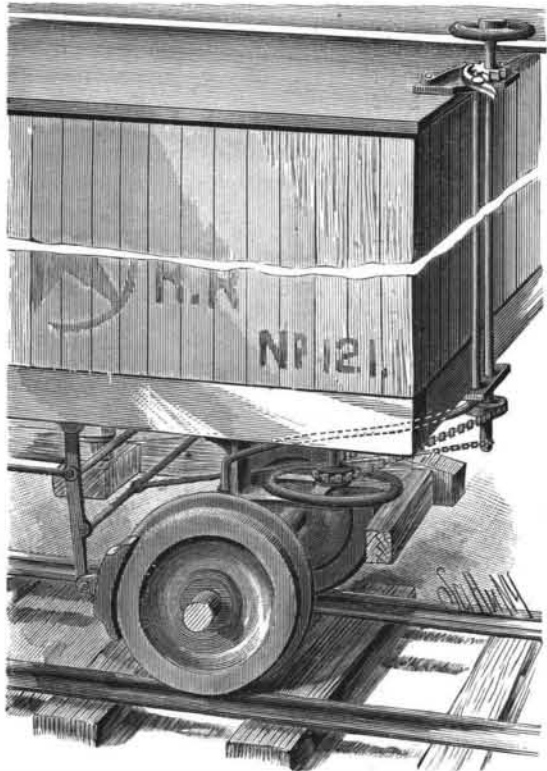


CAR BRAKE ATTACHMENT.

In this attachment the body of the car is, as usual, provided with a brake shaft having an upper hand wheel. The lower end of the shaft is connected to the brake lever by a rod and chain. Upon the shaft is placed a sprocket wheel, with which engages a chain passing around a second wheel carried by a shaft mounted in a bracket secured to the bottom of the car. This second shaft carries a large hand wheel, by turn-



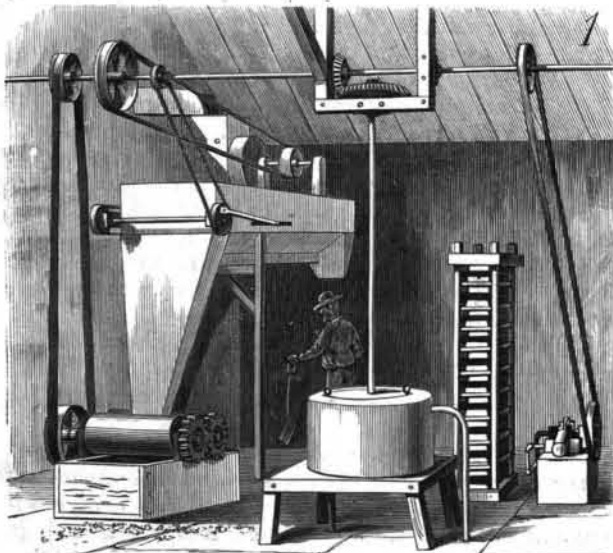
QUATERMASS' CAR BRAKE ATTACHMENT.

ing which the brake shaft may be turned and the brakes applied. The top of the brake shaft carries the usual ratchet wheel, engaged by a pawl forced into engagement with the wheel by a spring. The pawl is carried by a vertical rod, to the lower end of which is secured an outwardly extending lever arm, the arrangement being such that by throwing the lever forward (toward the right in the engraving), the pawl will be moved from engagement with the ratchet wheel, thus releasing the brake shaft and throwing off the brakes. In one modification of this construction the lower hand wheel is dispensed with, its place being supplied by a ratchet lever, the reciprocating movement of which imparts a rotary motion to the short shaft carrying a sprocket wheel of the chain. In another modification the sprocket wheels and chain are replaced by a train of gearing. It is evident that, by means of this attachment, the brakes may be applied or released from either the roof of the car or from the ground.

This invention has been patented by Mr. Reuben Quatermass, of Moline, Kansas.

APPARATUS FOR EXTRACTING OIL FROM SEEDS.

The apparatus here illustrated is designed for extracting the oil from cotton and other oil-bearing seeds. The seeds are led from a gin, by a conveyer, into the hopper of a huller, where the hulls are separated from the kernels, the former being allowed to escape through a chute to the outside of the building, while the latter pass by another chute directly into a crusher. The huller is provided with two metal burrs having slots in their faces to receive sharp knives; one of the burrs remains stationary while the other rotates. A sheet iron casing inclosing the burrs is provided with a spout, which conveys the hulled seed into a screen box or separator which has two sieves, rigidly connected together, and suspended within the box in such a manner as to receive a reciprocating motion. The



BAUMGARTEN'S APPARATUS FOR EXTRACTING OIL FROM SEEDS.

sieves have opposite inclinations, the upper one discharging the kernels upon the lower one, from which they pass into a conveyer in the bottom of the separator, which leads them to the crusher. The next stage in the process is performed by the crusher, which is simply a strong iron frame carrying two geared and adjustable chilled rollers. From the crusher the kernels are conveyed to a heater, in which they are reduced to what may be termed "a condition of cooked meal." This meal is then wrapped in cloth in properly shaped packages to enter the hydraulic press, which is shown in vertical section in Fig. 2.

Water is supplied to the cylinder, within which is a hollow ram, through a pipe leading from a suitable pump. Extending upward from the top of the cylinder are guide rods, shown in the cross sectional view, Fig. 3, up and down which the pressing plates move. These plates, which are shown in section in Fig. 5, and the lower one of which is attached to the plunger, are built up in sets of two or more, the several plates in each set being loosely connected by bolts with each other, so that the lower plates of each set are suspended from the upper ones and are free to move upward, when pressure is applied, independently of each other, but are kept at their proper distances apart for charging with the meal when the ram is down. Each plate is cast in a single piece, then planed smooth, and grooved to allow the oil to escape. The upper faces of the plates are constructed with raised ribs at the inner ends and for a portion of the sides of the grooves; within the space thus formed is placed a screen, Fig. 4, of closely woven wire cloth, which allows the free passage of the oil to the grooves without exposing them to being choked by the material being compressed. From the above brief description it will be seen that this apparatus is very simple and compact, and that it is well adapted to the work required.

These inventions have been patented by Mr. Christian Baumgarten, of Schulenburg, Texas.

Causes of Boiler Explosions.

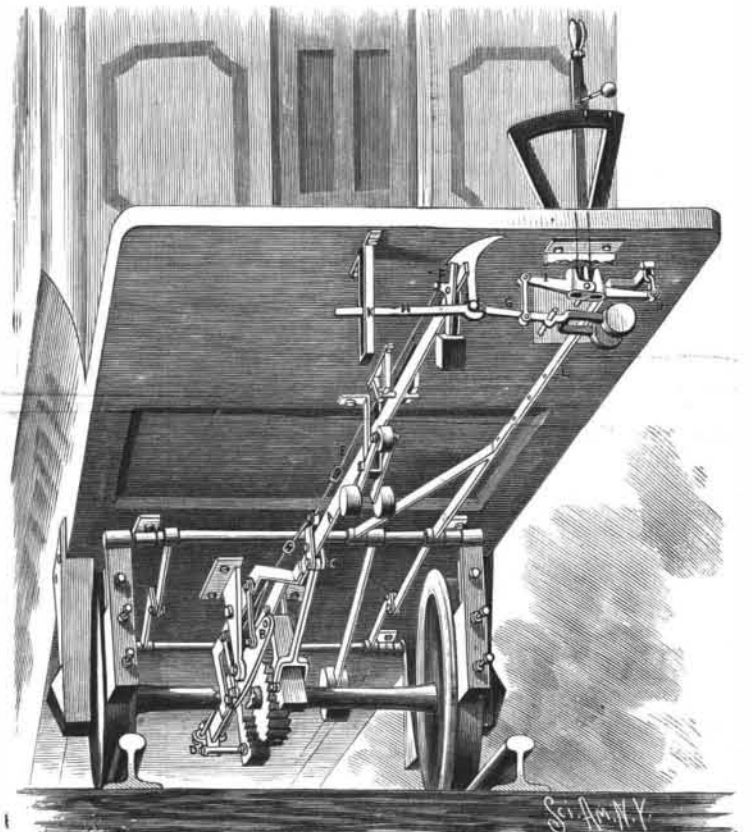
The *Ingenieur-Conseil*, of Brussels, has recently published a paper by Mr. Hochereau, formerly an artillery officer and director of the Haine-St. Pierre Works, upon the causes of the fulminating explosions of steam boilers, which are nearly always accompanied with, or preceded by, one or more violent detonations. Mr. Hochereau thinks that such explosions should be attributed principally, if not exclusively, to the inflammation, through an electric spark, of a mixture of air and pure or more or less carbureted hydrogen gas produced in the boilers. After citing numerous facts and calculating the expansive power of a mixture of air and pure or carbureted hydrogen, he concludes as follows:

1. In boilers that have exploded, there exists a mixture of air and more or less carbureted hydrogen.
2. Boilers fed with water containing organic matter, especially fatty substances, have been most frequently the ones subject to explosion.
3. Organic substances—animal or vegetable—are sources of an abundance of hydrogen, which is derived from their decomposition, probably when, contained in an insoluble soap, they are highly heated. A sloping deposit may be a proof of the presence of such substances; it may be formed in the water at any depth; and it does not indicate that the water has lowered to that point.
4. The electric spark which is produced through the friction of globular steam in narrow passages is the firebrand that lights these mixtures of expansive gasses. The result is that the dangerous moment is that in which the engine is started. Engineer Parkes has observed that out of 24 marine boilers, 19 exploded at the moment of starting up, and 4 when the piston had reached the end of its stroke. But the explosion may occur when the engine is not running, since the gas, having filled a space, such as that in the dome, may, by flowing into the upper part of the boiler, reach an imperfect joint where an electric spark is produced.
5. The live expansive power of these inflamed gasses is very great, and depends upon the pro-

portions of the mixture. The accident may likewise occur without detonation. Thus, the inflamed gas, making its way between the valve chests and between the domes, is mixed with steam in such a proportion that it does not detonate, but acts like a burning quickmatch. 6. The lowering of the manometric pressure before the explosion is a consequence of the presence of the gas, and denotes danger.—*Chronique Industrielle*.

CAR STARTER AND BRAKE.

The main objects of this invention, which has been patented by Messrs. Thomas Cox and Thomas Cox, Jr., of Gloster, Montana, are to entirely dispense with the use of springs, and to so arrange the parts that the starting mechanism may be employed from time to time in quick succession, should the load upon the car be excessively heavy. Upon the axle is keyed a toothed wheel, and just above the axle is secured a downwardly extending bracket, which serves as a pivotal support for the main operating lever, A, and for a beam lever, B. These levers are connected by links arranged as closely as possible upon either side of the fulcrum of the beam lever, to each end of which is pivoted a clutch. One clutch is connected by a link with the rocker, C, carried by the lever, A, while the other clutch is connected with a sliding block, D, mounted upon the rear end of the lever, A. A connecting rod, E, extends from the upper end of the rocker, C, forward to a bell crank lever, F, pivotally attached to the forward end of the lever, A, the rod being connected to the vertical arm, the other arm extending forward in a plane just above that occupied by the forward end of the lever, A, and being provided with a weight.

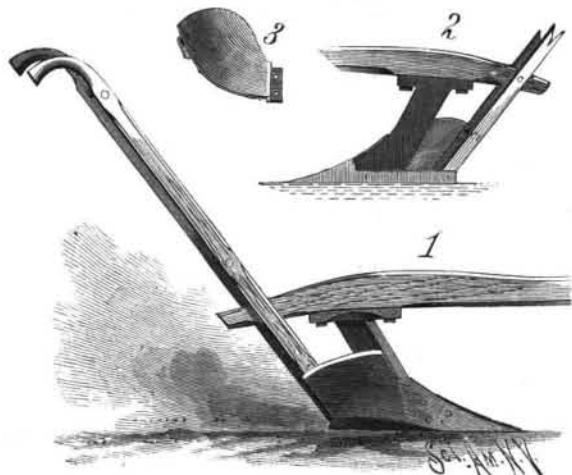


COX'S CAR STARTER AND BRAKE.

These parts project outward through a vertical guideway formed by a bracket secured to the platform, the points of the two levers being in the path of a latch piece pivoted to the end of a lever, G, pivoted in a frame. The latch is formed with a heavy arm, H, which is guided in a vertical way formed in a bracket, K. The upper face of the latch is curved, and upon its lower end is a stop which bears against the under edge of the lever, G, which carries a weight. A shaft mounted in a frame carries two arms, I, J, the ends of which are forked and formed with holes, through which the shaft passes. The forked ends of the levers are formed with shoulders, against which a lever mounted upon the same shaft may be brought to bear. The ends of the levers, I and G, are connected by a link. The normal position of the parts is shown in the engraving. When the operating lever is thrown to the left, the lever, I, will move to carry down the unweighted end of the lever, G. This motion will rock the bell crank lever, and thereby advance the rod, E, when the clutches will be thrown into engagement with the toothed wheel. As the motion of the main lever is continued, the rod, A, will be carried downward to rock the beam, B, and start the wheel forward, as will be understood. The extending end, H, of the latch then strikes the lower edge of the slot in the bracket, K, so that any continued movement of the main lever will cause the latch to free itself from the levers, which will be returned by the action of a pair of weighted arms, mounted in a bracket attached to the bottom of the car. These arms carry a roller, which bears against the under side of the lever, A. When the operating lever

has been returned to a vertical position, the weights on the levers, G and H, will reset the parts, so that, by again moving the lever, an additional force may be applied to turn the wheels.

The braking mechanism consists of a rock shaft having arms carrying brake shoes. Rigidly connected to the shaft is a forwardly extending arm, L, which is coupled to the end of the lever, J. As the main lever is thrown to the right, the forward end of the arm, L, will be depressed, and the shaft rocked to carry the shoes against the wheels. The same mechanism operates brakes bearing against the rear face of the wheels.



NEVILLE'S COMBINATION PLOW.

Upon the main lever being returned, a weight carries the parts to their normal position. Further information concerning this patent, which is for sale, may be had by addressing the inventors, as above.

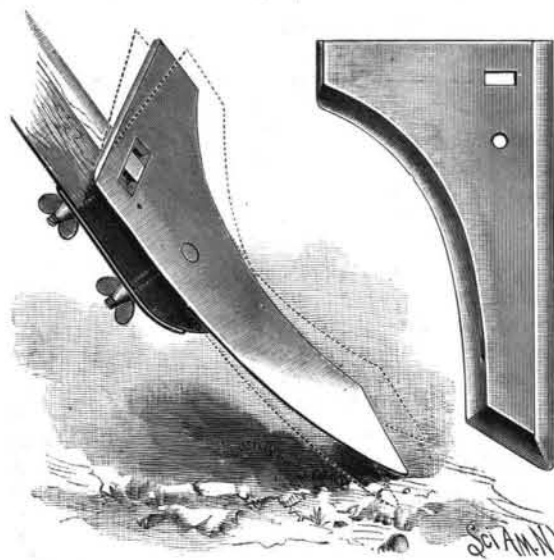
COMBINATION PLOW.

Upon the plow here illustrated either wooden or metallic mouldboards may be used interchangeably. The iron standard is bolted to the under side of the beam, there being a plate upon the upper end of the standard through which bolts pass. The standard projects downward and forward, and is provided with a flange, upon which rests the point, which is secured by a bolt and steadied by a rearwardly extending bar fitting in a recess in the standard, as shown in Fig. 2. Just back of the point is arranged a share, secured to the standard by bolts, and which projects upward beyond the flange upon the standard. The mouldboard, Fig. 3, has a flange fitting beneath the rear edge of the share, the extreme upper edge of the share abutting against a shoulder on the board. The handles of the plow are united by braces, one being beneath the beam; the landside handle is bolted to the rear end of the beam and to the rear end of the bar that steadies the point, while the lower end of the other handle is bolted to the mouldboard when the latter is made of wood. When the mouldboard is of metal, the lower end of the handle is stepped in a socket secured to the rear face of the board. Although a wooden mouldboard pulverizes the earth more thoroughly than one of metal, it is not always desirable to use the former, hence the need of a plow having interchangeable mouldboards.

This invention has been patented by Mr. S. S. Neville, of Burnsville, Miss.

CULTIVATOR TONGUE AND SHOVEL.

The engraving illustrates an invention which consists in a cultivator shovel, forming a combined tongue and shovel, capable of being adjusted laterally from a fixed



SANDERS' CULTIVATOR TONGUE AND SHOVEL.

center or pivot. The lower part of the blade, which is shown detached in the right hand view, forms the tongue part, while the upper portion forms the shovel. The straight vertical edge is beveled on its under surface to form a cutting edge, which adapts the blade to first plowing. The lower angular end is also beveled to form a cutting edge, and serves to work the earth

closer to the plant. The end being made slanting, a forcing action is exerted toward or from the plant. The outer edge is straight below, but spreads out laterally and upwardly in a curve, and is also beveled. This construction provides for the surface of the ground being cultivated without disturbing the roots of the plant. Above the curved portion the edge of the blade is rounded, the object being to prevent injury to the plant. The blade is secured to a standard by screw bolts arranged one above the other. One of these bolts rests in a countersunk seat formed in the sides of an oblong slot running in the direction of the width of the plate, to provide for the lateral adjustment of the latter from a fixed center formed by the other bolt. This adjustment of the blade, shown by the dotted lines, enables the operator to plow either close to the plant or away from it.

The blade may be used either with its straight side next the plant, as when the plant is small and requires the earth stirred close to it, but does not require the earth to be thrown toward it; or the shovel may be turned so that its curved edge will be presented to the plant, when the roots will be left undisturbed and the earth thrown toward it. The sharp cutting edges permit the shovel to be readily shifted while in the ground, and hence it can be more easily managed than if the edges were square and blunt.

This invention has been patented by Mr. James M. Sanders, of Morrisville, Ohio.

COMBINATION TOOL WRENCH.

This tool may be used as a hand and pipe wrench, wire cutter, wire nipper, screw driver, tack drawer, measuring rule, and for other purposes. The flat circular ends of the arms are connected by a rivet. On opposite sides of the rivet the circular ends are formed with notches, the outer pair of which form wire cutting edges, while the corners of the metal at the side of the other pair are rounded, to enable the arms to grasp wire for the purpose of stretching it without danger of cutting it. One arm is curved near its free end toward the other arm, and its extremity



SPARHAWK'S COMBINATION TOOL WRENCH.

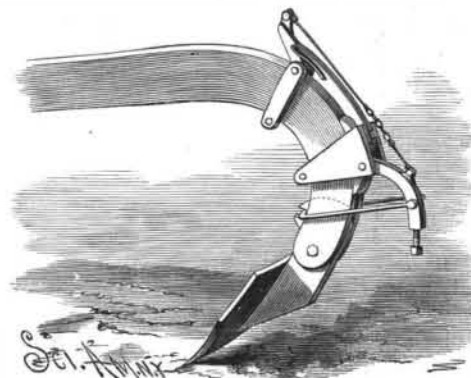
is provided with a chisel-edged angle hook, which is inclined toward the pivot. The other arm is thickened near its free extremity, curved outward and formed with sharp edged teeth inclined outwardly, and upon its extreme end is formed a screw driver edge. The inner faces of the arms are graduated into inches and fractions thereof, so that the device may be employed as a measuring rule. The hooked end is used for drawing nails and tacks and for engaging one side of a piece of pipe or a nut while being turned, the opposite side of the nut being engaged by one or more of the teeth on the end of the other arm. The screw driver is applied to a screw in the usual way, and the other arm may be employed as a lever for turning the screw. The arms fold compactly together, the screw driver edge coming directly opposite the edge of the hook. The outer corners of the arms are rounded, to permit of using the tool without injury to the hands, and also to prevent them wearing the pocket.

This invention has been patented by Mr. W. W. Sparhawk. Further particulars can be had from Mr. J. M. Marsh, of Scotia, Neb.

CULTIVATOR BEAM AND POINT.

The point shank is pivoted to the beam by a bolt. Attached to the beam is a spring, so arranged that it exerts a constant backward pressure upon the shank above its pivot. The spring thus holds the shank and point to their work until the pressure on the point overcomes the tension of the spring, when the point and point shank will spring backward and thereby lessen the pressure upon them. The lower end of the spring is attached to a yoke secured to the beam, and its upper end is held in a socket formed in a lever fulcrumed to a yoke on the beam, and is connected by a rod to a bent arm pivoted to the lower yoke. This arm is connected to the point shank by a coupling held in place by two lugs formed at the front edge of the

shank above the point. In case the pressure upon the point is more than equal to the tension of the spring, the point will move backward, the shank moving forward. This movement will draw the bent arm forward and the upper end of the lever downward, and thereby increase the tension of the spring which, upon the removal of the pressure, will return the parts to their original position. In case of over-pressure, the bent arm will strike the back of the shank, and thus lock the lever and shank, so that no injury can be done the spring. The distance the arm moves is regulated by a set screw in its lower end. Should the point enter the ground too deeply or strike an obstruction, the shank will yield, so that the point will automatically run more shallow in the ground, or pass the obstruction



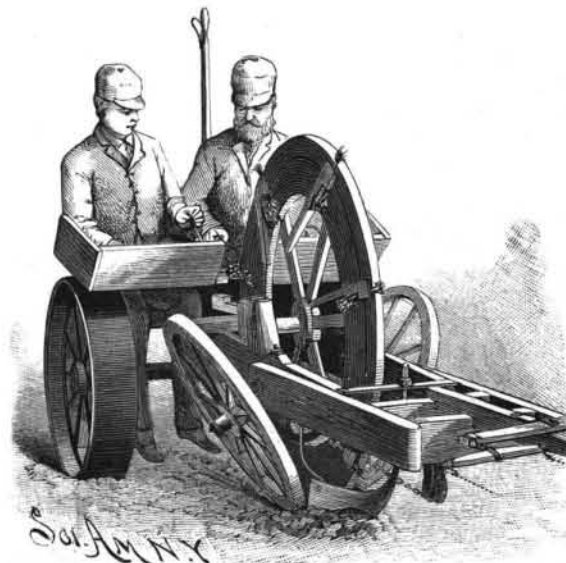
ADY & HAITH'S CULTIVATOR BEAM AND POINT.

without injury and without jerking the plowman or team.

This invention has been patented by Messrs. N. J. Ady and J. W. Haith, of Rockport, Atchison County, Missouri.

IMPROVED TOBACCO PLANTER.

The accompanying engraving illustrates a planting machine especially adapted for automatically setting tobacco plants, but also applicable for setting and resetting other plants or seeds. In the frame of the planter is journaled a large wheel which carries the plants to the ground. The forward end of the frame is supported by inclined wheels, which throw the earth back into the furrow and pack it around the roots of the plants. To the front of the frame is held the furrow-opening plow, which may be adjusted vertically to work at any required depth in the ground, and may be set nearer to or further from the plant-carrying wheel. The plow has a sharp nose portion to enter the ground easily, and has two rear wings which stand one at each side of the wheel to open a clean furrow somewhat wider than the tread of the wheel, and to protect the plant clamps, which are held to the right-hand side of the wheel rim. These clamps consist of clip blocks pivoted to lugs on the wheel, and pressed at their outer ends to or toward the wheel by springs. Behind the wheel is a plant-holding table having an opening, into one part of which the rim of the wheel enters, while in the other part is pivoted a plant-holding bed, upon which the plants are held in proper position to be seized by the clamps. To a hanger fixed to the frame is connected a plate, which is preferably elastic, against which the tails of the jaws of the clamps strike, to open them at the proper time for dropping the plants into the furrow. Another block, fixed to the frame, is so arranged as to open the clamp jaws as they rise to the table to grasp the next plant.



SIMMONS' IMPROVED TOBACCO PLANTER.

One of the clamps—the number of which is governed by the distance apart at which the plants are to be set in the ground—grasps a plant and carries it around forward until it is held root downward, in the furrow. The clamp then opens, its tail striking the block, and the plant drops into the furrow, when the inclined wheels roll the earth back into the fur-