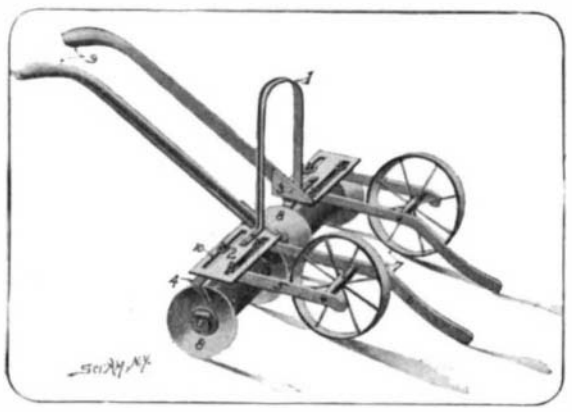
Patent Department

ADJUSTABLE CULTIVATOR.

A patent has recently been granted to Mr. Arthur A. Thogersen, of Brookings, South Dakota, for an improved cultivator of a type used in gardens and nurseries for the cultivation and weeding of small plants. The improvement lies in the provision of means for adjusting the cultivator disks relative to the main frame, or to the rows of plants, so that the soil may be thrown toward or away from them, as occasion may require. The ground wheels and beams

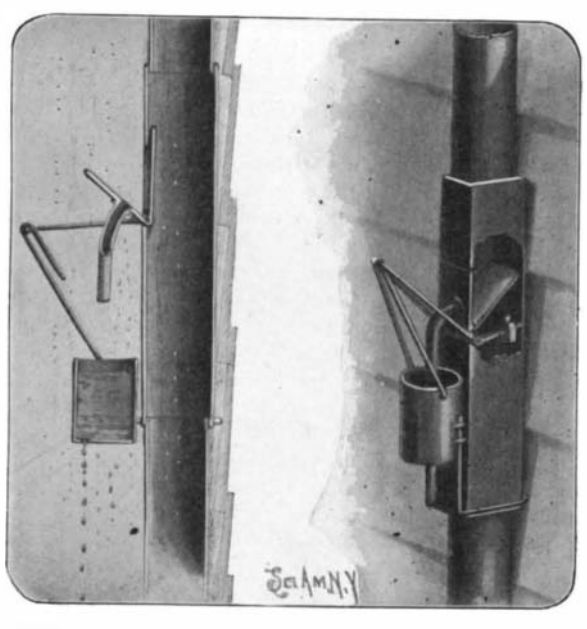


ADJUSTABLE CULTIVATOR.

may also be shifted laterally to a sufficient degree to permit passage of large plants or bushes. The construction of the cultivator will be readily understood by a glance at the accompanying illustration. The frame comprises the usual arch 1, which connects the angle plates 2, and the handles 9, secured to the vertical portions 3 of the plates. The plates are provided with lateral slots 10, through which the pivot bolts of the bearing sleeves for the cultivator disks 8 project. The bars or beams 5 and 6, supporting the ground wheels 7, are similarly secured to the frame by bolts projecting through slots in the plates. Now, according as the rows of plants to be cultivated are close together or far apart, by loosening the nuts on the pivot bolts, the pairs of disks may be shifted to a corresponding distance from each other. By swinging the bearing sleeves about on their pivots, the amount of soil broken up by the disks, and the direction in which it is thrown, may be governed at will. The scrapers 4, which swing with the bearing sleeves, serve to remove any soil that may collect on the disks. It will be observed that the beams 6 are extended and curved downward to the ground. These serve to stir up the soil adjacent to the rows of plants, thus rendering them more susceptible to the disintegrating action of the disks.

USEFUL ATTACHMENT FOR RAIN-WATER LEADERS.

In many localities rain-water when pure is preferably used for drinking purposes, being collected from the roofs of houses and kept in cisterns. One serious objection to rain-water thus collected lies in the fact that during dry weather impurities of many sorts gather upon the roof, and these when washed into the cisterns, often contaminate the water thus collected, and render it unfit for use in cooking or on the table. Mr. John Keller, of Ottoville, Putnam County, Ohio, overcomes this objection in the following manner. Located at any desired point on the rain-pipe is a box-like section containing in its front



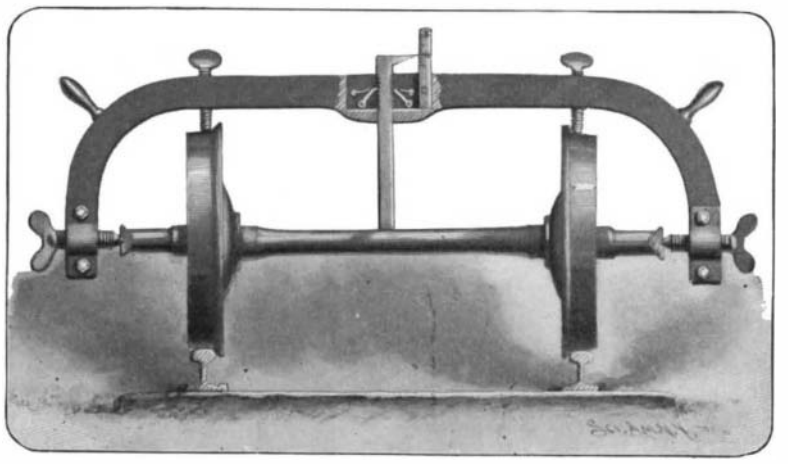
USEFUL ATTACHMENT FOR RAIN-WATER LEADERS.

wall an opening closed by a two-part gate valve. This valve consists of two gates joined at the bottom, preferably at an angle of 45 degrees. The valve is rigidly secured to a shaft which has bearings in the sides of the box section. To the projecting ends of this shaft, the ends of a U-shaped rocker arm are secured, and from this rocker arm a water pail is hung, being adapted to slide between guide bars on the box section. Normally the parts assume the position shown at the right in our engraving, being thus held by a weight on an extension of the rocker arm. In this position it will be observed that the inner gate closes the passage through the box section, while the outer gate closes the opening in the front wall. The only outlet for the rain-water therefore is through a spout in the outer gate and thence into the water pail. The water will continue to flow into the pail until the increased weight of the latter overbalances that of the weight on the rocker arm, when the pail will drop, and the gates swing out to the position shown in our sectional view. By this time the impurities on the roof will have been washed off, and the pure water will flow down through the rain-pipe into the cistern. By adjusting the weight on the rocker arm, the amount of water allowed for washing off the roof may be varied at will. The water pail is provided with an opening at the bottom, through which this impure water may escape; the opening may be normally closed, or if it be exceedingly small, so that it would require several hours for the pail to empty, the opening may remain open continuously.

HEATER ATTACHMENT FOR LAMPS AND GAS BURNERS.

The problem involved in the effort to utilize the waste heat of a lamp or a gas jet, for the purpose of warming a room is no small one. The natural tendency of heated air, on account of its expansion, is to travel upward; consequently, the lower parts of a room may be very cool while the ceiling is lined with a layer of hot air. Some systems make use of mechanical means for casting the heat down where it is needed, but obviously, such mechanisms could not be economically applied to a small heater adapted to be used on a kerosene lamp, a gas jet or the like. However, a very simple solution of the difficulty has been found. Heretofore inventors have apparently been experimenting with heat only as carried by a draft of air. Heat may be easily absorbed by an air current and again radiated out at some other place, but this is evidently an indirect method of distribution; for like light, heat is a vibration of the ether and may therefore be transmitted without the aid of any other medium. The heating of any material substance is merely the gradual communication of this vibration to the particles of the substance. With this brief review of high-school physics, we can readily see that the rays of heat may be made to travel in any desired direction, regardless of air currents; that the heat rays of a lamp may be reflected down to the floor in exactly the same way as light rays can.

A simple device used to accomplish this result is pictured in the accompanying illustration. It consists of a parabolic reflector surrounded by a drum and supported on a bracket. Two forms of bracket are provided—one adapted to be attached to a gas burner, Fig. 3; and the other applicable to a lamp chimney, as shown best in Fig. 1. The heat rays on striking the walls of the parabolic reflector are cast downward in parallel beams. In the case of the lamp bracket, a buffer plate lies under the draft opening in the top of the reflector. This is necessary because most of the heat passes up the chimney and must be spread out to come in contact with the reflecting wall. The drum serves to assist in the circulation and to prevent the reflector from injury under the intense heat. Part of the heat is of course taken up by the air and the products of combustion, and passes up through the draft opening; but a large percentage is reflected down despite the strong upward air current. This may be demonstrated by the use of a lighted cigar, the smoke of which will be seen to pour into the reflector and out through the draft opening, while in the meantime, heat can be strongly felt at a considerable distance below the reflector. This heat is of course free from those objectionable gases resulting from combustion, and is consequently more healthful than the air which passes up to the ceiling. It also sets up a general circulation in the air with which it comes into contact, and these currents do not pass through the flame to be robbed of oxygen. It is claimed that this device will heat a room ten by twelve feet to 76 deg. when the thermometer outside is at zero, and that in such weather the capacity of each heater on an ordinary gas jet is about 12 deg. an hour; this necessarily increases or decreases according to the temperature outside. The device offers the further advantage of utilizing the heat without any reduction in the light-giving power, for even on a gas jet the heater is supported with the bottom on a level with the tip of the burner, and the parabolic reflector, particularly if kept bright, throws down a concentrated light on the work below, which means that at night, when a light is necessary, the heating of a small room is done at no cost whatever. The heater is made by the Giant Heater Company, of 68 Monmouth Street, Springfield, Mass.



GAGE FOR RAILWAY CAR AXLES.

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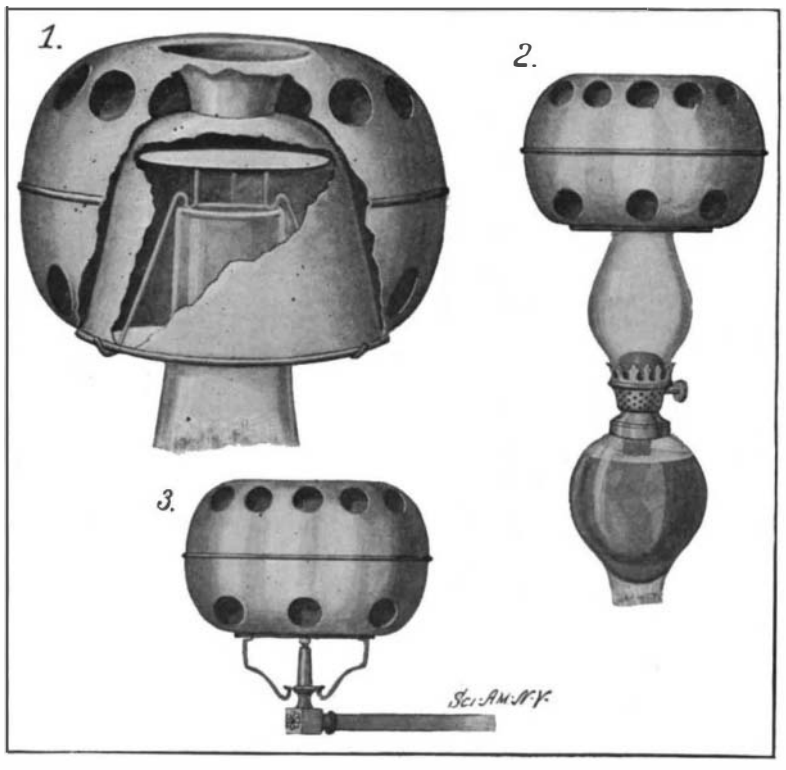
In railway shops where the rolling stock is brought in for repairs after accidents or long usage, it is very convenient to have a gage which will, at a single measurement, detect any misplacement of car-wheels on the axles, and any flattening of their treads, and also any bend in the axle itself. Such a gage, in improved form, has been invented by Messrs. F. J. Compliment and J. O. Robinson, of Ironton, Ohio. The construction of the gage is shown in the accompanying illustration. It comprises a frame or yoke adapted to span the car wheels and axle and having, in its downwardly-turned ends, screws adapted to engage the lathe-centers of the car-axle. Movable vertically through the center of the yoke is a gage-bar designed to indicate the trueness of the axle. At the upper end of this gage-bar is a pointer movable along a graduated plate. Ratchet-teeth are formed on the bar below this pointer and are engaged by spring-pressed pawls. The yoke is further provided with gage-screws designed to engage upon the periphery of the wheels, to indicate whether or not they have slipped on the axle. In operation, the axle-gage is applied to the car wheels and axles in the manner illustrated, and then the wheels are moved over a floor or a track, and the frame is held in vertical position by means of the

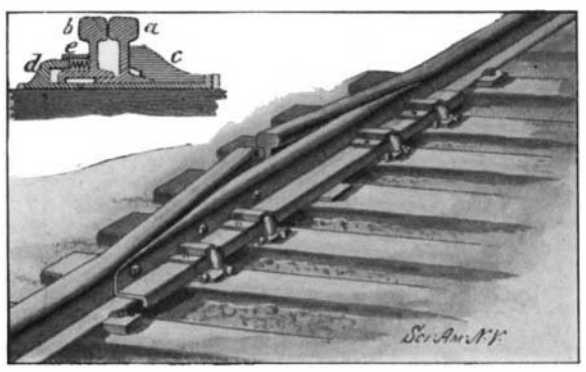


HEATER ATTACHMENT FOR LAMPS AND GAS BURNERS.

handles thereon. The central gage-rod resting on the surface of the axle will point to zero on the scale plate provided the axle is true. If, however, the axle be bent or sprung, the bar will be raised as the wheels rotate and the amount of deflection indicated on the scale plate. At the same time the gage-screws resting on the peripheries of the wheels should be watched to detect any flattening in the treads. Any misplacement of the car wheels on their axle will be immediately observed by noting their relation to these gage-screws.

RAIL CONNECTION.

The large number of patents on rail joints which are being issued each year indicates the importance of this part of a railway track, and also shows that the problem has not yet been satisfactorily solved. Mr. Alexis Hauptmann, of Beaumont, Tex., has attacked the problem from a new standpoint. Instead of providing devices for joining each rail to the next adjacent one, he proposes to weld together a large number of rails by electricity or any other suitable

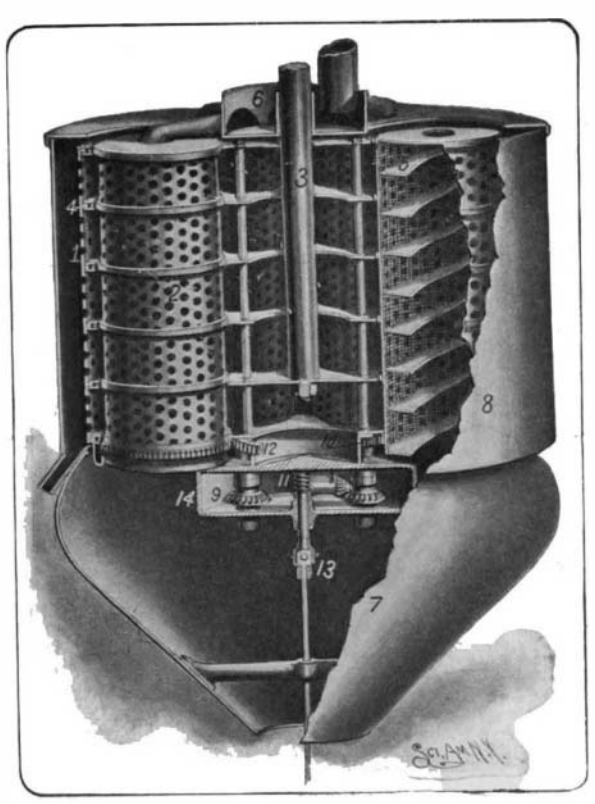


RAIL CONNECTION.

means, and then to join these long sections with a connection which allows for expansion and contraction. Moreover, the connection provided is of such a nature as to cause no break in the track, thus doing away with the objectionable pounding of car wheels in passing over the usual rail joints. The connection used is shown in our illustration. It will be observed that the track sections to be joined are bent outward at their ends and are connected by a rail which is tapered to fit these ends. This connecting rail is securely bolted to one of the track sections but has sliding connection with the other. This is necessary to allow for the extra large expansion and contraction of the track section due to the length of each section. A chair permitting this sliding connection is illustrated in our small detail view. Here the rail section *a* and the connecting rail *b* are supported on a bed plate. Formed on one end of this plate is a chair *c* engaging the rail section, and at the other end a stud *d* projecting into a casing *e* and pressing the spring held therein against the rail *b*. This holds the parts with all the necessary rigidity, but at the same time permits slight longitudinal movement of the track section. To further prevent interference with this sliding movement the bedplates for the track sections are recessed to admit the base flanges of the rails, and the spike holes are so placed that the shank of the spike does not touch the rail, but only the head engages the top of the flange.

CENTRIFUGAL SEPARATOR.

The new type of separator for sugars and other sub-



CENTRIFUGAL SEPARATOR.

stances which is illustrated herewith, offers the advantage of permitting the material to be continuously fed and distributed while the parts are rotating at high speed, thus obviating the necessity of stopping the machine to place the material therein, and saving the time and power incidental thereto. The machine provides for the thorough separation and isolation of the liquid from solid matters, and for forcing the latter positively down through the separator. It comprises a drum rotated at high speed, within which a number of treatment cylinders are mounted which have a slow rotary movement on their axes. In our illustration the drum may be seen in section at 1, revealing the treatment cylinders 2, mounted therein. The interior of the drum is provided with a number of plates or webs, two of which are secured to the shaft 3. The treatment cylinders are held loosely in openings in these webs, being supported by flanges at the top. Raceways 4 are formed along the edges of the web openings to receive rollers or balls, which bear against track-bands on the cylinders and serve to diminish the friction when the cylinders are in motion. The sheet-metal walls of the cylinders have a large number of perforations, through which the liquid is thrown by the centrifugal energy developed in the rapidly-rotating material, the solid matter being retained by the wire-screen lining of the cylinder. Each cylinder is provided with a feeder consisting of a broad strip of metal bent in the form of a helix, as shown at 5. In operation the drum is driven at a high rate of speed by any suitable motor acting on the shaft 3, and the material is fed into the cylinders by centrifugal action from a hopper 6. Owing to the high speed of rotation of the drum, the material in each cylinder will hug that part of the circumference which is furthest removed from the center, the liquid part passing out through the perforations. By a system of gearing the cylinders are made to rotate slowly on their axes, so that the spiral feeders force the solid material downward until it passes into the stationary receptacle 7. The liquid, in the meantime, is entirely drained out, and passing through perforations in the drum, is caught in a trough at the bottom of the stationary casing 8, whence it flows out through the discharge pipe. The gearing which provides for the independent rotation of the cylinders comprises the bevel gears 9 and spur gears 10, mounted to revolve with the drum 1. These gears are caused to rotate on their own axes by means of worm gears meshing with the stationary screw or worm 11. The gears 10 engage an independent gear ring 12, which meshes with the gear on the bottom of each cylinder. It is evident that by this system of differential gearing the cylinders are made to slowly rotate while revolving about the common axis of the drum. The universal joint 13 on a stationary shaft provides for any irregularity of rotation or oscillation of the gear casing 14, which is rigidly secured to the drum and yet has bearing on the stationary shaft of the worm. The inventors of this machine are Messrs. W. G. Hall and W. A. Ramsay, of Honolulu, Hawaii.

Brief Notes Concerning Inventions.

In the stockyards at Chicago, an electric goad has taken the place of a whip in urging the animals along through the various passages to their place of execution. This implement has been found to have many advantages, mainly in the fact that it is even more effective than the whip, and does not in any way affect the meat. The idea has been further improved upon in the invention of James A. Giles, of Elberton, Ga., a rural letter carrier, who has conceived the notion of using electricity to urge along his horse when attached to the carriage. The wagon made use of by Mr. Giles in the pursuit of his daily vocation must be entirely inclosed in order to protect the mail matter from the weather, and under the circumstances the use of a whip of the ordinary type is a very inconvenient matter. So the suggestion occurred to him to make use of an electric current as a substitute for the lash. His first experiments in this line were successful in the extreme, and he at once built a substantial device to be permanently made a part of his traveling outfit. Now, when he wants to stir his steed up a little, he merely gives a few turns to the handle of a small generator, and the effect on the animal is like magic. Mr. Giles is of the opinion that these occasional shocks of electricity are decidedly beneficial to the animal instead of doing injury to it. The shock is administered to the horse through the means of two plates inconspicuously placed under parts of the harness.

George C. Hale, the former chief of the Kansas City Fire Department and the inventor of the swinging harness, the water tower, and an automatic alarm, has just completed another invention which will add greatly to the glory he has achieved in this line, if it proves to be entirely satisfactory. His invention is an improvement on the automatic sprinkler, and does away with one bad feature of that device, and that is the great damage by water, which frequently takes place by the unnecessary flooding of a comparatively large area for the purpose of quenching a fire which may be confined to a few feet of floor space. It has frequently happened that where the fire has broken out and been extinguished without discovery, the sprinklers remain in action for hours afterward, and the water has done as much damage as a serious fire. In the apparatus designed by ex-Chief Hale, he combines some of the features of the sprinkler system with that of the Babcock tank extinguisher. The pipes, instead of being filled with water, contain air under pressure. The unusual heat causes the breaking of a seal, as in the case of the sprinklers, and this release of air automatically performs the operations of generating the gas, which thereupon issues from the pipes and extinguishes the fire by smothering it. There is a small amount of water in the tank, which is necessary to create the pressure of gas which is necessary, and some of this issues through the pipes, but it cannot under any circumstances be enough to cause any great damage. This system has been perfected and subjected to public trials, which are said to have proven entirely satisfactory. Application for a patent is pending.

The report of the Commissioner of Patents for the past fiscal year shows that the number of applications was greater than ever before, having exceeded the 50,000 mark. The total number of patents granted was 27,387, including reissues and designs, 1,864 trade-marks, 750 labels, and 163 prints. The number of expiring patents, 20,335, and the number of allowed applications which were forfeited by reason of the non-payment of the final fees was 4,123. The total receipts of the office were $1,491,538.85, and the total expenditures were $1,329,924.63, the surplus of the receipts over the expenditures being $161,614.63. In his report the Commissioner notes a very gratifying decrease in the number of complaints of losses of money in the office. From September 1, 1900, to June 30, 1901, the amount of losses aggregated $686.13, while for the corresponding ten months of the past year the amount had been decreased to $9.35, and the Commissioner states that all of this can be charged to losses in the mail, and to claims erroneously made. The Commissioner urged the appropriation of a larger sum for the purchase of reference books for the library. The amount heretofore available for the purpose has been $2,000, and a large part of that has been necessarily spent in sending the publications of the office to the offices of foreign countries. The Commissioner is of the opinion that the amount appropriated for this purpose should be doubled.

Propeller blades of cast iron are in general use, on account of the great cost of those of bronze. The life of a cast-iron blade is very uncertain, owing to the two facts that they are very easily broken and also that they are particularly subject to corrosion. Corrosive action invariably attacks what is known as the "tip" of the blade, which is not the point particularly, but covers an area from twelve to eighteen inches from the point. It is a comparatively simple and inexpensive matter to replace the blade which has become broken or worn by corrosion, but the operation is one which requires several days' work, and it is this delay which is a serious matter to the ship's master. A process has been recently devised and patented by Charles Fleming, of Sydney, New South Wales, by which the damaged portion of the blade can be replaced in a few hours with either cast iron or bronze and at a trifling expense. The corroded or damaged portion is broken away, and the remaining part is bedded in the foundry floor, and a cope rammed up over the part which is to be renewed. The mold is then parted, finished, dried, closed, and cast with the desired metal, and it is here that the novelty of the process enters into the operation. The joint is then burned, care being taken that the metal from the ladle falls on the cast portion of the blade if the new part be of bronze. This mend is said to be thoroughly serviceable.

A machine for making railroad ties, which is regarded as a remarkable innovation, has been on exhibition recently in New Orleans, La. It is the invention of Constantine Hege, a lumberman hailing from Salem, North Carolina. A company has been formed to exploit the patent. The president of this corporation is Thomas Gibbon, vice-president of the San Pedro, Salt Lake & Los Angeles Railroad. By human labor, not more than ten or a dozen ties can be made per day per man, but by the aid of this machine it is claimed that four hundred ties can be made in the same time. These, too, are much more regularly formed than those made by the laboring man with his broadax. The machine is constructed somewhat on the principle of the lathe, augmented with a long steel roller set with about thirty blades, regulated with a system of projecting necks, so that they can cut only to the depth of a sixteenth of an inch at each stroke. The log passes back and forth a few times, and is trimmed down to the desired size and shape.