flying of the devoted man as the reader has occupied in reading these last few lines describing it. From the instant of the disaster to the balloon till he struck the ground, the time was not probably more than fifteen seconds, as measured off on the watch dial by the second hand. At a hight of five or six hundred feet from the earth, the unfortunate man got separated from the basket—in fact it appeared as if he leaped from it intentionally. This certainly made no difference as to the fatality of the fall. The concussion must have killed him just as quickly had he struck the earth with the basket beneath him. Wonderful as it may seem, from the time he sprang from the basket his position in the air remained erect, feet down, till he struck, notwithstanding the greater weight of the head and body, which causes most human bodies to turn and fall head first. It is possible he had acquired a faculty of controlling his position in the air by athletic force. Perhaps, in the hurried thoughts of despair, he fancied he might, by striking feet down, be spared from death. But the indescribable swiftness of his descent must have knocked the breath out of him, even had he struck on a newly made hay stack. Many people declare that they saw such movements of his limbs and even expressions in his face as showed him to be alive and conscious until he struck. But this is considered by the greater number to have been entirely improbable. His shooting downward through space with lightning-like swiftness deprived him of all breath and sense of life, undoubtedly, while part way down. Indeed, it is hardly possible that he intentionally jumped from the basket. It is more likely that he fell from it when he had no longer any power to hold on to it. With terrific violence he crashed upon the earth, feet down, his legs being driven up into his body, and all but his head instantly mashed into a sickening, quivering mass of spouting blood, protruding bones, and dropping flesh. His feet struck into the earth several inches. He struck a few feet from the jail wall, only about eight rods from the very spot where he went up. Down came the basket right after him, and his hat came wavering down. What became of the sack of the balloon is not known."

La Mountain's name is familiar to the readers of the SCIENTIFIC AMERICAN. He was the hero of many a remarkable balloon ascension, and had great confidence in his abilities to navigate the air. But it is evident that he was careless, in the present instance, in respect to the mechanical details of his air ship, and the loss of his life is the sad result. La Mountain was one of the party who accompanied Professor Wise in his famous aerial flight from Missouri to New York in 1859. On that occasion, La Mountain narrowly escaped drowning in Lake Erie.

Action of Water on Lead.

The most general results of Sir Robert Christison's inquiries are: 1. That the purest waters act the most powerfully on lead, corroding it, and forming a carbonate of peculiar and uniform composition. 2. That all salts impede this action, and many prevent it altogether, some of them when in extremely minute proportions. 3. That the proportion of each salt required to prevent action is nearly in the inverse ratio of the solubility of the compound which its acid forms with the oxide of lead.

The corrosive action of water upon lead has often been confounded with other causes of corrosion, and the water has borne the blame. Thus the true action has been confounded with the corrosive action of potent agents accidentally coming in contact with the metal in the presence of water, as, for example, when a lead pipe has been led through fresh mortar, which is frequently or permanently kept moist, or when lumps of fresh mortar have been allowed to fall upon the bottom of a lead cistern.

The true or simple action of water has not unfrequently been confounded also with the effects of galvanic action. Thus, if a lead pipe or cistern be soldered with pewter solder and not with lead, erosion takes place near the line of junction of the solder with the lead. The presence of bars of other metals crossing lead, or bits of them lying on it, will also develop the same action; and some facts seem to point to the same property being possessed in a minor degree by some stony and earthy substances. This observation may explain the local erosion sometimes observed in cisterns containing hard water; since, if galvanic action be excited, it will be increased by the fact of saline water existing more largely in these waters than in soft or comparatively pure water.

Lastly, some observers have contradicted former statements, because under certain circumstances, which led them to anticipate no action, they nevertheless found lead in water, but only in extremely minute and unimportant proportion. The test for lead, hydrosulphuric acid, when employed in the way now usually practiced, is so delicate as to detect that metal when dissolved in ten million parts of water, or even more. Facts, however, warrant the conclusion that the impregnation must amount to at least ten times this quantity before water can act injuriously on man, however long it may be used.

Tin as a Filling for the Teeth.

Dr. E. W. Foster, in *Dental Cosmos*, says: Tin possesses many considerations of fitness for stopping carious teeth not held by gold. Its freedom from being suddenly affected by thermal changes, its plasticity and ease of adaptability to all the irregularities of the cavity, its permanency or stickiness in the cavity, its comparatively low specific gravity, and other favorable features, are some of the prominent facts connected with this really fine metal, that make it no mean competitor with gold in the daily and important question of filling and preserving the teeth. The prejudice of most operators is generally, we well know, against this foil, and from grounds we think not entirely reasonable.

We have occasion to use it much in our practice, sometimes for permanent fillings, and sometimes to precede gold in the soft vascular teeth of children and youth. As to the extreme permanency of tin when removed from the attrition of mastication, it will be difficult to determine. Yet we have seen tin fillings between thirty and forty years of age, still serviceable and in good condition.

The low specific gravity of tin, and its non-irritating nature, resembling in the latter trait, though in a less degree, the same remarkable quality possessed by lead, enable it to rest with comparative non-disturbance even in the midst of vital presences.

For this reason lead had long ago been used for filling teeth in many countries of Europe. In France especially it was the material *par excellence* for such purposes; and it may not be uninteresting to remark, that the very word in the French language used to signify the term "filling teeth," is *"plomber,"* a word of historical significance in this connection, being derived from the name and the fact of lead being used as a stopping for teeth, even so far back as the formation of that language.

Though tin is easier of manipulation than gold, the same care, to the same end, should govern its introduction into the cavity, its condensation and finish afterwards. If the cavity is large, and nerve nearly exposed, the use of polish-powder (oxide of tin) moistened with water or glycerin, and applied to the walls of the cavity before the introduction of the tin, will produce agreeable and substantial results.

Cornell University.

The attention of our readers is called to the commencement of the above well known institution published in our "Business and Personal" column. The next scholastic year begins on September 8, so that ample time is afforded between that date and the present, for those desirous of availing themselves of the advantage of the various courses, to make all necessary preparations. Young mechanics, engineers and students in the various professions and trades will find no institution in the country better adapted to give them a sound, practical as well as theoretical, basis for their future callings than Cornell. Five hundred free scholarships are in existence, and the college is liberally endowed with every requisite for thorough and systematic instruction.

Inventions Patented in England by Americans.

[Compiled from the Commissioners of Patents' Journal.]

From June 20 to June 26, 1873, inclusive.

BRAIDER.—E. H. Alexander, New York city.
EXTINGUISHING FIRES.—J. W. Stanton, Brooklyn, N. Y.
GAS.—J. H. B. M. Randolph *et al.*, Detroit, Mich.
PICKER MOTION.—T. C. Morton, Waterbury, Conn.
PRESERVING MEAT, ETC.—A. T. Jones, Clinton, Wis., *et al.*
PRESERVING WOOD.—C. Brown (of Albemarle, Va.), London, Eng.
PRINTING OIL CLOTH, ETC.—W. H. Townsend, New York city.
SEWING MACHINE.—Lev Griswold, New York city.
STEAM BOILER.—J. Griffith (of New York city), London, Eng.
TREADLE.—S. K. Herrick, Boston, Mass.
TUNNELLING.—D. C. Haskins, Vallejo, Cal.

Recent American and Foreign Patents.

Improved Relisher and Wedge Cutter.

Wesley J. Hoskins and Amos D. Rowe, Essex, N. Y.—This invention consists of a combination of instrumentalities whereby the relish of a door rail may be cut, and the part to be removed may first be cut into wedges and then removed by a succession of operations, all of which are performed with one machine. A gang of three saws cuts three parallel slits on the swinging frame which is connected to a tilting table. Over the saws are mounted the two saws for cutting the diagonal slots on an arbor. In front of these the stationary cutters are arranged for cutting out the relish. In the first place, the rail is put on the table and moved along one of the guides, properly adjusted therefor against the saws, till the shoulder of the rabbet comes against a stop by which the saws cut a slit; then the table is tilted upward by a handle, without moving the rail from its position on the table, to other saws which make the diagonal cuts; from the saws the work is moved up to the cutters above; then the treadle is forced up and the wedges are cut off, leaving the relish, and making the wedges complete.

Improved Corn Harvester.

James H. Spears, Kennedy Wells, and Robert Wells, Piper City, Ill.—This invention has for its object to furnish an improved machine for detaching the ears from the stalks, removing the husks from the ears, and depositing the husked ears in a wagon. To a cross bar are attached the ends of the shanks of the three guides or gatherers. Rollers are arranged parallel with each other, in pairs, and upon the opposite sides of the shank of the central guide. These rollers have corrugations upon their lower or forward ends, the corrugations of the rollers of each pair running in opposite directions, and extending longitudinally along the upper or rear part of the said rollers. To the rear journals of the rollers of each pair are attached small gear wheels, meshing into each other, so that the rollers of each pair may be revolved together with equal velocity and in opposite directions. The journals of the inner rollers are extended to the rearward, and connect by gearing with a shaft on which is a roller. An endless carrier passes around a roller pivoted in a slot in the lower part of the shank of the central guide and around the roller attached to the shaft, and by which the said carrier is driven. The carrier receives the ears of corn from the rollers, carries them up and discharges them into the inclined spout, down which they slide to other rollers which are provided with short teeth arranged spirally, which tear off the husks from the ears, and at the same time carry said ears along and discharge them upon the elevator, which passes around rollers pivoted to the upper and lower ends of the elevator frame and discharges the husked ears into a hinged spout, down which they slide into a wagon.

Improved Medical Compound and Medicated Food.

Jean M. O. Tamin, of New York city.—This invention consists in extracting from vegetable substances those most nourishing ingredients which are combined with phosphorus, and in subsequently adding them to the substances to be eaten or imbibed as articles of food or medicines. Thus, for example, it is proposed to withdraw from vegetables, such as peas or beans, the ingredients above referred to, discarding the indigestible, or at least with difficulty digestible, residue of such vegetables, and to add the matter extracted to chocolate or other suitable article of food. A certain quantity of peas, for instance, is powdered and then treated with water. The mixture is filtered, and so much of the moisture is evaporated as to leave the remainder of a more or less viscid consistency. Gastric juice or finely cut pieces of a calf's stomach are next added. Finally, the mixture is dried at a moderate heat. The substances with which the phosphorus is thus mixed it is proposed to call "phosphorine."

Improved Washing Machine.

James W. Hannah, Sticklerville, Mo.—This invention has for its object to furnish an improved washing machine. The body of the machine is made semicylindrical in form, having vertical wooden ends and curved zinc bottom and sides. In the middle part of the ends of the box, leading downward from their upper edges, are formed vertical slots to receive the journals of the rubber, the ends of which enter grooves in the vertical bars or standards attached to the outer sides of said ends. To the inner surface of the bottom and sides of the box are attached round cleats. The end plates of the rubber are made semicircular in form and are connected and held in their proper positions by the cross rounds. To the rounds, at equal and short distances apart, are secured the concave edges of segments of ring plates. To the end plates and shaft are attached levers, the upper ends of which are connected by a round which serves as a handle in operating the rubber. By this construction the plates, being vertical, pass easily through the water and without carrying the water with them, which makes the labor of operating the machine very slight, and, at the same time, the scalloped edges of said plates, operating upon the clothes, clean them in a very short time.

Improved Animal Trap.

John Gould, Clinton, Pa.—This invention has for its object to furnish an improved animal trap, which shall be so constructed that the entrance of the animal will reset the trap for the next animal. By suitable construction, when the trap is set, as the animal enters the box and steps upon a platform, he tilts said platform, which draws back a catch lever and allows a wheel to be revolved by a spring until a pin, upon the other side of the wheel, strikes a stop spring. This movement closes the doors and leaves the animal shut up in the box. The animal then sees light entering through another box, and, trying to reach it, he raises a gate, steps upon and operates the trip platform, and passes into a third box whence he cannot escape. This movement withdraws the catch lever and allows the wheel to revolve until the next pin upon its other side strikes against the other stop spring, opening the doors and again setting the trap.

Improved Knapsack.

George H. Palmer, first Lieutenant 16th U. S. Infantry, Beloit, Wis.—In this invention the frame is made of small, tough, flexible pieces of wood, butted together at the end and secured at the corners by strong duck, canvas, or other heavy cloth, in which the sticks are bound at the edges. Between the sticks are strong thick pieces of leather fastened to the cloth and turned around the corners. They are to hold the sticks apart the width of the cloth pieces, and to afford sufficient strength for holding the covering and the straps, which are attached to them. About half an inch from the end the wood pieces are tied together by strong leather strings. The cloth pieces of each corner are connected together by straps which prevent them from sliding up on the rods, and bind the frame strongly together at the corners. The cover, of flexible material, is shaped so as to envelope all sides except one, and, having flaps, is fastened on by metal loops with a toggle piece, the said loop being inserted through the canvas and leather corner pieces; and the flaps are provided with means of buckling together when folded down. The lower loop straps also unite with the straps, the said straps passing through the metal loops and meeting and buckling together at the middle of the bottom of the knapsack. The loops are connected to the knapsack by the metal loops, that they can be readily shifted as may be required for changing the knapsack sides about. The shoulder straps are connected to the back plate by rivets, which are suitably arranged to allow the straps to turn freely as required in separating and adjusting them on the wearer, also for shifting them about to different positions for ease in sustaining the load. The knapsack frame is covered with linen or cotton duck, having on one side a waterproof flap of vulcanized rubber cloth. It may be reversed on the back by simply hooking it from the back pad, turning it, and changing the supporting straps to the opposite side. By this means the canvas back may be turned outward in hot weather, and the waterproof flap outward in rainy weather. The knapsack may be worn at almost any place desired on the back.

Improved Friction Attachment for Securing Pulleys to Shafts.

Henry Cox, Peterborough, Canada.—The invention consists in the improvement of friction attachments for pulley shafts. A shaft carries a loose pulley in the hub of which is formed a mortise, at the sides of which are formed one or more lugs to receive a pin by which an eccentric disk is pivoted to said hub. By this construction, when the pulley is turned in one direction it will run freely, but when turned in the other direction the eccentric will take hold of the shaft and carry it with the said pulley in its revolution. This secures the pulley on the shaft or prevents its retrograde motion.

Improvement in the Manufacture of Zinc White.

Nathan Bartlett, of Bayonne City, assignor to himself and Samuel C. West, Elizabeth, N. J.—The furnace has three chambers, an upper, middle, and lower one. The fire is built at one end and delivers the lighter vapor into the upper chamber and the heavier into the middle chamber, the latter vapor passing out at the chimney, while the former, after traversing the length of the furnace, descends in two passages to the lower chamber, where, after having twice traversed the whole length, it enters the discharge chimney. This improvement in the arrangement of the furnace consists in making the middle chamber funnel-shaped, or approximately so, by which to concentrate the heat, as before stated, and thus work out the oxide from the ore much cleaner than it has ever been done before, and thus increase the percentage of gain. In carrying out this improved mode of working the furnace the chamber is in four imaginary sections. When fully heated and charged a batch of the residuum at the opening and the three other batches are shifted along one stage, and a fresh batch applied, thus working the ore along intermittingly as the reduction proceeds, and at the same time supplying the fresh ore and removing the refuse without cooling the furnace down or losing the time now lost by discharging at the mouth of the furnace and recharging again, the doors remaining open the while so that much heat is lost. For introducing the oxygen to combine with the gases evolved from the coal in the furnace, also the vapors of the ore, and thus to insure more perfect combustion, two blast pipes discharge into the chamber, so that the air, which is forced in by any suitable blower, unites with the gases as they emerge from the passages and burns intensely.

Improved Horse Power.

Joseph Milbourn, Millport, Ohio.—The object of this invention is to improve and render more useful the horse powers which are used for thrashing grain, and other purposes; and it consists in adjustable extension levers, in combination with the old or ordinary levers, and in stay rods which connect the ends of the extension levers, and in draft rods attached to the stay rods. There are but two draft rods, but there may be a draft rod for each lever, if desired. By this arrangement the draft is applied to the ends of the extension levers, which results in a great saving of power.

Improved Washing Machine.

Nathan F. Reed, North Wolcott, Vt.—This invention has for its object to furnish an improved washing machine. A set of rollers, the journals of which revolve in bars of such a size that the rollers work clear of the bottom of the box, form a roller bottom to said box. A second set of rollers, the journals of which revolve in bars which are made shorter than the bars above mentioned, are connected by boards, thus forming a roller platform or rubbing board. To the sides of the middle part of the platform are secured staples upon which hook notches are formed in the lower ends of bars which are pivoted to levers. By this construction, by moving the upper ends of the levers back and forth, the roller platform will be moved back and forth, rubbing the clothes between it and the roller bottom, washing them quickly and thoroughly. By suitable means the roller platform may be held down upon the clothes with any desired pressure.

Improved Implement.

Henry B. Whitehead, Holly Springs, Miss.—This invention relates to an improved tool for use as pliers or as a hand vice; and consists in an arrangement of jaws having perpendicular toothed shanks, and transversely slotted handles provided with teeth on their pivot ends for engaging with the jaw shanks, whereby a parallel motion of the jaws is produced. By tightening a thumb screw the jaws may be set and used as a hand vise. The handles when used as calipers and dividers, and opened to the desired angle, are thereby held in position. When the handles are thrown out as far as the frame will allow, the jaws may be moved one or two teeth, and can then be used to gripe larger bodies than in the former state.

© 1873 SCIENTIFIC AMERICAN, INC

Improved Medical Compound for Liver Diseases.

Joseph M. Cunningham, Mount Morris, Ill.—The object of this invention is to supply an efficient compound for diseases arising from a deranged condition of the liver and complaints having their origin therein. It consists mainly in extracting with alcohol the bitter part of different roots and herbs, to be mixed, after percolation, with water, sugar, and the oil of sassafras.

Improved Railroad Crossing.

Robert J. Hughes, Ryneer, Ind.—This invention isan improvementin the class of switches or railroad crossings in which the rails of the side track are elevated to allow the wheels of the cars to pass above the rails of the main track. The cross ties are placed higher than usual to reach the level of the crossing rails, and are placed nearer together at the switch. They are suitablynotched for the reception of the main rails, to keep them on the level of the main track. The crossing rails are placed on the elevation of the ties, and are thereby raised above the level of the main rails. Between the rails of the main track is laid the pivoted or springrail, the end of which is curved from the main rail, and, by suitable means, is prevented from being lifted off the track. The flanges of the wheels pass between the main rail and spring rail by pressing the latter sidewise. A flange plate is placed on a level with the top of the main rail adjacent to end of the spring rail and serves the purpose of conveying the flanges of the car wheels from the spring rail to the raised side rails. The guide rail placed opposite the flange plate, on a level with the crossing rails, assists the wheels to pass over the flange plate to the side track.

Improved Presser Foot for Sewing Machines.

George W. Allerton and Zenas M. Powers, Robinson, Ill.—This invention consists of a glass disk pivoted to the supporting arm in the axis of the needle by a hollow pivot through which the needle works, the object of which is to have the presser turn with the work when curved seams are to be made, so that the work can be turned more accurately and easily than it can be with the ordinary non-turning foot. A rotating presser of this kind is very useful in equalizing the length of the stitches, by the facility it affords for turning the work accurately.

Improved Peach Cutter.

William J. Hill, Fayetteville, Tenn.—The invention consists in the improvement of peach cutters. In using the machine the peaches are laid blossom end downward upon cutters, with one hand, in such a position that the seam of the peach may be in line with the wing or straight cutters, and a lever is operated with the other hand to bring a block down upon the peach. As the block presses upon the peach with sufficient force to hold it in place, the first hand is removed from the peach and the block is pressed down upon the edges of the cutters, the parts of the peach dropping into the spout, and the pit sticking in the cavity of the cutters until it is pushed out by the next pit.

Improved Scaffold.

Daniel Y. Miller, Huntsville, Ill.—The object of this invention is to construct a scaffold for the use of painters, carpenters, and others, which may be easily set up and taken to pieces and readily transported. The invention consists of two main supports resting on standards and composed of several pieces, connected by strong staples, the uppermost pieces suspending, by block and tackle arrangement, an adjustable platform, which may be elevated to the full hight of the supports.

Improved Cotton Planter.

George Paterson, Waynesborough, Ga.—This invention consists in the improvement of cotton planters. Behind the plows are the guano hoppers, supported on iron rods or bars, or other supports, adjustable toward or from the frame. Vertical slides are arranged in the hoppers with pockets to fill with the guano as they rise up in the hopper, and carry it down to discharge below. Said slides are pushed down by tappets on the seed-dropping wheels, and they are forced up by a spring, when the tappets escape from projections. The pockets are varied as to capacity by adjustable blocks, held by binding screws so they can be readily loosened, shifted, and fastened again. The relative arrangement of the guano droppers and the seed droppers is such that the seed and the guano will be dropped together. It will be seen that a great economy of labor will be effected by the use of this machine, which combines eight separate and special machines in one, requires only one horse or mule and one attendant, and neither the horse nor the attendant has to walk along the ridges and tramp the earth down, as when separate machines are used. The principal improvement in the device consists in the vertical pocket slide, arranged to reciprocate up and down in the guano dropper.

Improved Cut-off and Regulating Cock for Gas.

Charles E. Seal, Winchester, Va.—This invention consists in a cock or valve, attached on or near the gas meter or on gas-conveying pipes, and having a flexible connection attaching it to valve-lifting mechanism that has been arranged in the room or apartment where the gas is used.

Improved Horse Hay Rake.

Lyman Litchfield and Jay Spencer Corbin, Gouverneur, N. Y.—This invention consists in a novel means whereby the driver can conveniently use both the foot and hand simultaneously in elevating the rake, in novel means whereby the rake may be adjusted by the driver without leaving his seat, to run on the ground or at a slight distance thereabove, and finally in a peculiar construction of rake-tooth head which allows each tooth to be rigidly held and independently moved, or to be raised with the others.

Improved Mode of Splitting Rock.

Patrick Croghan, Cockeysville, Md.—This invention consists in the method of splitting off blocks of stone by boring subjacently beyond the longitudinal middle line of the block, placing the side pieces across said line and causing the up and down pressure of the wedge to be exerted inside and not on the edge of the rock.

Improved Saponifying Apparatus.

George W. Hatfield, Nashville, Tenn.—This invention relates to means for applying heat, pressure and mobility to the alkali and fatty matter used in the process of saponification, so that the product will be uniform in its character and thus adapted to make a soap of the best and most reliable quality. It consists in arranging spirally upon a common shaft a series of paddles or agitators, which are continually lifting and transferring the fluid matter from one end to the other of a close boiler or mixing chamber.

Improved Plow.

Lewis B. White, Norfolk, Va.—This invention consists in making the landside of a turn plow reversible by a peculiar construction of ends and bottom flanges, so that two landsides are virtually made of but little more metal than one as now constructed. The invention also consists in applying a slotted adjustable wedge between the beam and handles of turn plows, that they may both be held solid and without a chance to move out of their respective positions under strain.

Improved Process of Preparing Corn for Grinding.

William Standing, Da Quoin, Ill.—The object is to produce a superior article of corn flour and corn meal, by subjecting the corn, before it is manufactured, to a steam drying process with steam of high pressure, and with a thorough ventilation of the grain for the rapid escape of all the moisture that may accumulate in the corn while passing through the drying process. The corn is passed over and through several cleaning machines, similar to those used in the cleaning of wheat, then it is elevated into the dryer, having a capacity of about fifty bushels, more or less. But before the corn is admitted into the dryer, the slide, which is placed at the bottom, is closed until the dryer is filled, then the valve is opened sufficiently to permit it (the grain) to escape only as fast as it becomes thoroughly dried. The valve is adjustable to suit any circumstances which may conduce to a slower or more rapid rate of drying. The passing of the grain through the dryer containing a high pressure of steam, say, from seventy-five to one hundred pounds to the square inch, more or less, with the corresponding temperature, is for the purpose of having the latent heat of the steam penetrate thoroughly the germ, phosphate, dextrin, and starch portion of the corn, as also its oil gluten, and neutralize the strong rank smell and taste peculiar and common to all corn, but more especially in the large starch-bearing kinds. As the corn leaves the dryer it is conveyed to and passed over or through machines for the purpose of cooling thoroughly before grinding. The corn is then ground on the best French burrs, somewhat finer than the ordinary style of grinding.

Improved Lawn Mower.

Theodore Soetbeer, Irvington, N. Y.—This invention has for its object to furnish an improved instrument for shearing the edges of grass plots along the edges of walks, beds, etc., where the grass cannot be cut by the lawn mower. To the lower end of the standard or frame, in an inclined position, is secured the lower or stationary blade of the shears. To the blade, near its rear end, is pivoted the rear end of the upper blade. To the latter, near its rear end, is pivoted the lower end of the connecting rod, the upper end of which is pivoted to the crank. Several holes are formed in the connecting rod to receive the crank to enable the instrument to be adjusted. The crank is attached to the end of a shaft, to which, within the frame, is attached a small grooved pulley around which passes a band which also passes around a larger pulley attached to a wheel, which revolves in the lower part of the frame. The wheel is designed to roll along the ground at the side of the edge to be sheared and carry the machine forward, and at the same time by its revolution to work the movable blade. The standard and frame may be adjusted upon each other to adjust the lower blade to the proper hight above the ground.

Improved Match Plane.

James Edwards, New York city.—This invention consists in the improvement of match planes. The face of the tool for cutting the tongue is formed in two parts. An adjustable piece is fitted into a rabbet of the stock, and is made adjustable laterally thereon. By moving this piece out or in, the length of the mouth of the tool is varied so as to correspond with the width of the adjustable iron. A guide is made adjustable on the face of the tool by means of screws and slots, and a gage is provided for regulating the depth of the cut. The iron is made in two parts. By means of this adjustment the space is made broad or narrow to receive the tongue, which is cut of corresponding size. Any ordinary plow iron may be used in the grooving tool, and the tonguing tool may be adjusted to suit the groove. With the adjustable tool and an adjustable grooving tool, the machine is prepared to tongue and groove boards or lumber of all ordinary thicknesses.

Improved Cotton and Rice Chopper.

Joseph B. Underwood, Fayetteville, N. C.—This invention consists in supporting the axle of a cotton cultivator in a U shaped bar hinged at one end and adjustable at the other, so as to regulate the depth at which the plows shall run in the ground. It also consists in horizontal chopping knives arranged to operate in the rear of the cultivator plows. It also consists in a novel arrangement of the plow standard and the chopper bar, so that the choppers will be shielded from the moving soil, or other obstacle. It also consists in means for throwing the choppers out of gear with their operative mechanism.

Improved Soldering Apparatus.

Wm. D. Brooks, Baltimore, Md.—This invention consists in bringing the cans upon a carriage truck or car so as to be centered by the cap holder, and so that the seam which is to be soldered shall come directly under the burners of the soldering apparatus and the pipe. The can is then revolved and quickly heated while the bit of solder that is cut off in the holding tube falls through the lower end thereof and rests with one end on the can, being melted gradually as the can revolves.

Improved Method of Soldering Cans.

George D. Brooks, Baltimore, Md.—This invention has mainly in view to form a tight joint at the junction of a can body with its top and bottom before the solder is applied; otherwise the solder finds its way through, is wasted, and does not form so strong, full, and reliable a joint. The invention consists in the method and in the particular means by which this object is accomplished.

Improved Plow Truck.

John Flanagin, Pawnee City, Neb.—This invention relates generally to gang plows, and particularly to the mode of arranging plows of unequal size in the same gang so that rows may be plowed out deeply, except in close proximity to the plants, where the brace roots would be too much fractured and injured; also, to adapt a single turn plow to be worked without necessitating either horse to tread in the furrow or upon the plowed ground. The invention consists in a triangular wheeled plow truck, in whose front is the clevis, to which the whiffletree is attached, and at whose rear are placed one or more adjustable clevises, to which are attached the plow or plows.

Value of Patents,

AND HOW TO OBTAIN THEM.

Practical Hints to Inventors.

PROBABLY no investment of a small sum of money brings a greater return than the expense incurred in obtaining a patent even when the invention is but a small one. Larger inventions are found to pay correspondingly well. The names of Blanchard, Morse, Bigelow, Colt, Ericsson, Howe, McCormick, Hoe, and others, who have amassed immense fortunes from their inventions, are well known. And there are thousands of others who have realized large sums from their patents.

More than FIFTY THOUSAND inventors have availed themselves of the services of MUNN & Co. during the TWENTY-SIX years acted as solicitors and Publishers of the SCIENTIFIC AMERICAN. They stand at the head in this class of business; and their large corps of assistants, mostly selected from the ranks of the Patent Office: men capable of rendering the best service to the inventor, from the experience practically obtained while examiners in the Patent Office: enables MUNN & Co. to do everything appertaining to patents BETTER and CHEAPER than any other reliable agency.

HOW TO OBTAIN *Patents*.

This is the closing inquiry in nearly every letter, describing some invention which comes to this office. A *positive* answer can only be had by presenting a complete application for a patent to the Commissioner of Patents. An application consists of a Model Drawings, Petition, Oath, and full Specification. Various official rules and formalities must also be observed. The efforts of the inventor to do all this business himself are generally without success. After great perplexity and delay, he is usually glad to seek the aid of persons experienced in patent business, and have all the work done over again. The best plan is to solicit proper advice at the beginning. If the parties consulted are honorable men, the inventor may safely confide his ideas to them they will advise whether the improvement is probably patentable, and will give him all the directions needful to protect his rights.

How Can I Best Secure My Invention?

This is an inquiry which one inventor naturally asks another, who has had some experience in obtaining patents. His answer generally is as follows, and correct:

Construct a neat model, not over a foot in any dimension—smaller if possible—and send by express, prepaid, addressed to MUNN & Co., 37 Park Row, New York, together with a description of its operation and merits. On receipt thereof, they will examine the invention carefully, and advise you as to its patentability, free of charge. Or, if you have not time, or the means at hand, to construct a model, make as good a pen and ink sketch of the improvement as possible and send by mail. An answer as to the prospect of a patent will be received, usually, by return of mail. It is sometimes best to have a search made at the Patent Office. Such a measure often saves the cost of an application for a patent.

Preliminary Examination.

In order to have such search, make out a written description of the invention, in your own words, and a pencil, or pen and ink, sketch. Send these with the fee of $5, by mail, addressed to MUNN & Co., 37 Park Row, and in due time you will receive an acknowledgment thereof, followed by a written report in regard to the patentability of your improvement. This special search is made with great care, among the models and patents at Washington, to ascertain whether the improvement presented is patentable.

Rejected Cases.

Rejected cases, or defective papers, remodeled for parties who have made applications for themselves, or through other agents. Terms moderate Address MUNN & Co., stating particulars.

To Make an Application for a Patent.

The applicant for a patent should furnish a model of his invention if susceptible of one, although sometimes it may be dispensed with; or, if the invention be a chemical production, he must furnish samples of the ingredients of which his composition consists. These should be securely packed, the inventor's name marked on them, and sent by express, prepaid. Small models, from a distance, can often be sent cheaper by mail. The safest way to remit money is by a draft, or postal order, on New York, payable to the order of MUNN & Co. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents.

Caveats.

Persons desiring to file a caveat can have the papers prepared in the shortest time, by sending a sketch and description of the invention. The Government fee for a caveat is $10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & Co., 37 Park Row, New York.

Reissues.

A reissue is granted to the original patentee, his heirs, or the assignees of the entire interest, when, by reason of an insufficient or defective specification, the original patent is invalid, provided the error has arisen from inadvertence, accident, or mistake, without any fraudulent or deceptive intention.

A patentee may, at his option, have in his reissue a separate patent for each distinct part of the invention comprehended in his original application by paying the required fee in each case, and complying with the other requirements of the law, as in original applications. Address MUNN & Co., 37 Park Row, for full particulars.

Design Patents.

Foreign designers and manufacturers, who send goods to this country may secure patents here upon their new patterns, and thus prevent others from fabricating or selling the same goods in this market.

A patent for a design may be granted to any person, whether citizen or alien, for any new and original design for a manufacture. bust, statue, alto relievo, or bas relief; any new and original design for the printing of woolen, silk, cotton, or other fabrics; any new and original impression, ornament, pattern, print, or picture, to be printed, painted, cast, or otherwise placed on or worked into any article of manufacture.

Design patents are equally as important to citizens as to foreigners. For full particulars send for pamphlet to MUNN & Co., 37 Park Row, New York.

Foreign Patents.

The population of Great Britain is 31,000,000; of France, 37,000,000; Belgium, 5,000,000; Austria, 36,000,000; Prussia, 40,000,000; and Russia, 70,000,000. Patents may be secured by American citizens in all of these countries. Now is the time, while business is dull at home, to take advantage of these immense foreign fields. Mechanical improvements of all kinds are always in demand in Europe. There will never be a better time than the present to take patents abroad. We have reliable business connections with the principal capitals of Europe. A large share of all the patents secured in foreign countries by Americans are obtained through our Agency. Address MUNN & Co., 37 Park Row, New York. Circulars with full information on foreign patents, furnished free.

Value of Extended Patents.

Did patentees realize the fact that their inventions are likely to be more productive of profit during the seven years of extension than the first full term for which their patents were granted, we think more would avail themselves of the extension privilege. Patents granted prior to 1861 may be extended for seven years, for the benefit of the inventor, or of his heirs in case of the decease of the former, by due application to the Patent Office, ninety days before the termination of the patent. The extended time inures to the benefit of the inventor, the assignees under the first term having no rights under the extension, except by special agreement. The Government fee for an extension is $100, and it is necessary that good professional service be obtained to conduct the business before the Patent Office. Full information as to extensions may be had by addressing MUNN & Co., 37 Park Row.

Trademarks.

Any person or firm domiciled in the United States, or any firm or corporation residing in any foreign country where similar privileges are extended to citizens of the United States, may register their designs and obtain protection. This is very important to manufacturers in this country, and equally so to foreigners. For full particulars address MUNN & Co., 37 Park Row, New York.

Canadian Patents.

On the first of September, 1872, the new patent law of Canada went into force, and patents are now granted to citizens of the United States on the same favorable terms as to citizens of the Dominion.

In order to apply for a patent in Canada, the applicant must furnish a model, specification and duplicate drawings, substantially the same as in applying for an American patent.

The patent may be taken out either for five years (government fee $20) or for ten years (government fee $40) or for fifteen years (government fee $60). The five and ten year patents may be extended to the term of fifteen years The formalities for extension are simple and not expensive.

American inventions, even if already patented in this country, can be patented in Canada provided the American patent is not more than one year old.

All persons who desire to take out patents in Canada are requested to communicate with MUNN & Co., 37 Park Row, N. Y., who will give prompt attention to the business and furnish full instruction.

Copies of Patents.

Persons desiring any patent issued from 1836 to November 26, 1867, can be supplied with official copies at a reasonable cost, the price depending upon the extent of drawings and length of specification.

Any patent issued since November 27, 1867, at which time the Patent Office commenced printing the drawings and specifications, may be had by remitting to this office $1.

A copy of the claims of any patent issued since 1836 will be furnished for $1.

When ordering copies, please to remit for the same as above, and state name of patentee, title of invention, and date of patent. Address MUNN & Co., Patent Solicitors, 37 Park Row, New York city.

MUNN & Co. will be happy to see inventors in person, at their office, or to advise them by letter. In all cases, they may expect an *honest opinion*. For such consultations, opinions and advice, *no charge is made*. Write plainly do not use pencil, nor pale ink; be brief.

All business committed to our care, and all consultations, are kept *secret and strictly confidential*.

In all matters pertaining to patents, such as conducting interferences, procuring extensions, drawing assignments, examinations into the validity of patents, etc., special care and attention is given. For information, and for pamphlets of instruction and advice

Address

MUNN & CO.,
PUBLISHERS SCIENTIFIC AMERICAN,
37 Park Row, New York.

OFFICE IN WASHINGTON—**Corner F and 7th streets,** opposite Patent Office

© 1873 SCIENTIFIC AMERICAN, INC