

of iron; and in this country, the proportion of iron to wooden steamers, now in process of construction, is as 21 to 4.

The first iron vessels were built in the same general manner as wooden ones, with iron ribs and sheathing. It soon became evident, however, that the same strength could be secured with much less material, by building vessels in the same manner as beams are made, and hence the introduction of the longitudinal system. This system has now been generally adopted in England for light draft vessels.

In this country, iron vessels have generally been constructed on the transverse system. The vessel proposed by the writer for service in western waters is to be built on the longitudinal system; and the bottom sheathing, to ensure great elasticity for resisting shocks, is not secured to the transverse bulkheads or frames, the connection of the bottom plates being made exclusively to the longitudinal frames. A comparison of this proposed vessel with a wooden steamer of the same general dimensions, is as follows:

	Iron vessel. Tons.	Wooden vessel. Tons.
Hull.....	147	270
Deck.....	112	112
Machinery and wheels.....	93	93
Water in boilers.....	20	20
Joiner work.....	40	40
Fuel, fittings, etc.....	25	25
The total weight.....	437 tons	560 tons
Mean draft.....	26 inches	32 inches
Cost complete.....	\$100,000	\$85,000
Durability.....	20 years	10 years
Value at the end of this time.....	\$20,000	\$15,000
Annual depreciation during service.....	\$4,000	\$7,000
Freight carried on mean draft.....	658 tons	535 tons
Net profit finally.....	\$22,137	\$14,250

#### A New Use for Chicken Feathers.

Chicken feathers are among those waste products of the farm of which no regular means of utilization has heretofore been suggested. Myriads of them are strewn over the barn yard, packed into the floor of the chicken house, or are converted into positive nuisances by the wind which bestrews them over lawns and flower beds, or drives them into open doors and windows. The down alone, we believe, occasionally used as a stuffing for pillows or cushions, and sometimes employed as an adulteration in goose feathers; but the long plumes of the wings, sides, and tail of the bird, unless made into rude bundles to serve as dusters for the housewife, are generally regarded as totally worthless.

"According to statistics very carefully compiled," says a writer in *La Nature*, "we throw away yearly a quantity of chicken feathers, the intrinsic value of which is equal to the money which we pay out for cotton." A startling statement, but the author considers it true; and he proceeds to explain how the feathers are prepared to render them valuable: The operation is to cut the plume portions of the feathers from the stem, by means of ordinary hand scissors. The former are placed in quantities in a coarse bag, which, when full, is closed and subjected to a thorough kneading with the hands. At the end of five minutes, the feathers, it is stated, become disaggregated and felted together, forming a down, perfectly homogeneous and of great lightness. It is even lighter than natural eider down, because the latter contains the ribs of the feathers, which give extra weight. The material thus prepared is worth, and readily sells in Paris for, about two dollars a pound. About 16 troy ounces of this down can be obtained from the feathers of an ordinary sized pullet; and this on the above valuation, is worth about 20 cents. It is suggested that, through the winter, children might collect all the feathers about a farm, and cut the ribs out as we have stated. By the spring time a large quantity of down would be prepared, which could be disposed of to upholsterers, or employed for domestic uses. Goose feathers may be treated in a similar manner, and thus two thirds of the product of the bird utilized, instead of only about one fifth, as it is at present the case.

The chicken down is said to form a beautiful cloth when woven. For about a square yard of the material, a pound and a half of down is required. The fabric is said to be almost indestructible, as, in place of fraying or wearing out at folds, it only seems to felt the tighter. It takes dye readily, and is thoroughly waterproof. There appears to be a good opportunity here for some ingenious person to invent machines to cut and treat the feathers.

#### Bergen Hill Tunnel.

Work on the Bergen Hill tunnel, for the Delaware, Lackawanna and Western Railroad, has been lately commenced in earnest. Seven shafts are to be sunk, and 500 men kept at work day and night. The tunnel begins on the east side at the foot of Ferry street, Hoboken, and will be considerably above the Erie tunnel. The track will be elevated above the Erie road, at the west end, on a trestle, thus avoiding the danger and delay of crossing. It will take two and a half or three years to complete the tunnel.

#### IMPORTANCE OF ADVERTISING.

The value of advertising is so well understood by old established business firms that a hint to them is unnecessary; but to persons establishing a new business, or having for sale a new article, or wishing to sell a patent, or find a manufacturer to work it: upon such a class, we would impress the importance of advertising. The next thing to be considered is the medium through which to do it.

In this matter, discretion is to be used at first; but experience will soon determine that papers or magazines having the largest circulation, among

the class of persons most likely to be interested in the article for sale, will be the cheapest, and bring the quickest returns. To the manufacturer of all kinds of machinery, and to the vendors of any new article in the mechanical line, we believe there is no other source from which the advertiser can get as speedy returns as through the advertising columns of the SCIENTIFIC AMERICAN.

We do not make these suggestions merely to increase our advertising patronage, but to direct persons how to increase their own business.

The SCIENTIFIC AMERICAN has a circulation of more than 12,000 copies per week, which is probably greater than the combined circulation of all the other papers of its kind published in the world.

#### Inventions Patented in England by Americans.

[Compiled from the Commissioners of Patents' Journal.]

From January 14 to January 15, 1874, inclusive.

ENGINE, PUMP, ETC.—W. D. Hooker, San Francisco, Cal.  
 FILTERING LIQUIDS, GASES, ETC.—T. R. Sinclair, New York city.  
 GRINDING MACHINE.—C. Heaton, New York city.  
 MAKING SCREWS, ETC.—E. Nugent et al., Brooklyn, N. Y.

#### DECISIONS OF THE COURTS.

##### United States Circuit Court—Northern District of Illinois.

SHINGLE MACHINE PATENT.—HARRY H. EVARTS et al. vs. DAVID M. FORD.  
 [In equity.—Before Blodgett, District Judge.—Decided November 26, 1873.]  
 This suit was brought to recover damages for an alleged infringement of a patent for an improvement in shingle machines, issued to H. H. Everts, dated October 1, 1854, and extended for a term of seven years from October 1, 1865.

The court held substantially as follows:  
 A claim for "presenting the sides of the fibers of the wood to the action of the saws in the sawing of shingles or equivalent articles, for the purpose of giving them smoother surfaces than can be produced by the usual mode of sawing, if construed literally, asserts a right to a result, and cannot be sustained."

But if read as it should be with the specification, and interpreted to embrace the mechanism therein described, by which the result is accomplished, it is a valid claim.

A patent for a machine, in which a shingle bolt is automatically fastened by dogging teeth upon a rotating carriage which presents it sidewise to the action of a circular saw, is not infringed by a machine in which the bolt is by hand fastened to a reciprocating carriage and shoved up to the saw.

No recovery can be had upon a patent for using a machine which is neither described nor claimed in it, although the machine was originally devised by the patentee in the course of his experiments, which resulted in producing the patented machine, and although it has been the most extensively adopted.

If the patentee omits to notice in his patent the intermediate machines he produced in the course of his experiments, he must be presumed to have abandoned them.

The opinion of the Commissioner of Patents granting an extension is entitled to consideration on the question of novelty, but not on a question of infringement.

Bill dismissed.  
 L. L. Coburn, for complainants.  
 West & Bond, for defendant.

##### United States Circuit Court—District of Massachusetts.

PRINTING PRESS PATENT.—CYRIL C. CHILD vs. BOSTON AND FAIRHAVEN IRON WORKS.

[In Equity.—Before Shepley, Judge.—Decided January 1, 1873.]  
 Letters patent No. 98,037 were granted December 21, 1869, to Charles Montague, assignee to Cyril C. Child, the plaintiff, for improvement in printing presses. This invention consisted—

1. In the use of a vibrating lever for moving the type bed, constructed in two parts, one of which is made to slide out and into the other somewhat like the joints of a telescope, so that the upper end of the lever may be attached directly to the under side of the bed (dispensing with the use of a link) and move in a direct line with the bed, the upper portion of a rod, at the end of which is the lower portion, as the distance of the fulcrum of said lever to the point of attachment to the bed is greater or less in the different parts of the movement of the bed.

The plaintiff's claim is for the extensible vibrating lever in combination with a reciprocating type bed substantially as described.

Defendants admit the manufacture and sale of printing presses containing the extensible vibrating lever in combination with a reciprocating type bed, as described in complainant's patent.

The answer sets up in defense that Montague was not the original and first inventor, and also that the invention set forth in the plaintiff's patent had been in public use more than two years before the application of Montague. To sustain the defense of prior knowledge and use, respondents undertake to prove that one B. F. Leonard was the inventor. Leonard was in the employ of respondents as superintendent at the time that they made the first printing press of the kind claimed by the name of the "extension press," which embodied the invention of the extensible vibrating lever in combination with the reciprocating type bed. This press was made for Byington & Company, and was used in printing the *Norwalk Gazette* in the summer of 1867; and it is clear from the evidence in the record that Montague had conceived the idea of substituting the extensible vibrating lever for the lever and link connection previously used as early as 1865, and had made drawings of that year describing the invention. Although, from the opposition he encountered from respondents, who were then building his presses under contract with him, he did not embody his invention in a practical working machine until the press was made for Byington & Company in 1867, Leonard never seems to have claimed to have been the inventor of this improvement until January, 1869, when he represented in his caveat that he had made certain improvements in mechanism for operating a platen of a printing press, and that he was then engaged in making experiments for the purpose of perfecting the same. This caveat was prepared and made oath to, but never filed in the Patent Office. This was more than three years after Montague had exhibited to two or three persons his drawing representing his improvements, and a year and a half after the respondents had made for Montague the Byington press. The testimony is conclusive that this is only one more of the too frequent instances in which a person, engaged as an inventor or constructor in embodying an invention in a practical form, attempts to prove that he was the first inventor because he made or aided in making the first machine.

The judge held substantially as follows:  
 More than three years after the patentee had shown a drawing of his invention to several persons, and a year and a half after it had been embodied for him by the respondents in a working machine, a workman of theirs described it in a caveat, which was never filed, and this was held not to constitute the plaintiff's novelty.

An old combination employed in a new organization, and producing a new result by a new mode of operation, is patentable.

The plaintiff's patent was for a printing press in which an equable and regular reciprocating movement was given to the platen automatically by means of a lever driven by a crank, and having a telescope joint by which its length was accommodated to its position, and the patent was sustained, and, although the respondents sought to prove that the plaintiff's invention was forced back by a cam or die, and carried with it two levers of the same character, which compressed a spring or raised a weight, and this when released carried forward the lever and the lever the gage, the movement not being regular, and otherwise not suitable for a printing press.

The patent held valid also for similar reasons, although the patentee had for two years previous to applying for it manufactured and sold printing presses in which a reciprocating movement was given to the platen by a lever and crank mechanism.

The patent adjudged to be good and valid, and decree for complainants for injunction and account, as prayed for in the bill.

E. P. Broton, for complainant.  
 T. M. Stetson, for defendants.

#### NEW BOOKS AND PUBLICATIONS.

HUSSEY'S NATIONAL COTTAGE ARCHITECTURE, or Homes for Every One. By E. C. Hussey, Architect. Price \$6. Published by George E. Woodward, and sold by Orange Judd & Co., New York.

This work is a collection of sixty-three plates of pleasing and tasteful architectural designs for suburban homes, ranging from the modest cottage to ornate and handsome villas. The drawings are accompanied with full details, estimates of cost, hints as to construction, specifications, and enough general descriptive matter to enable the searcher for an appropriate plan for a projected dwelling to determine at once whether any in the pages before him will or will not meet exactly his requirements. A table of prices of building materials is added. The volume is elegantly printed on toned paper, and the plates are executed in the best style of lithography. Altogether, it is a useful and attractive book for residents in the country contemplating building. It seems to possess more originality in its designs than any work of its kind lately published.

AN ELEMENTARY COURSE OF PERMANENT FORTIFICATION. By D. H. Mahan, LL.D. Revised and Edited by Brevet Colonel J. B. Wheeler, Professor of Military and Civil Engineering, United States Military Academy. Price \$6.50. New York: John Wiley & Son, 15 Astor Place.

Professor Mahan's text books on civil engineering and field and permanent fortifications are so widely and generally known that it is unnecessary to allude to the volume before us, other than as a standard work of its

class. The reviser, in the new edition, has supplied several alterations and omissions in the original text, and made various necessary improvements. Prominence is given to the bastioned system over others, as it is considered as having best withstood the test of experience, and Nolze's method is carefully explained. The book is used for instruction at West Point. A large number of lithographic plates are supplied, together with the regular engravings in the text.

A TREATISE ON ASTRONOMY, SPHERICAL AND PHYSICAL, with Astronomical Problems and Tables. By William A. Norton, M. A. New York: John Wiley & Son, 15 Astor Place.

The fourth edition of this standard work appears in an entirely remodeled form, with many of its most important chapters wholly rewritten, and is, in brief, a complete exposition of the present condition of the science of astronomy from both a theoretical and practical point of view. The results of recent investigations concerning the physical constitution of the heavenly bodies are given in full, together with the author's own researches on the sun and the comets. A new and more accurate mode of determining the sun's parallax and mean distance from the earth is presented for the first time in an American treatise, and a description is also added of the astronomical observations for finding the latitude and longitude of a place ascertained by the United States Coast Survey. A number of valuable tables, together with several new illustrations, conclude the volume.

ART CULTURE, a Handbook of Art Technicalities and Criticisms, selected from the works of John Ruskin. Arranged and supplemented by Rev. W. H. Platt. New York: John Wiley & Son, 15 Astor Place.

As indicated by its title, this work is a compilation from the original and exhaustive writings on art criticism which have been given to the world by perhaps the greatest living art critic. It is intended for educational purposes, and aims to give the student a thorough appreciation, based upon the correct principles of a true and refined taste, of the handwork of the painter, the architect, and the sculptor. There is enough of the technical in the volume to render it a valuable guide to the artist, and many chapters notably those on color, light, perspective, sketching from Nature, &c., are eminently practical and clear in direction and precept. A profusion of admirable illustrations, mainly extracted from the complete works of Ruskin, are interspersed, and serve materially to elucidate the principles laid down in the text. A glossary of artistic terms and an alphabetical index of artists, sculptors, and architects referred to, are added. Press work and binding are alike excellent.

#### Recent American and Foreign Patents.

##### Improved Mole Trap.

Robert I. Huggins, Bethel, O.—To locate the trap, the earth is pressed gently down, so as to fill the burrow, and the trap is set directly above, with sill pieces parallel with the burrow, and with a cross piece on such depression. The mole, finding its hole obstructed, will commence repairing damages, and in forcing its body through the old track the cross piece will be raised, which raises a rod, and this, acting on a lever, releases a cross head which drops with its teeth on each side of the cross piece. The teeth penetrate the ground and spear the mole.

##### Improved Windlass and Crank for Brakes.

Henry M. Howard, Brooklyn, assignor to John Stephenson, New York city.—The windlass, around the lower end of which the brake chain is wound, is made polygonal, with the upper end reduced in size with a loose collar placed thereon, which is kept in position by a screw nut. The crank has two pairs of jaws. The former is made to fit two opposite sides of the windlass, and the latter are attached, by swivel pins, to the loose collar. By raising the outer end of the crank, the jaws will be detached from the windlass and the crank may be turned round to allow the jaws to engage with any other two of the sides of the windlass. By this means the driver is enabled to take a hold of the windlass that will allow him to exert the required strength to the best advantage. When the brake is not in use, as, for instance, when the car is reversed, the crank may be thrown over so as to hang out of the way.

##### Improved Sash Fastener.

John G. Spatheif, Sandusky, O.—This invention consists of a casing with bolt and lever arrangement, which catches into recesses of the window frame, and is withdrawn by pressure of the finger upon it, returning into the original position by a suitable spring. On releasing the button, the action of the spring will force the lever into the next recess, fastening thereby the window at that point.

##### Improved Road Scraper.

Thomas M. Tate, Longview, Texas.—This invention relates to means whereby road scrapers may be loaded with more facility, drawn with less expenditure of muscular power, and made to perform an increased amount of work in a given time. The invention consists in combining with a road scraper two front wheels, movable, to let them below or carry them above the bottom of scraper: in end-angled levers, having journals and fulcrum pivots combined with wheels and bearings in the sides of the scraper; in levers connected by a bar and combined with shoulders on scrapers, and a spring latch working therethrough: and in combining with the latch, held forward by a spring, a cross bar and arm of the latch lever.

##### Improved Lantern.

Joseph Kintz, West Meriden, Conn., assignor to himself and P. J. Clark of same place.—The object of the construction is to facilitate insertion and removal of globes and clamping or securing them between the base and top of the lantern. The vertical guards are hooked into the top through holes in the sides so that the top can swing sidewise. They are also hooked into the bottom in slots, so that they can move up and down in them to some extent. The guards are so adjusted as to length that, when down to the lower ends of the slots, the globe will rest on its seat and the top will rest on the globe, and when they are raised up in the slots as high as they will go, the top will swing off or on the globe. They are to be pressed down by inclines, formed by notching a ring which is fitted around the bottom of the lantern, and adapted to be reciprocated to fasten or unfasten the globe by acting upon the guard wires. The horizontal guards are connected to bent pieces, and the latter are arranged so that they will slip down on the vertical guards and hold fast at the bulge so as to hold the horizontal guards in place, and, at the same time, stiffen the bottom, globe, and top against lateral motion.

##### Improved Car Coupling.

Frank A. Markley, Waynesborough, Va.—This invention relates to car coupling generally, but more particularly to that class of them in which is employed a link with spring grapple at each end. The invention consists in pivoting the spring catches to the hook piece as nearly as possible in the same transverse median plane, in order to shorten the coupling link, and allow the cars to come as closely together as possible. It also consists in arranging a projection at one side of the rear concavity of link slot, so far as to arrest any lateral pressure of pin against the spring latch, and thereby prevent any chance of accidental uncoupling. It also consists in using slight side latches, and thus throw the main weight and strength of the metal into that part of the link which is expected to take the strain.

##### Improvement in Boots and Shoes.

James McMillin, Ripley, O.—This invention contemplates the use of a wedge as a remedy for the tendency which so generally exists to wear the heel of a shoe or boot on one side. If the tendency is to wear out the subjacent edge of heel on the inner side, the thicker part of wedge is caused to abut against the corresponding side of the upper, thus throwing the strain toward the center, and not only preventing the edge wear on heel, but tending gradually to correct a slovenly habit of twisting the ankle when the weight is pressing thereon in standing or walking. If the wear should be usually on the other side of the heel, the wedge piece is reversed in position, and is in like manner productive of the same result.

**Improved Apparatus for Unloading Corn from Wagons.**

Thomas Barron, Black Oak, Mo.—The parts of the bottom of the wagon box are attached to cross bars, so that the said bottom may operate as a single piece. One edge of the bottom is connected with the lower edge of one of the side boards of the box by hinges. To the bottom, near its other edge, are pivoted buttons, which may be turned into catches, attached to the side of the box to support the bottom in place. Upon the outer ends of the buttons are formed toes, to enter the forks of levers, which are pivoted to the side board of the box, and are connected so that they may all move together. One of the levers projects upward, so that it may be operated by the driver. Eye straps on the forward and rear parts of the side boards receive hooks attached to cross bars, to the centers of which are attached the ends of the ropes by which they are suspended. The ropes pass over guide pulleys pivoted to the beam attached to the frame of a corn house. The ropes are connected with a drum pivoted to supports attached to a sill of the frame. A drum is provided with a ratchet wheel and pawl to hold the wagon box suspended in any position to which it may be raised, and is operated to wind up the ropes by horses or other well known means. The upper ends of arms are pivoted to parts of the frame in such positions that a board may be swung beneath the locked edge of the bottom to form an inclined plane to guide the corn into the crib or bin as the locked edge of the bottom is detached and lowered.

**Improved Fly Trap.**

N. Barker McCreary and Henry L. Crist, Phelps city, Mo.—This invention is an improvement in the class of insect traps formed of an inner and outer wire gauze cage. The outer cage rests on the cross bars of a bait pan which is of sufficient depth and width to extend around the base of the cage, and admits easily the flies to the bait at the bottom thereof, from which they pass through cones into the upper chamber, where they are killed by hot water, heat, or other suitable means. A small door is hinged at one side, near the top part of the cage, and serves for the purpose of removing the flies without detaching the inner cage.

**Improved Sash Pulley.**

Moses Nelson, Eaton, Ohio.—The case of metal and made in two parts. It is inserted in a hole bored in the end of the stile, and incloses an enlarged wheel of such relative diameter as to allow the sash cord to project free from each side of the stile.

**Improved Potato Digger.**

Richard B. Evans, Connellsville, Pa.—A scraper removes the portion of the earth which covers the potatoes, leaving a corrugated roller suspended from the beam to act with good effect upon the smooth surface thus formed. A double or V shaped plow, following immediately after, is thus enabled to elevate the earth in which the potatoes lie embedded without injury to them, and with comparatively small expenditure of force. The roller also acts as a colter wheel, in respect both to the scraper and the plow, governing the depth to which they penetrate the soil.

**Improved Combination Lock.**

Arthur E. Pickle, Nevada, Mo.—This invention consists of a rotating plate, having a projecting pin at one end, which engages the locking bolt, so as to withdraw the same in part by means of the inner pin of a rotating dial plate acting upon a projecting band spring, attached to the rotating plate. The withdrawal of the lock bolt is completed by the action of a second pin of the dial plate on the bolt, which is recessed and provided with inclined front and rear projections for the same. The pins of the dial plate may be changed to any combination of letters by being placed into any two holes of the concentric series of perforations provided therein.

**Improved Winged Plow.**

Isaac A. Benedict, West Springfield, Pa.—This invention has for its object to improve the winged plow for which letters patent were granted to the same inventor December 13, 1870. To opposite sides of the standard are pivoted arms, to which braces, fastened to the rear side of the standard, are secured by bolts, which pass through short slots in said arms, so that the rear ends of the latter may be raised and lowered, as required. Wings are also secured to the arms, and may be expanded and contracted. The inward pressure upon the wings is sustained by a cross bar, the ends of which pass through longitudinal slots in the arms, and are bent into hook form. The brace bar is further secured in place by keys which rest in notches formed in the arms to prevent the ends of the brace from slipping when adjusted. Wedge wheels are interposed between the arms and the standard, so that, by turning them, the pitch and spread of the wings may be adjusted to suit wide or narrow rows, and turned down flat for shallow culture, or set up for hilling corn or potatoes.

**Improved Die for Forming Hammer Eyes.**

Henry Harrison Warren, Bridgewater, Canada.—The object of this invention is to furnish an improved means for forming the eyes of nail and other hammers, of the shape and style of the "adze-eye;" and it consists in constructing the dies with recesses or forming surfaces which will give the eye of the hammer blank the preliminary form necessary to the proper action of a punch or plunger employed to finish the eye.

**Improved Apparatus for Painting Broom Handles.**

John Reif, Kossuth, Wis.—This invention is an improvement in an apparatus for painting or ornamenting broom handles by means of bands or stripes, and consists in a series of strings or cords so arranged upon a frame that paint may be applied to them, and thus transferred to the broom handles when the same are subsequently rolled over them.

**Improved Feed Wheel for Saw Mill.**

John Kerr, Milltown, Canada.—The object of this invention is to produce a feed mechanism for saw mills, which will be absolutely regular, and equalize the movements of the saw carriage to such an extent that each cut or stroke of the saw will be equal to every other cut or stroke. The invention consists in the application of a friction shoe to the V shaped rim of the feed wheel, and in its connection with the operating mechanism in manner that will, when the shoe is drawn in one direction, cause the wheel to be turned, while the wheel will not be turned when the shoe is moved in the other direction.

**Improved Clamp.**

Jacob F. Schneider, Brooklyn, N. Y.—This is a strong and adjustable clamp connection for the several parts of wooden boxes or other objects where the parts are made detachable for the purpose of transportation and readjustment. It consists of two plates with bent edges, which are slightly inclined toward each other, and applied to the pieces to be connected. A plate with downward bent edges, with similarly inclined sides, is driven over the side plates, holding them rigidly together, and forming a strong connection of the parts.

**Improved Floor Clamp.**

Robert C. Davidson, Evanston, Wyoming Ter.—There is a plate for protecting the edge of the flooring, and a pawl for holding the clamp after clamping up the flooring. The connecting screw has a nut for adjusting the bar according to the thickness of the joist to which the clamp is to be fastened. A key is fixed in said screw to cause the nut and bar to shift together. Said key shifts along the screw with the nut and bar in a groove in the screw. A set of pointed stud screws is provided in the bars, near the connecting screw, for screwing into the joist to hold the clamp when it may be necessary to release a lower set of screws to shift them forward to get a new hold. In case the flooring is not clamped up sufficiently by the first operation. The bars are placed in the joist close to the edge, and fastened by the screws. The upper end of the clamp is then pressed forward, so as to press the flooring together by the plate.

**Improved Machine for Sprinkling Cotton Plants.**

William T. Robinson, Huntsville, Texas.—A two wheeled truck, of proper height and width, is arranged to run along above one row, and provided with a tongue to hitch on the animals, so as to go on opposite sides of the row. There is a liquid holding tank on the front part of the frame, which has a sprinkling tube, of suitable size for sprinkling the liquid upon three rows of cotton. Behind the truck is a horizontal shaft, extending each way beyond the wheels, for reaching over the outside rows, and carrying revolving sleeves for sprinkling on powdered substances. By suitable arrangement of the mechanism, the plants are first dampened with water and then overspread with poisonous powder, the former causing the latter to adhere to the plant.

**Improved Bung Bush Inserter.**

Lomax Littlejohn, New York city.—The object of this invention is to improve the bung bush inserter for which letters patent No. 138,568 were granted to the same inventor May 6, 1873, to make it impossible to burst the bush, however much power may be applied. By suitable construction, when a sleeve has been inserted in the bush, and a shank turned, an elliptical journal will expand the sleeve, causing it to grasp the bush firmly, and screw it into the bung hole in the stave. In case the stave is hard, and considerable power is required to force the bush into place, the powerful expansion of the sleeve will sometimes burst or split the bush. To remedy this, a tongue is attached to the elliptical journal, which enters a slot in the sleeve, which strikes against the side of a shoulder of said slot, and thus turns the bush, the said tongue and slot being so arranged that the sleeve will be expanded sufficiently before the tongue strikes the shoulder of the slot.

**Improved Apparatus for Manufacturing Illuminating Gas.**

John G. Miller and William Miller, Dayton, O.—The gas retort, of cast iron, is placed longitudinally in a furnace, which is constructed of fire brick, in the usual manner. Coal oil is fed to the retort from a tank as the formation of the gas progresses. The retort connects, by a conical neck and pipe, with a hydraulic valve. The gas, which is formed after the retort is at red heat, passes up through the bottom of the valve. The mouth of the entrance pipe has a conical cap, which is open at the bottom and placed in water, through which the gas is forced and cleaned from the tar vapors. The top part of the valve is made airtight by being placed with its lower end in tar or other fluid, on the outer casing of the valve, as usual in gas factories. The gas passes then from the valve to the purifiers, which are filled with coke, and thence, by a hydraulic valve, to the gasometer.

**Improved Music Leaf Turner.**

William H. King, Petersburg, Ind., assignor to himself and Jerome Borer, of same place.—The object of this invention is to provide an improved music leaf turner for sheet and book music, by which the leaves are readily turned as required during the playing of the instrument, and firmly retained in position on the rack or stand, whether they are placed singly or in book form thereon. The invention consists of a frame which is attached by its base piece to the rack of a music stand or piano. Upright connecting bars are pivoted to the base piece and top piece, by means of which the latter is adjusted parallel to the base piece and the supporting bottom bar of the rack. The top piece is slotted for the arms, which are pivoted to a common center pin, and applied by flat end wings to the sheets to be turned by a sliding plate, which catches by staples and slots into the forked ends of the arms. The sliding plate is drawn from side to side by cords and pulleys connected to a knob on the base piece.

**Improved Wheel for Vehicles.**

Frederick H. Brinkkötter, Quincy, Ill.—Flanges rise out of the surface of the hub cylinder at a considerably greater distance from each other than the breadth of the spokes, and incline toward each other for the greater portion of the distance to the periphery. Near the outer edges they make a short turn directly toward the spokes, and for the rest of the distance they are parallel to each other, and have a flange on the inside, and form a dovetail shaped annular chamber, in which are collars of wood, divided in two parts, for putting them in. They are coated with white lead, to prevent them from shrinking, and the spokes are driven in so as to wedge tightly all the way to the bottom. The inside of the hub and also the exterior of the box are provided with short spiral ribs, near each end, to lock the box against end motion, by turning it after it is inserted in the hub, so that the ribs bear against each other; and near the outer end of the box is an annular ring, against which is a leather washer, to pack the joint tight by a flange of a nut. The wheel is placed down, with the inside of the hub up, the box centered at that end, and the space finally filled with melted sulphur.

**Improved Earth Closet.**

John L. Young, New York city.—A hinge is attached to the cover and to the casing, by means of which the service pan and shutters are operated, and which consists of a bar which is attached to the edge of the cover, having a branch thereon. Connected with this is mechanism so arranged that, when the cover is raised, the service pan is carried forward beneath the seat, taking with it a layer of earth equal in thickness to the width of the discharge mouth. The excrement falls upon this layer of earth. When the cover of the seat is closed, the pan is drawn back, and the contents of the pan are deposited in the tub beneath. The thickness of the layer of earth on the pan may be of any width. The shutters are two pieces of metal, with their ends turned at right angles and pivoted to jambs, so that they will fall and close together by their own gravity. They are opened, when the cover is raised, by means of the turned up edges of the service pans, which strike cranks, which raise the ball as the pan is carried forward. The hinge is of such peculiar construction and so applied that the shutters are neither opened nor closed until the cover is thrown almost back against the front of the hopper.

**Improved Plane Guide.**

Walter S. Shippe, Minerva, O.—This invention relates to an improvement in plane guides, by which the plane is steadied, in squaring or beveling, to any desired angle without the use of a try square or bevel; and consists of a yoke, which is firmly applied to the plane, and provided, at one end, with a pivoted guide strip, which is adjusted, by clamping screws, under any required angle to the plane.

**Improved Sugar Manufacture.**

Herman M. Aschenbrenner, Havana, Cuba, assignor to himself and Theophilus Masac, same place.—The juice passes from the grinding mill into a conveying tank with two sets of filters, which operate alternately. The conveying tank discharges into the flannel filter, and the juice falls into a tank which has three outlets corresponding with three open kettles. In these kettles, in successive order, the cane juice is precipitated, by means of lime and magnesia, and the sediment is drawn off. Thus purified, the juice passes through the siphons into the last filter, and then, by the suction pump, is forced into the sulphur box. This box, of wood, has inside a paddle wheel, worked by the steam engine of the mill, and is fed with sulphurous fumes from the adjoining sulphur furnace. The juice leaves the box in a perfectly bleached condition, passing upon a metallic box of sheet metal, heated inside by steam, and serving to raise the temperature of the juice to not over 90° centigrade, by a condensation of 32° to 33° Baumé. There it goes into a communicating canal, upon the inclined plane, also heated by steam and provided with an outlet, and finally is acted upon by a blast from a steam fan placed at the lower end of this inclined plane. The juice becomes now so thick that it has to be scraped with the slowly revolving scraper, which is constructed like an endless apron, provided with suitable scraping blades, and actuated by power transmitted from the engine. There is another smaller and more inclined plane, similar to the former one, and also fanned by another fan, from which plane the sugar, already crystallized, is scraped off, by hand or otherwise, into the final receiver. A complete description and illustration of this invention will be found on page 367, vol. XXIX., of the SCIENTIFIC AMERICAN.

**Improved Package for Caustic Alkalies.**

Henry B. Hall, New York city.—This invention relates to the caustic alkali package, consisting of a spun or stamped metal cup, with a hermetic cover of resin and wax or the like material, formed by pouring a gummy substance, in a melted state, over the alkali, with which the cup is filled; and it consists of a metal disk or cover of tin or other suitable substance put in before the gummy sealing material is put on, and made to spring into a small groove in the inside of the cup near the top. The object is mainly to utilize gummy sealing matters or compounds for closing metal packages containing broken caustic soda. The sealing substance cannot well be used without said metal cover, in consequence of its settling down in the spaces between the pieces, and cementing them together, causing considerable waste, besides interfering with the use of the soda.

**Improved Pen Wiper.**

Hugh S. Ball, Spartanburg, S. C.—This invention consists of two sponges held in suitable metal cups affixed to the ends of bent lever arms. The latter are so connected with a suitable standard and with each other that when the pen is tightly pressed upon the lower sponge, sufficient force is exerted to bring the upper sponge down upon it, so that both sides of the pen are thereby cleanly wiped.

**Improved Farm Gate.**

David A. Neidig, Paris, O.—This invention is an improved gate for self-closing and self-latching, and answering the purposes of a small farm gate for the passage of persons on foot and horseback as well as those of a large farm gate. The gate works easily and conveniently, is cheap and durable, and lifts clear above the snow. When the gate is closed, a supporting rail extends through its full length, and rests with a semicircular notch on the pulley of the main post. When pushed open to the side, the gate slides on the supporting and inclined rails, and, being self-closing and self-latching, into its former position. When it is desired to keep the gate open for ordinary purposes during the day, it is pushed back till it rests on a long notch on the inclined rail, which raises also the forward end of the supporting rail, and locks it into the top of the main post, bringing the gate to a level. In this position the gate cannot be swung around, and in order to do so, so as to make room for a load of hay or other bulky substance, it is necessary to push the gate into a second or shorter notch, which causes the forward end of the supporting rail to drop into a semicircular recess, from which position it can easily be lifted and, the gate being properly balanced, swung around.

**Improved Can for Transporting Oil, etc.**

James E. Pimley, Newark, N. J.—The ends of the cover extend down and overlap the sides of the body, and are fastened by screws put in so that they can be taken out readily, to remove the cover altogether while the contents are being drawn from time to time for use. A tapered nozzle is constructed without a bead at the top, so as to secure a tapered cap, which is provided with an annular groove, to fill with plaster of Paris or other cement in a plastic state when the cap is put on for sealing it up tight. The cement is broken loose by a few taps with a small hammer or other instrument when it is to be taken off. There is a funnel around the vent hole, to hold the cement for sealing the vent for transportation.

**Improved Wire Stretcher.**

Isaac H. Congdon and Jacob E. House, Omaha, Neb.—This invention consists in the mechanical application of an iron frame and rollers for the purpose of adjusting or giving a uniform and constant tightness to the iron wire used in the construction of wire fences. The rollers are of hollow cylindrical shape, secured in suitable frames on either side of a post, and are provided with flanges in which are holes for the insertion of lock pins, which prevent the rollers from turning back after the wire has been tightened. The wire is attached by its end to one roller, and is adjusted thereon by a crank handle, which is carried by the attendant from post to post, so that very extensive fences can be easily set as desired.

**Improved Fountain Pen.**

Henry N. Hamilton, White Plains, N. Y.—The handle of the pen is made hollow, and is tapered at its lower end. In the inner surface of the upper end of the handle is a hollow screw plug, with a closed lower end, and with a hole through its side. Secured to the screw plug is a rod which extends down to the tapering part of said handle, and has a valve to fit into the lower part of the cavity, so as to prevent the outflow of the ink, unless the rod and valve are slightly raised. A nut, which is screwed into the hollow screw plug, is perforated from its lower end, from the upper end of which a perforation leads out through the side of said plug. By turning the plug up a little, the valve is raised from its seat to allow the ink to flow out. The nut is then unscrewed sufficiently to bring its side perforation above the plug, so that the air may pass in to cause an outflow of the ink.

**Improved Sugar Cane Cultivator.**

Henry Von Phul, Jr., and James Mallon, Holly Wood, near Baton Rouge, La.—The mold board is hinged to a standard and the land side. The land side produces, with the mold board, the shape of a slanting V. The position of the mold board and land side is regulated by a curved lever which is pivoted to a supporting bar of the land side, and connected by a pivoted bar to a projecting lug of the mold board. For expanding the fluke to its largest width, the handle end of lever is locked by a pin, through a hole near its handle, into a hole of a projecting bar of the land side. By suitable means the width of the fluke may be contracted as desired.

**Improved Velocipede.**

George Avery, Ottawa, Ill.—The rear axle is provided with a crank for each pedal bar, which are so arranged that the bars are made to act alternately upon the axles, the weight of the driver being first thrown upon one bar and then upon the other. The power is applied when the cranks are in a horizontal position, when the weight will have the greatest effect. The arms of the steering lever are attached to the forward axle. The frame rests upon the axle at the rear, and upon the bolster in front, the forward axle being bent to allow the bars to play. The bars are jointed to the forward end of the frame, and foot pieces are on each of the bars, one each side of each joint. The driver stands upon these bars, with his feet on the foot pieces, and propels the machine by throwing his weight first upon one bar and then upon the other alternately.

**Improved Ore Washer or Buddle and Ore Separator.**

John Collem, Idaho Springs, Col. Terr.—The first invention is a revolving buddle. The finely crushed ore, consisting, for instance, of quartz, copper pyrites, iron pyrites, and galena, is conveyed by water through a suitable spout into the distributing box, from which it passes through small holes, and spreads itself uniformly upon the surface of the table, the heavier minerals settling mostly near the center, and the lighter near the periphery but still in a mixed condition, as the separation caused by the running water is only very imperfect. As the table revolves the minerals are subjected to the combined action of the clear water from the distributing box, and the stirring of the brooms, which causes the quartz and other light earthy matter to pass to the periphery of the disk, and then to fall into a suitable receptacle; while, owing to the jarring action of the pounders and the greater density of the other minerals, the latter still remain on the buddle. The copper pyrites, and then the iron pyrites, being subjected to the action of the other brooms and larger quantities of clean water, are each passed to the circumference, and deposited in separate receptacles. The galena still remaining on the table may be removed by other brooms or scrapers, or be washed off by strong jets of water. The same inventor has also patented an improved ore separator which consists of two or more grading sieves in the upper portion of a tank of water having appropriate discharge passages for different grades of material escaping. These are actuated in the water by suitable mechanism, and also have a washing attachment so arranged that currents of water are caused to flow upward against the descending currents of ore. The "slime" water is thus separated from the coarser particles, and caused to flow, with the fine particles of ore, into another tank, in which is a siphon pipe adapted to collect that which is sufficiently heavy to settle to the bottom of the water in said tank and convey it to a proper receptacle.

**Improved Station Indicator.**

John W. Newlin and Jacob S. Stimmerman, Millville, N. J.—This invention is an improved station indicator for railroad cars, so constructed that the indicators throughout the train may all be adjusted at the same time. The front of a rectangular box has a transparent portion in its middle part, to allow the names of the stations to be seen. The names of the stations are printed upon strips of wood. The upper parts of the strips have hook-shaped slots. Vertical pieces are attached to the top of the box, and to their lower inclined edges are attached metallic straps, in such a way as to form inclined slots. Other pieces with upper edges inclined to the rear are attached to the bottom of the box, and their forward ends extend close up to the door. The lower edges of the strips incline downward. A shaft, which works in bearings attached to the box, carries three arms. The first arm projects downward into such a position as to strike the clapper of a bell. The second arm, when moved forward, strikes against the end of the lowest name strip, and pushes it longitudinally until it drops upon the inclined edge of the lower vertical pieces, down which it slides to the rear part of the box. The third arm passes out through a slot in the end of the box, and has a pulley pivoted to its end, to receive a cord which is kept in place upon the pulley by a spring which allows the cord to be slipped off and on conveniently. The cord extends through all the cars of the train. When the cord is pulled the effect is to raise all the arms, which strike the bells, and push the lowest strips from their places and expose the next strips. When the end of the route is reached, the strips will all be upon the lower vertical pieces, and arranged in proper order for the return trip, so that all that will be necessary to rearrange the indicators will be to raise the strips, and hang them upon the straps of the upper pieces.