operated. The fire box is surrounded by a water space, from near the lower portion of which, pipes, bent in somewhat serpentine shape to expose more surface, extend upward through the open space of the fire box to a central large tube fitted in the lower tube plate, and having several discharge openings above the tube plate. In operation this causes a constant flow of water from the bottom of the water leg, through the pipes in the fire box, to the main water space above the tube plate. The feed water enters through the pipe shown at the left in the picture, thence passes upward at one side and through a pipe coiled above the upper tube plate, to be discharged from a rose in the main water space. To the lower end of the feed water pipe is connected a pipe that is carried around the inside of the fire box, there communicating with a pump, shown at the right in the picture. When this pump is operated, which generally need be only for quickly circulating the cold water when the fire is started, water is taken thereby from the lowest part of the water leg, passed half way around the inside of the fire box, and thence through the feed water pipe and its coil above the tube plate to the place of discharge in the boiler.



BIRGE'S STEAM BOILER.

This boiler, which has been recently patented by Mr. Elias B. Birge, of St. Paul, Minn., is especially designed for steam fire engines, although it may be likewise used for locomotives and all classes of portable engines. In a steel boiler which the inventor has had made, it is stated that steam was raised to a pressure of 25 pounds from cold water, and without the use of the auxiliary pump, in 4 minutes and 22 seconds, there being no foaming or priming in testing and working, and there being no leaks from expansion and contraction.