

THE EARLY HISTORY OF WHEELED VEHICLES AND RAILWAYS.

NUMBER 1.

"Men of genius have a hard time, I perceive; and must expect contradictions next to unendurable—the plurality of blockheads being so extreme!"—CARLYLE.

Nothing, perhaps in the history of human achievement is more interesting and instructing than the opposition offered by cupidity and prejudice to those great mechanical improvements and inventions which are the just pride and boast of the nineteenth century. We boast that our age is distinguished from all other ages, and endowed with a special wonder and glory by its material triumphs; that we have compressed the huge globe into a neighborhood and brought all its interests within the system of a daily newspaper; that we have caught and harnessed the wild forces of Nature that tear the arteries of the earth and heave volcanoes; that even magnificent Nature herself has been humbled to toil all day at our looms and in our factories, without food, without sweat, and without weariness; and made to run on our meanest messages. Yet all this was accomplished in the face of violent opposition.

It may at first sight seem unreasonable and ungrateful that men, while constantly striving to better their condition, should be constantly opposing those who are contributing most to their success. But in truth, it is an hostility which has its origin in the diversities of temper, of understanding, and of interest which are found in all societies, and which will be found so long as the human mind continues to be drawn in opposite directions by the charm of novelty and the charm of habit. It has been the fate of every man who has ever attempted to enlarge the knowledge, or lessen the sufferings, or increase the comforts of his race, to be withstood by the most unreasonable opposition and well nigh overcome by the most bitter ridicule; and it always must be so. No man, not utterly destitute of all candor and judgment, will deny but that, in some age anterior to the dawn of history, there were fools who opposed the introduction of the alphabet and the plow with as loud complaints and as bitter invectives as our ancestors did that of the stage coach and the penny post; as we in our time have opposed railroads and telegraphs, and as fools, in some age yet far in the future, will resist some new invention or some new innovation of which the world has not now the faintest conception.

The workings of this strange species of human obstinacy, an obstinacy which the accumulated experience of nineteen centuries of progress has not been able to cure, is surely deserving of the greatest consideration, as the proper result of a cause lying deep in the innermost recesses of human nature, and which, while tending to degenerate us into bigoted dotards, has saved us from becoming shallow and reckless empirics. It will be our endeavor, therefore, to relate the history of that cruel opposition, meted out so unsparingly to those wonderful inventions now never mentioned without respect and gratitude in any part of the globe.

Of all inventions, the alphabet and printing press alone excepted, those inventions which abridge distance have undoubtedly done the most for the civilization of our species; and with these we propose to begin. To improve the means of locomotion afforded to man by Nature has been the intricate problem which all nations from the earliest dawn have attempted to solve; but in truth, it is only within the lifetime of the past six generations that anything approaching a solution has been arrived at. Two hundred years ago there did not exist in all England a single navigable canal, not an inch of railway (as we understand the term), not a public conveyance that would bear comparison with the most lumbering farm wagon that can now be found on the prairies beyond the Mississippi, and not a mile of road which the traveler of today would not consider as impassable. The accounts that have come down to us of the state of travel in England under the reign of "Old Rowley, the King," are indeed surprising in the extreme. It was by the highways that both travelers and goods passed from place to place, and those highways appear to have been far worse than the most ruinous roads that can now be found outside of the sheepwalks of Australia or the jungles of South Africa. Thorsby has left us accounts of journeys made with a guide along roads that lead "over most prodigious high hills," "steeper, than the roofs of many houses," of rides "along the edge of precipices that grew to that light and steepness, and with all so exceeding narrow, that we had not an inch of ground to set foot upon to alight from our horses;" and of tramps over highways "full of ice and snow, rougher than a ploughed field, yet hard as iron." Hagbush lane, the principal bridge path from London to the north of England, was worn so deep that the rider's head was beneath the level of the ground on either side, and so narrow as barely to afford passage for a single horseman. Indeed, in many parts, being once in it, to turn back became utterly impossible, such was its extreme narrowness! Nor does this seem to be the exception rather than the rule. John Marriott has left us a humorous ballad on the "Devonshire Lane," which certainly justifies the belief that that "bit of the road" was in a condition quite as ruinous. Even on roads which the Englishmen of that day were accustomed to regard as the best, the ruts were deep, the descents precipitous, and the mud often lay so thick that all communication was cut off for months at a time, between towns separated by scarcely a score of miles.

Over such roads as these, as may well be supposed, the only practicable method of traveling was on foot or on horse. The rich rode: the poor walked. What the latter lost in comfort and speed they more than made up in safety, for the dangers of the road were by no means confined to its rugged-

ness. The mounted highwayman, a marauder known to this generation only from books, was to be found on every main road. The members of Parliament, the country gentlemen, and the rural merchants traveled in bands from the remote counties to the capital, armed with swords and pistols, and in hourly fear of being stopped and plundered by Turpin or Bradshaw, Duval or Macheath, or the hundred other celebrated banditti who infested the great North Road, Hounslow Heath or Shooter's Hill. Justices rode the circuits in jack boots, the bar following on foot, surrounded by a numerous escort armed to the teeth. Indeed a sum of money, called "dagger money," was annually contributed by the sheriff for the purpose of providing such escort with weapons.

Such a state of affairs in our day would be made the subject of "indignation meetings," "reform associations," and loud public demands for improvement. But with themen of Charles II's time, the case was quite the reverse; they vigorously resisted improvement; and it was not till many toll bars had been violently pulled down, and some blood shed, that a good system of road repairs was established; and not till the stage coach had been made the subject of much heated discussion, and numberless grave pamphlets and petitions to Parliament for its suppression had appeared that it ceased to be looked upon as a crying evil. This latter mode of conveyance was first introduced into England in the closing days of the Protectorate, but did not excite much public interest till the spring time of 1669, when a daring innovation was attempted. It was announced that a vehicle described as the "Flying Coach" would make the journey, "Providence permitting," from Oxford to London between sunrise and sunset. This spirited undertaking was solemnly considered and sanctioned by the heads of the University, and appears to have excited the same kind of interest which is excited in our day by the opening of a new railway. The success was complete; but with the boasts of its supporters were mingled the complaints and invectives of its enemies. Large interests had been unfavorably affected, and as usual many were disposed, from stupidity and obstinacy, to clamor against the innovation simply because it was an innovation. In John Crasset's "Reasons for Suppressing the Stage Coaches," published in 1672, they are denounced as one of the greatest evils that had happened of late years to the kingdom; mischievous to the public, destructive to trade, and prejudicial to lands. The breed of horses would be destroyed, and men would grow careless of good horsemanship; the Thames, that had so long been the important nursery of seamen, would cease to be the chief thoroughfare from London up to Windsor and down to Gravesend; and saddlers and spurriers would be ruined by hundreds. It was vehemently argued that those who traveled in coaches became weary and listless when they rode a few miles and were unwilling to get on horseback, "not able to endure frost, snow, and rain, or to lodge in the fields"; that to save their clothes and keep themselves clean and neat, people rode in coaches; that this was ruinous to trade, "for that most gentlemen, before they rode in coaches, used to ride with swords, belts, pistols, portmanteaus, and hat cases, which in these coaches they have little or no occasion for"; and that after traveling two or three journeys on horseback their "clothes were wont to be spoiled; which done, they were forced to have new very often, and that increased the consumption of the manufactures and the employment of the manufacturers, which traveling in coaches doth no way do." Such were the cogent reasons for which our worthy forefathers demanded that the stage coach should be "put down." How it ultimately triumphed over all opposition, and became, with its rosy gilled coachman and facetious guard, its upsets and break downs, its "outsides" and "insides," a peculiarly English institution, is familiar to all readers of English novels for three generations back.

The Scientist.

Mr. Proctor recently asked for a single word, which, without being objectionable, should convey the meaning of "man of science." Mr. Gosse has recently suggested the name "scient"—a word which receives the support of Mr. A. J. Ellis, who, in the *Academy* for September 19, says: "I beg leave formally to introduce a scient into this heterogeneous company (from 'an incumbent', through 'a president', to 'an insolvent'), and to propose that this strictly formed dissyllable should take the place of the American barbaric trisyllable 'scientist'." A 'scient' would not mean one who 'possesses knowledge in general' so much as one who rejects all but knowledge for the foundation of hypotheses, and therefore constructs only with such materials as he already 'knows'. A 'scientist' would then be an 'adherent to sciences.' It will be seen, however, from the letter of a correspondent that the word is not entirely unobjectionable, as it may be confounded with Science when it is spoken in the plural.—*English Mechanic*.

We suggest that our cousins call him the "sci-ist," which will be O. K., used in the singular or plural.

Cause of Some Blasting Accidents.

One cause of accident in blasting, but little understood, and which applies to powder as well as nitro-glycerin, is thus stated: "The blaster, not aware that he is a walking charge of electricity, proceeds to his work, inserting cartridge after cartridge of nitro-glycerin, until he comes to the last, which is armed with the electric fuse. The moment his hand touches one of the naked wires, the current passes through the priming, and explosion follows. Let a blaster, before he handles these wires, invariably grasp some metal in moistened contact with the earth, or place both hands against the moist walls of the tunnel."

Buying a Horse.

The following hints on examining a horse appear in *The Maryland Farmer*. They contain much good advice to the non-professional dealer, but fail to cover all the defects a horse may possess. But the chances are that the purchaser who gets a horse free from every defect herein enumerated will have a pretty sound animal.

Examine the eyes in the stable, then in the light; if they are in any degree defective, reject.

Examine the teeth to determine the age.

Examine the poll or crown of the head, and the withers, or top of the shoulders, as the former is the seat of poll evil, and the latter that of fistula.

Examine the front feet; and if the frog has fallen, or settled down between the heels of the shoes, and the heels are contracted, reject him; as he, if not already lame, is liable to become so at any moment.

Next observe the knees and ankles of the horse you desire to purchase, and, if cocked, you may be sure that it is the result of the displacement of the internal organs of the foot, a consequence of neglect of the form of the foot, and injudicious shoeing.

Examine for interfering, from the ankle to the knees, and if it proves that he cuts the knee, or the leg between the knee and the ankle, or the latter badly, reject.

"Speedy cuts" of the knee and leg are most serious in their effects. Many trotting horses, which would be of great value were it not for this single defect, are by it rendered valueless.

Carefully examine the hoofs for cracks, as jockeys have acquired great skill in concealing cracks in the hoofs. If cracks are observable in any degree, reject. Also both look and feel for ringbones, which are callosities on the bones of the pastern near the foot; if apparent, reject.

Examine the hind feet for the same defects of the foot and ankle that we have named in connection with the front foot. Then proceed to the hock, which is the seat of curb, and both bones and blood spavins.

The former is a bony enlargement of the posterior and lower portion of the hock joint; the second a bony excrescence on the lower, inner, and rather anterior portion of the hock; and the last is a soft enlargement of the synovial membrane on the inner and upper portion of the back. They are either of them sufficient reason for rejecting.

See that the horse stands with the front feet well under him, and observe both the heels of the feet and shoes to see if he "forages" or overreaches; and in case he does, and the toes of the front feet are low, the heels high, and the heels of the front shoes a good thickness, and the toes of the hind feet are of no proper length, reject him; for if he still overreaches with his feet in the condition described, he is incurable. If he props out both front feet, or points them alternately, reject.

In testing the driving qualities, take the reins while on the ground, invite the owner to get in the vehicle first, then drive yourself. Avoid the display or the use of the whip; and if he has not sufficient spirit to exhibit his best speed without it, reject. Should he drive satisfactorily without, it will then be proper to test his amiability and the extent of his training in the use of the whip.

Thoroughly test his walking qualities first, as that gait is more important in the horse of all work than great trotting speed. The value of a horse, safe for all purposes without blinds, is greatly enhanced thereby.

Purchase of the breeder of the horse if practicable; the reasons are obvious.

MR. LE NEVE FOSTER, an English Government Inspector of Mines, has given notice to the managers of Cornish mines to comply with the act, and remove their vertical ladders and put them "on the lay." This is an alteration which will prove a great boon to the working miners. It is a terrible task for a man to climb up vertical ladders, sometimes from 180 to 260 fathoms deep, after working, perhaps in bad air, for eight hours. The climbing of these ladders has given the miners a peculiar complaint in the lungs, unknown to miners who ascend and descend in any other way.

Recent American and Foreign Patents.

Improved Grain Cleaner.

Samuel B. Johnson, Oswego, N. Y.—This invention contemplates the improvements of grain cleaners by a novel organization of elements that relieves the grain of all dust or chaff in a speedy and efficient manner, the machine itself being cheaper in construction and doing its work more economically than those now known to the public.

Improved Steam Trap.

William H. Jenkins, Philadelphia.—The object of this invention is to reduce the cost and increase the reliability and general efficiency of steam traps of the class in which a rising and falling float is employed to operate the valve or valves that control the discharge of the water of condensation accumulated in or received from the connected steam-heating coil pipe or vessel. The invention consists in providing a hollow float with a tube through which steam is admitted, and by which the water condensed therefrom escapes into the chamber of the trap. The float has no other outlet save the tube. The invention further consists in a weighted valve for discharging the water which fills the lower portion of the trap below the line of buoyancy of the float. The invention also consists in the construction of the filter through which the water, condensed in the steam-heating coil, pipe, or vessel, flows into the trap.

Improved Fence.

William C. Banks, Como, Miss.—This invention consists in forming a fence of rails, stakes, posts, and blocks, so that it is entirely protected against winds, floods, or storms, and, being without tenon or mortise, may be constructed at a very small expense.

Improved Water and Gas Meter.

Thomas M. Shank, St. Albans, W. Va.—This invention consists in novel and greatly improved means for rocking the valve which admits and allows the discharge of the fluid. The invention not only simplifies the instrumentalities by which the oscillation is produced, and thereby greatly lessens the liability to get out of order, but insures perfect accuracy and uniformity of action in the measurement.

Improved Wheat Cleaner.

Herman Kurth, Milwaukee City, Wis.—This invention relates to improved means for freeing wheat of light or defective grains, cockle, or other impurities. It consists in the mode of suspending and rotating the cylinder; the application of a wiper wheel for vibrating a sieve or cleaner within the cylinder; the arrangement of an inclined plate or board to convey defective wheat grains, cockle, and other foreign seed from the inner periphery of the cylinder to a trough located above the sieve by which they are discharged; and in attaching elastic blocks to the wiper wheel to break the fall or concussion of the yoke, whose movement imparts vibratory movement to the sieve.

Improved Mail Bag Holder.

Blanchard Chamberlain and Augustus G. Wright, Bellefontaine, Ohio.—This invention consists in making the standards which support a mail bag in two parts, one of which may be adjusted on the other to raise or lower it. Also in angle plates to support the rear weighted lever horizontally on the top of the post when the mail bag is upon it. Also in a pivoted cover to work with the lever and always exclude dirt from the space between the angle irons.

Improved Machine for Cleaning and Separating Grain.

Herman Kurth, Milwaukee City, Wis.—The object of this invention is to provide a machine for cleaning and separating grain from cockle and other impurities. It consists in a tapering metallic cylinder suspended upon double acting friction wheels, and provided upon its inner periphery with flat-bottomed cavities. Said cylinder is rotated by the friction wheels, and has two guide rollers to keep it steady. At one end of the cylinder is a grain receiver, consisting of a series of sieves, which said receiver is extended through the cylinder in the form of two chutes, one for the impurities, and the other for the grain. The grain receiver and chutes are supported upon springs, and agitated by means of eccentric barrels. Inclined toward the top chute, inside the cylinder, are two adjustable slide boards which convey the impurities which drop from the cavities in the cylinder into the top chute; and just above said slides is a reciprocating brush, which engages the inner periphery of the cylinder and insures the removal of all particles of dirt, chaff, etc.

Improved Slate Roof.

William Ellis Elliott, St. Denis, Md.—This invention relates to new and improved methods of roofing, and consists in the use of slabs of slate, instead of ordinary tiles, having chamfered edges and joined together in seams at right angles to the ridge pole, by means of a cement, and supporting each other by means of grooves in their upper ends running parallel to said ridge pole. Said slabs are screwed to up and down pieces, resting upon a felt or other waterproof sheathing, which pieces divide the space between the slabs and said sheathing into two compartments, one passing up the middle of the slabs, extending up and down the incline of the roof and forming a ventilating passage, and the other fashioned into a trough and passing up and down the roof just beneath the seams where the slabs join, to receive and conduct away any leakage which may result from the breaking of the cement.

Improved Spring Board for Vehicles.

George E. Norris, Glen's Falls, N. Y.—The object of this invention is to provide spring board wagons with a support by which the board may be readily kept level or crowned, as required, and thereby a lighter and better looking vehicle obtained. A spring board has central springs and longitudinally connecting brace rods, which are adjustable thereon for setting the board.

Improved Music Leaf Turner.

George W. Rogers, South Brooklyn, N. Y., assignor to Ida Rautenberg, New York city.—This invention consists of a slide for moving the swinging wires for turning over the leaves, the said slide being arranged to run in a race a little below, and partly in front of, the lower arms of the leaf-turning wires. It has a little tongue rising a little higher than the arms, that springs behind each arm when it passes the outer end, swings the arm around as it moves back, and passes the axis of the arm. The slide is worked in one direction by a foot treadle and cord, and in the other by a spring. The leaf-turning wires are pivoted side by side in a row parallel with the slide face, so that whichever way they may be turned the front wire will swing a little short of the next at the outer end. When the tongue passes off the front wire, to spring beaded to swing the wire forward, it will strike against the next wire, and thus be prevented from engaging it. A notched bar is arranged alongside of the foot treadle, to engage and hold it against the spring at any point.

Improved Watch Regulator.

Foster Keeping, New York city.—This is an attachment for regulating the balance spring in connection with the hands, in exact proportion to the distance to which they are moved forward or backward on the dial, so as to admit thereby the mechanical regulating of the watches without opening the inner cap and interfering with the interior part of the watch mechanism. A pinion is keyed to the set hand square, for gearing with an intermediate spur wheel at the end of a spring slide piece when the same is carried forward, which wheel gears also with a sector-shaped wheel of the balance spring, for regulating the same by turning the hand square. When, therefore, the slide piece is carried forward and the hands turned by the key, the pinion causes the turning of the gear wheel and of the sector wheel. The regulation of the balance spring, and thereby that of the watch, is effected by simply pressing on the slide end and setting the hands in forward or backward direction.

Improved Joint for Check Row Cords.

Lysander L. Haworth, London, Ohio.—The object of this invention is to provide a joint for check row cords, used for dropping devices in corn planters, so that the cord can be readily unhooked and passed around trees, and be hooked again without requiring the changing of the corn-planting implement, or the position of the cord across the field. There is a metallic bell-shaped sleeve with projecting hook, which is jointed to the connecting hook, while the sleeve is firmly closed or clinched on the loop-shaped cord end after passing the same around the hook. The joint is thus adapted to serve as stop, and as connecting and detaching device for any part of the check cord.

Improved Valve.

Hamilton D. Lockwood, Charlestown, Mass.—This valve is mainly for use with rubber piping, it being located in a short section of tube, over flanged ends of which the rubber pipe fits. One portion of the short tube extends into the valve box and opens upward with a flanged aperture. By pressing the upper arm of a spring toward the cap, a pin is forced inward, which presses the middle part of a rubber disk down upon the flange of the hole, and closes the valve securely. At the same time, the end of the upper arm of the spring is caught by the spring catch, which holds the valve closed until released by pressing back the catch, when the elasticity of the rubber disk raises the pin, and the valve is again open.

Improved Pen and Pencil Case.

Richard M. Collard, New York city.—The works of this pen and pencil case are so contrived that the extension tube may be forced down by the pen slide to force the pencil back into the case when the pen is shoved out, and yet the extension tube may be drawn back for use all the same. There is also an improved way of fastening the revolving tube in the stationary tube, so that it can be readily unfastened when it may be required to do so.

Improved Pulp Regulator for Paper Machines.

Robert Hutton, Holyoke, Mass.—A box, of nearly square form, has two vertical partitions, between which is a space, which is covered over with a flexible waterproof diaphragm. The pulp flows up in one compartment to the flexible diaphragm, and thence over a partition to two small compartments. When the pulp is thick, it will not pass over the partition so readily, and will gather on the diaphragm and will depress it, and also a plate beneath on the inner end of a scale beam, which raises the outer end and an adjustable weight, thus operating a simple mechanism, which has the effect of raising a valve, which allows water to flow into and mingle with the pulp which is flowing down to the pulp reservoir. The flow of pulp is increased to one compartment and diminished to the other, according to the direction in which a gag moves.

Improved Turbine Water Wheel.

Joseph E. Safford, Hartford, Vt.—There is a prolongation of the inner ends of the buckets below the lower rim of the wheel. These extensions are inclined backward and outward relatively to the direction in which the wheel turns. The gates are pivoted at the middle, so that the pressure or the water will balance on them, and at their outer ends the chutes have an offset formed on the circle described by them, so as to cut off the water from behind, and at the same time allow the gates to swing far enough to shut tight at the inner ends.

Improved Grain Binder.

James L. Skelly and William Skelly, Sparta, Ill.—In this invention there is a needle for passing the twine through the gavel, a clamp or loop catcher for receiving and holding the twine while the needle goes back, and an arm for carrying the twine around the bundle. Apparatus is provided for operating this mechanism, and there are clamps for compressing and holding the bundle while being bound.

Improved Boiler Feeder.

Philip T. Brownell, Elmira, N. Y.—This invention consists of a double chambered hollow cylinder, having a slow oscillatory movement imparted to it by any suitable connection with the operating gear of the engine. Ports in the chambers are thus alternately caused to register with ports in the heater, a feed pipe to the boiler, and with a steam pipe connecting with the boiler at the water level, in such manner that one of the chambers will be receiving water from the heater while the other is being emptied into the boiler. This last is caused by the action of steam admitted through the steam pipe to the surface of the water.

Improved Book Holder.

Andrew J. Furr and Walter C. Knaus, Boonsborough, Mo.—The side edges of the book cover are clamped against hooks by set screws, which pass in through sliding blocks. The leaves are held by fingers pivoted to pins attached to the blocks, upon which are placed coiled springs by which said fingers are held down upon the book leaves. By this construction, by moving the fingers to one side, the leaves can be conveniently turned. In using the holder, bars are placed upon the bed just beneath the shoulders of the invalid. The book is then, by means of the mechanism, adjusted to the proper height, and also farther from or nearer to the reader's eyes.

Improved Surface Blow-Off.

Robert Waugh, New Orleans, La.—This invention consists of a kind of hollow flat skimmer, with wide openings to receive the surface water from all directions, suspended in the boiler from an outside support, in which it is vertically adjustable. It is provided with a test cock at the top, by which to determine the position of the skimmer relatively to the water to receive the scum from the surface, and also with a blow-off cock, through which the scum will be expelled. The arrangement is such that the escape passage will not be affected by the rising and falling of the pipe.

Improved Pulley Block Hanger.

Ray Howland, Brooklyn, N. Y.—This is an improvement upon the device for which letters patent were granted to G. B. and C. Lewis, January 1, 1867, and it consists of a U or equivalent shaped bar, to the bottom of which the pulley blocks are attached. Upon the insides of the upper ends of the branches are jointed catches, with which adjusting screws are combined in such manner that the hanger can be readily and firmly attached to any overhead beam by placing the catches one on each side of the beam, and pressing them against the sides by the screws. The object is to provide a simple and efficient hanger for use in warehouses, by which to suspend the pulley blocks, or hoisting tackle temporarily over any part of the floor, which is often required for handling and piling packages, etc.

Machine for Applying Paris Green Compounds to Cotton Plants.

Charles H. Levy, Natchitoches, La.—Two cylinders are made of fine wire gauze. To the inner surfaces are attached longitudinal strips, to one side of each of which is attached a strip of tin, which thus form flanges, which, as the cylinders revolve, raise the compound and allow it to fall back, so as to keep it stirred up. These cylinders are mounted on the ends of a crank shaft which is supported in a frame and rotated by suitable mechanism.

Improved Lathe Dog.

William Grout, New York city, assignor to Levi A. Fuller.—This is a carrier to take the place of the numerous iron dogs which are used on the face plate of iron lathes. It is composed of two jaws connected together by the pivot bolt which passes through the face plate of the lathe. The carrier is fastened to the face plate by means of screw nuts, so that it will stand out an inch from the surface of the face plate. Notches are cut on the inner sides of these jaws to more effectually hold a square or round piece of iron. The clamp is made to hold by means of a curved ratchet bar and thumb nut. By means of a ratchet and screw the jaws can be adjusted so as to hold any article from the size of a quarter of an inch up.

Improved Pruning Shears.

Orson P. Smith, Buford, and Andrew W. Miller, Morrisonville, Ill.—A hook-shaped cutting blade slide on a main bar, to the uppermost end of which is pivoted a lever. The opposite end of the latter is again pivoted to a brace bar connected with an extension lug near the lower end of the hook blade. A cutting blade or knife is pivoted to an intermediate point of the lever and to the hook blade at suitable distance from the cutting part of the same. A spring serves to secure the sliding part of the hook blade, for the purpose of keeping the shears in open position ready for cutting. The hook blade is placed on the branch to be cut, and the main bar pulled down, which produces the upward motion of the knife blade and the closing of the same on the hook for cutting off the branch or limb.

Improved Bilge Water Gage.

William G. Conklin, Seattle, Wash. Ter.—This invention consists of a tube formed partly or wholly of glass with a valve in the bottom to allow the tube to fill, and a scale on the side to show the measure of the height of water in the tube, which will be the measure of the depth of water in the hold. The valve is arranged so as to be forced open to admit the water by the stem striking the bottom, and closed by a spring.

Improved Grain Binder.

Pascal Whitney and Newell Whitney, Osage, Iowa.—This invention relates to certain improvements in grain binders. It consists in a curved passage for the grain, formed by a slotted plane surface on one side, and spring guide bars on the other. Down this passage moves a rake, attached to chains passing over rag wheels, which gathers up a gavel of grain and presses it forward to a feed which carries it under a presser foot, where it is sewn through and through by a sewing machine device, and the sheaves afterward separated from each other by a knife.

Improved Pump for Hydraulic Press.

Herman Thalheim and Joseph Gordon, Atlanta, Ga.—This invention relates to that class of double-acting pumps which are used in connection with hydraulic presses, and consists in placing upon the piston rod of a steam cylinder a much smaller pump piston, constructed to operate in a water cylinder with an alternating high pressure and low pressure stroke by reason of the smaller volumes of water on one side of the said small piston occasioned by the displacement of the same by the rod.

Improved Rein Holder.

Albert K. Smith, Nebraska, O.—This device is designed to take the place of the ordinary rein ring now in use on harness hames. It consists of a frame containing two metal rollers held against each other by spring pressure. The objects of the invention are to prevent the twisting of the reins and their falling underneath the animal's feet—inconveniences which commonly attend the use of the ordinary ring.

Improved Neck Yoke.

William A. Lloyd, Cheshire, Mass.—The object of this invention is to relieve the horses from the sudden strain caused by the pole and collar connecting chains, when the vehicle pole is thrown, by rough roads or obstructions, in an upward or downward inclined position. Spreading rods are adjustably applied to the pole end of a vehicle. Connecting chains extend from the ends of the rod to the extremity of the pole. The triangles formed by spreader rods and chains swing readily at both sides above and below the pole, according to the higher or lower position of the same, and neutralize thereby the injurious and annoying jerks.

Improved Apparatus for Spreading Plasters.

William G. Neubauer, Long Island City, N. Y.—This is a device for spreading plasters, consisting of a bed having adjustable hinged straps and hinged plates, which hook over a straining rod so as to tightly clamp the cloth to the bed by means of a straining screw. There are plates for round plasters and another plate having apertures for ear plasters. These are secured to the bed by thumb screws and may be clamped down by straps. The spreader is a metallic bar of any desired length. When the material for the plaster is laid upon the cloth, this spreader, heated to the proper temperature, is moved over, and melts and spreads the gum evenly, leaving the margin of the cloth, which is covered by the straps and plates, clean and free.

Improved Spark Arrester and Consumer.

Thomas E. Roberts, Ionia, Mich.—By suitable construction, as the sparks rise through the smoke stack, they are divided and guided into the space between a ring and the enlarged top of the smoke stack, and are guided by V partitions into spouts, through which they pass into the space between the walls of the smoke box and a jacket, and thence through the outer row of flues into the firebox, where they are consumed.

Improved Folding and Extension Trestle.

Hiram K. Stevens, Providence, R. I.—This invention consists of a pair of vertical posts with braces jointed to them at the top to fold against the posts for packing away, and having other braces to hold them in the extended position for use. The posts are made in two parts, placed a little apart and connected by cross pieces to form guides. In the latter extension posts connected by a cross beam at the top work up and down to vary the height of the bench. The whole forms a simple and cheap bench for plasterers and others to use for holding stagings inside of rooms of different heights. The extension posts are fastened at any required height by pins put in holes in them above the cross bars of the main posts.

Improved Oar Lock.

George L. Stuck, Selma, Ala.—This invention consists in the employment of a bridge chain, the ends of which are attached to the oar, while its middle portion is connected with the oar lock through the medium of a projection on the latter, which fits in one of the links of the chain. By the provision of the bridge chain, the oar is secured to the oar lock, so as to prevent it from slipping through the same; and furthermore means are also furnished for adjusting the oar in a longitudinal direction, so as to increase or diminish the leverage, the swivelled oar lock enabling the vertical and horizontal movement of the car to take place.

Improved Cutter Head.

George Montgomery, Galena, Ill.—This is a double cutter head in combination with the eccentric journal of a revolving shaft having a radial stop. A stop is arranged symmetrically to the point of greatest eccentricity of the spindle, producing thereby the throwing out of the cutting edge to a greater distance from the axis of the shaft, whose shoulder is carried against the stop. The other cutting edge is thereby thrown within the circle formed by the revolving outer edge, so as to clear the work completely. By reversing the motion of the shaft, the cutter head is carried with its opposite shoulder against the stop, producing thereby the eccentricity of the other cutting edge, and the clearing of the former. The cutter head is secured by washer and lock nut on the spindle, and automatically reversed by the reversing of the shaft motion, forming thereby a strong cutting device for molding purposes.

Improved Means for Propelling Boats.

William H. Holdam, Crab Orchard, Ky.—The longitudinal guide ropes are arranged near both banks in such a manner that boats may be run in both directions on the canal without interfering with each other. By turning a lever pawl to one side, friction pulleys are instantly applied to a guide rope, and the boat is propelled thereby, being detached by turning the pawl in opposite direction, so as to rotate without imparting motion to the boat. A reversing gear of the engine admits of the ready propulsion of the boat on the same rope for the purpose of backing up in landing, etc. Lateral guide rollers are applied in front and rear of the friction rollers for taking up the sagging rope and guiding it in horizontal position to and from the friction rollers.

Improved Machine for Dressing Millstones.

Samuel G. Johnson, William S. Terry, Robert Y. H. Terry, and Alonzo W. Terry, Hamburg, Ark.—The standards are laterally connected by strong bars carrying at the front a top bar, with hollow screw, which guides the shaft of the pick bar, and controls also a coiled spring, by which the force is imparted to the blows of the pick bar. A curved lever is inserted loosely with its free end into a hole at the top of the pick bar below the spring. Its shorter rear end is provided with a small roller, on which a ratchet wheel acts, operating the front end of the lever, raising the pick bar, and producing short, rapid blows of the same by the force of the coiled spring.

Improved Screw Propeller.

Philo M. Blatchley, Guilford, Conn.—This invention consists of detachable blades for propeller wheels, secured to the hub by the inner end fitted in a dovetail spiral groove, and keyed in the groove by a key, which is itself secured by collars screwed against the hub by a nut screwing on the outer end of a shaft. By this means the blades are fastened more securely than when bolted through a flange. The hub is as smooth and free from projections as a solid hub, and the blades may, on account of not requiring a flange by which to fasten them, be made of steel plates, of which they may be shaped by stamping or pressing in dies.

Improved Scaffold.

Charles M. French and John J. McFadden, Akron, O.—This is a scaffold which comprises four slotted corner posts, connected in pairs by horizontal platform beams, which are capable of being adjusted in a vertical direction through the medium of long screw shafts passing directly through the top ends of the vertical slotted parts, through the tenoned ends of the vertically adjustable platform beams, and bearing at their lower ends against metallic plates at the bottom of the slots in the posts. The devices above referred to constitute the means for adjusting the scaffold beams in a vertical direction, while the longitudinal expansion or contraction of the entire scaffold is effected by means of slotted braces or connecting bars, which extend either in a diagonal or horizontal direction, and are attached in an adjustable manner to the corner posts.

Improved Horse Protector.

Reuben P. Lawton, Oramel, N. Y.—In this device the headpiece may be used in place of the check rein, and be thrown out of the way on detaching it, while the body of the protector is so applied to the bit that the horse may be readily unhitched without being hindered thereby. The reins are furthermore guided and supported in such a manner that no entangling of the tail with the same is possible.

Treating Animal Fats and Manufacturing Artificial Butter.

William L. Churchill, Rahway, N. J., and Jacob L. Englehart, New York city, assignors to Churchill Dairy Company, New York city.—This process consists in softening, washing, and disintegrating the fat of animals for the purpose of rendering the oleomargarin and stearin separable from the membranous tissues. The hashed fat is then heated by steam for the purpose of melting the same and rendering its elements mobile. Hot air is forced through the same while in the heating caldron for the purpose of effecting the thorough separation of said oleomargarin and stearin from the useless tissues, by means of which the oleomargarin and stearin are eliminated from the tissues, and left in such relative positions in the caldron as to be readily separated. The eliminated pure fat is maintained at a temperature of 110° Fahrenheit for twelve hours, after which the partial separation of the oleomargarin and stearin is accomplished by decantation, and the complete separation of the oleomargarin from the stearin is effected by compression in cotton bags at a temperature of about 80° Fahrenheit. For these purposes a suitable agitating and purifying apparatus is employed.

Improved Seed Planter.

Lawrence S. Connor, Orangeburg, S. C.—This invention relates to certain improvements in seed planters, and consists in the peculiar construction and arrangement of an opener with reference to the furrow wheel the combination with the after portion of the frame of an adjustable cover, and the construction and combination of devices for operating and adjusting the feed in the bottom of the grain box.