

**A New Gold Salt for Toning.**

BY DR. J. SCHNAUSS.

Until now there have been used only the single and double chloric salts of gold for toning. During the past winter Mr. Neumayer, student of chemistry from Munich, visited my establishment and undertook under my directions the preparation of a gold bromide and a gold bromide of calcium, for the purposes of experimenting with these salts and their uses in photography.

Thin leaves of gold are readily dissolved in bromine water and in bromine gas. But a more rational and less disagreeable mode of preparation is by the action of hydrobromic acid, nitric acid, and aqua-regia.

During the evaporation of the gold bromide, which has a dark appearance and smells strongly of bromine, great care is necessary, owing to the fact that the gold bromide vaporizes more easily than the chloride. Bromide of gold is difficult to crystallize. By the addition of an exact equivalent of bromide of calcium dissolved in water, and evaporated, small granite-red crystals of double salts are obtained.  $KBr + AuBr_3 + 5H_2O$  can be with difficulty dissolved in water; but a thin solution is of a deep red color, and effloresces in dry air.

I have tried these double salts, also the gold bromide, with several additions as a toning bath. In its general effect on silver copies it is analogous to gold chloride combinations, except that in the same proportions it acts more energetically.

The addition of soda bicarbonate gives a blue-black tone, melted acetate of sodium a purple colored tone.

For a lasting gold bath, in form of a *sel encoussé*, these salts are recommended.—*Archiv.*

**How to Prepare Photographs for Printing Blocks.**

In the *Photographisches Archiv* appear the details of a simple method of securing an outline photograph in metal suitable for printing with type in the ordinary printing press. It is necessary to be somewhat of a draughtsman, no doubt, in order to be able to do the work well and rapidly, although nothing is said on this head, but hardly any one could, hap-hazard, undertake the matter.

Only a well marked photograph with bold lines, and in which minor details are of no account, is suitable, and the negative is in the first place put into a camera or other apparatus to furnish an enlarged positive. Upon this enlarged positive are traced, in Indian ink, the bolder lines which it is desired to retain, a pen or brush being employed for the purpose, according to the nature of the work or the desire of the draughtsman. After all details have been in this way traced, with thoroughly black pigment, the lines of a thickness corresponding to the original object, and of such a nature as to be readily reproduced by photography, the print is treated with chloride of lime or other bleaching agent, and in this was the whole of the image obliterated with the exception of the block lines made by the draughtsman.

The picture is now photographed, and in this way a small negative secured, or one, at any rate, of the dimensions of which the printing block is to be. In this case the negative will be perfectly opaque in the lights and transparent in the shadows, and from it may be easily produced, by any of the etching processes, an engraving upon zinc capable of being used in the printing press with type.

Chloride of lime is specially mentioned as the bleaching agent wherewith to render invisible the details of the silver image, after the draughtsman has done his work. We should think that a solution of bichloride of mercury would be much more effectual in making the original photographic image disappear.

**Aluminum.**

In a recent meeting of the Miners' Union at Freiberg, Professor Winkler described some experiments made to measure the power which aluminum possesses of resisting external influences. Tablespoons made of aluminum, of silver (75 per cent), and of German silver of best quality, were the subjects of experiment. They were in the same daily use, and were weighed at regular intervals. These spoons were purposely brought into contact with the greatest variety of food, and each time after using were rubbed with soap, washed in hot water, and rinsed with cold water. They were also occasionally washed with a dilute solution of carbonate of soda, so that they were in daily contact with hot and cold acid and alkaline liquids.

In the course of time there was a change in the appearance of the spoons. The aluminum, which at first was a beautiful white, lost its brightness and acquired a dead, bluish-grey color; the German silver also lost its brightness, while its color changed to a disagreeable greyish-yellow; the silver stood best, as it only lost its polish, but remained comparatively white. Repeated weighings showed an average annual loss in weight of:

- 0.630 per cent for aluminum,
- 1.006 " " German silver,
- 0.403 " " silver;

so that if it were possible to use them until entirely used up, a silver spoon would last 248 years, one of aluminum 158 years, and one of German silver 99 years.

The spoon form was selected merely because it offered the best opportunity for measuring the amount of chemical and mechanical loss in comparison with other metals and alloys tested. The results of these experiments showed that aluminum is not nearly so easily attacked as has hitherto always

been supposed, but is more like zinc; and if it could be made at a low price, it might be employed for a great variety of purposes.

**NEW BOOKS AND PUBLICATIONS.**

**LIGHT—A SERIES OF SIMPLE EXPERIMENTS, ETC.,** by Alfred M. Mayer and Charles Barnard. D. Appleton & Co. 549 and 551 Broadway. 1877.

There have been so many attempts to popularize scientific experimenting, that we took up this little book with some curiosity as to the new guise in which we were sure Dr. Mayer would present his experiments. The way in which that curiosity is gratified is to us very satisfactory. The experiments are capably selected and equally as well described. In fact the book is conspicuously free from the multiplicity of confusing directions clear enough to the writer but not to the reader, with which works of the kind too often abound. Beginning with the heliostat and its simple construction, Dr. Mayer takes up the phenomena of reflection, refraction, and decomposition of light, giving a few—and carefully avoiding too many—experiments in each branch, which are the best suited to fix the particular principle under study. Complicated and expensive apparatus is avoided, and everything needed for the entire course may, we are told, be bought for 15 dollars. There is an abundance of excellent illustrations, and Mr. Charles Barnard, who describes the various experiments as they were produced before him, has certainly ably supplemented Dr. Mayer's work. Altogether the book is very commendable, and especially so to the readers of the SCIENTIFIC AMERICAN.

**A TREATISE ON ENGINEERING CONSTRUCTION.** By J. E. Shields, C.E. New York: D. Van Nostrand & Co., Publisher, 23 Murray street. Price \$1.50.

A plainly written clear and readable little book, which owes its value to the fact that it is claimed to be the results of the author's own experience gained in a professional practice of many years. It deals with practical subjects throughout. There are chapters on sand, concrete, caissons, pile driving, etc., under foundations—a division is devoted to masonry, another to tunnels and the last to engineering geodesy. An excellent work for young students in the profession, and a handy book of reference for any civil engineer.

**THE RAILWAYS OF NEW SOUTH WALES.** A report on their Construction and Working from 1872 to 1875 inclusive. By John Rae, A.M., Commissioner for Railways. Published by the Government, Sydney, N. S. W.

Mr. Rae's report shows with much clearness the advantages accruing from investing capital in railways well managed and opening up a new and growing country to commerce. At the end of the four years noted there were 437 miles of road in the colony in operation and an additional length of 251 1/4 miles in progress. The expenditure for rolling stock, machinery shops, etc., had been about \$32,895 per mile—48 1/8 per cent of the earnings were spent in maintenance and working. For every mile open the earnings were \$7,495—the expenditure being \$3,610 and the net earnings \$3,885. The net earnings show an increase of 10 per cent for the year 1875 over that of the year 1871. A supplement to the report gives detailed descriptions of the lines and works of construction, which will be found of value to railroad civil engineers for purposes of reference and study.

**MANUAL OF THE RAILROADS OF THE UNITED STATES FOR 1877.** By Henry V. Poor. 10th series. Published by H. V. & H. W. Poor. 68 Broadway, New York.

Poor's manual gives as usual a valuable and very full compilation of statistics relative to all the railroads of the country, showing their present status and also their history during 1876. The past year, we learn, has been one of great depression in the railway business although the aggregate results of all operations has been "fairly satisfactory." The number of miles of road opened during the year was 2,356 against 1,919 miles for 1875, 1,911 miles for 1874. This increase is due to activity in the Southern Pacific lines and in narrow gauge lines in Ohio, Texas, and Colorado. No new lines of any magnitude have been undertaken. The gross earnings of the business have fallen off \$5,807,546, and the net earnings have increased \$945,514, the latter owing to the economies practiced in operating the roads. The information given regarding the various lines covers financial condition, property, etc., with much detail. There is a valuable appendix showing State debts and liabilities.

**A TREATISE ON THE USE OF BELTING FOR THE TRANSMISSION OF POWER.** By John H. Cooper, M.E., Philadelphia. Claxton, Remsen, & Haffelfinger, 324 Market street.

A thorough and complete treatise on the subject of belting has been needed by mechanical engineers for a long time. Information on the subject, of which there has been no lack, has remained scattered through the files of this and other journals or has appeared in the shape of chapters in works covering very much wider ground. Hence the matter of belting has not obtained that exhaustive treatment which its importance really warrants for it, and hence we are more gratified to see so well qualified an engineer as Mr. Cooper undertake and carry the task to a successful completion. The only blemish—if it indeed be one at all—is that his work is too full; original papers are quoted in abundance where perhaps condensation would have better suited the needs of the practical reader while the risk of repetition might have been avoided. But as a whole the book is excellently well compiled from a large number of sources. The best and newest of all on the subject has been culled. Practical hints and suggestions abound, there is a multiplicity of rules, recipes, and useful tables, and an ample supply of good woodcuts.

**Inventions Patented in England by Americans.**

From July 31 to August 6, 1877, inclusive.

- AXLES.—B. T. Babbitt, New York city.
- BARBED WIRE FENCE.—H. W. Putnam, Bennington, Vt.
- BOOK.—E. S. Boynton, New York city.
- EXTRACTING WORT FROM MALT.—R. d'Heureuse, New York city.
- FIRE ARMS.—E. T. Starr, New York city.
- GAS APPARATUS.—W. W. Batchelder, New York city.
- PLUMBER'S TRAPS, ETC.—J. E. Folk, Brooklyn, N. Y.
- PUNCHING AND SHEARING MACHINE.—D. Brickner, New York city.
- SEWING MACHINE.—L. R. Blake, Boston, Mass.
- SHOE MACHINERY.—H. G. Thompson, Milford, Conn.
- TELEGRAPH INSTRUMENT.—T. A. Edson, Menlo Park, N. J.
- TOOL HOLDER.—E. F. Bengler, Williamsport, Pa.

**Recent American and Foreign Patents.**

**Notice to Patentees.**

Inventors who are desirous of disposing of their patents would find it greatly to their advantage to have them illustrated in the SCIENTIFIC AMERICAN. We are prepared to get up first-class WOOD ENGRAVINGS of inventions of merit, and publish them in the SCIENTIFIC AMERICAN on very reasonable terms.

We shall be pleased to make estimates as to cost of engravings on receipt of photographs, sketches, or copies of patents. After publication, the cuts become the property of the person ordering them, and will be found of value for circulars and for publication in other papers.

**NEW HOUSEHOLD INVENTIONS.**

**IMPROVED SHADE HOLDER.**

Gustavus H. Reck, Bethlehem, Pa.—This invention relates to an improved shade holder that adapts itself to any shape of burner, with iron, brass, lava, or other tip of a larger size than the body; and the invention consists of a shade holder having arms and springs fastened by their bent ends into a U-shaped collar or ring. The springs produce a firm fitting of the shade holder to the burner without being liable to get shaky or loose, as the arms and springs are attached without solder, and retained firmly by the binding action of the collar or ring, forming thus a strong, durable and tightly fitting shade holder.

**IMPROVED LAMP BRACKET.**

John Forster, Coal Valley, Ill.—This invention relates to an improved safety lamp stand for sewing machines, pianos, organs, and other purposes, and consists of a base part clamped or screwed to the table of the sewing machine or other object, and provided with a detachable standard and oil cup stand, the standard having an adjustable stand and collar for the lamp, and a pincushion at the top.

**IMPROVED RECIPROCATING CHURN.**

Daniel A. Fiske, St. Louis, Mo.—When the dasher of this churn is raised the wings turn down, permitting the dasher to rise easily through the cream. When the dasher is forced downward the wings are thrown up, and the inclined surfaces of the various portions of the dasher cause the cream to rotate. The upward motion of the dasher checks this rotation. The intermittent rotary motion of the cream is effective in separating the milk and butter, and the same motion tends to unite the particles of butter.

**IMPROVED WRINGER.**

Edwin Banfield, Jermyn, Pa.—This machine is designed for use as a wringer and as a mangle upon table linen, bedclothes, and other plain articles that are free from buttons, hooks and eyes, and other fasteners. The invention consists of the combination of wringer rolls, of a bevel guide to transfer the waste water where it is guided by cleats into a tub, and inclined tables or levers, to which the guides and cleats are attached. When the machine is to be used as a mangle, the table, with the cleats, is inverted, and the tables are adjusted in a horizontal position.

**IMPROVED ROTARY CHURN.**

William Knaggs, Richview, Ontario, Canada.—The object of this invention is to furnish an improved churn dasher which shall be so constructed as to bring the butter very quickly, and gather it quickly and thoroughly. The dasher rod is made square, passes through square holes in the centers of crossbar, and its end revolves in a step or socket attached to the bottom of the churn body. The other end of the rod is enlarged, passes through a bearing, inserted in a hole in the top of the churn body, and attached to or formed upon a small plate secured to the top. By this construction, when the dasher is turned forward the milk is drawn inward by the bars, is forced through the opening between their inner edges, and strikes against the inclined bars, by which it is divided and thrown in opposite directions. When the dasher is turned backward the rear sides of the bars act as paddles or ladles for gathering the butter.

**IMPROVED ROTARY CHURN.**

Honoré G. Fougou, Cape Girardeau, Mo.—This invention relates to a new motive power which is especially designed for mixing liquids, for churning butter, and for other purposes where a rapid and alternate rotary motion is found useful. The aperture may be made small enough to fit an ordinary tumbler, or can be constructed on a scale large enough for churning butter or washing fabrics. The upper end of a spindle has a bearing in a handle, which is screwed fast upon the cap. The lower end of the spindle is screw-threaded to receive the shaft of a dasher, which may be of any desired form. Between the upper end of the dasher shaft and the top of the cap a balance wheel is applied, on the tapering part of the spindle, and confined by friction, so that in the event of the dasher meeting with a resistance which would be liable to injure the machine the said wheel will slip. Inside of the cap is fitted a collar which may be made of sheet metal, and which is constructed with a circular flange that receives upon it a cylinder. The collar will prevent fluids from getting inside of the cap. The cylinder is designed to prevent fluids which are being agitated from flying out of the vessel containing them. The machine is operated by means of a strong chord, which is wound around the pulley on a spindle, and which may be held in the hand or attached to a lever, and guided by a pulley. This improved agitator will be found very useful for mixing all kinds of fluids, for churning, making ice cream, beating eggs, washing fabrics, and for many other purposes.

**NEW MECHANICAL AND ENGINEERING INVENTIONS.**

**IMPROVED CORN PLANTER.**

William M. Steel, White Day, W. Va.—This invention consists in the combination of the U-shaped iron bars with the axle of the sulky, to adapt it to receive the operating parts of the machine; and in the combination of the bar, the hopper or hoppers, the dropping slides, the spring bar, the stud, and the block or blocks with the U-bars and the axle and wheel of the sulky. To the rear side of the axle are bolted the forward arms of two U-shaped iron bars, within which is secured a wooden bar. To this bar is attached a long hopper, or two short hoppers, to receive the seed, and from which the seed is removed by dropping slides which have holes formed in them of such a size as to contain enough seed for a hill, and pass through slots in the front and rear sides of the hopper. The forward ends of the dropping slides are pivoted to a spring bar, one end of which is attached to a stud attached to the axle near one wheel, and its other end projects so as to be struck by a block or blocks attached to the spoke or spokes of the other wheel. The slides are kept from carrying out any more seed than enough to fill their dropping holes by rubber blocks attached to the forward side of the hopper. The seed drops from the slides, through holes in the bar, into the conductor spouts, attached to the lower side of the said bar, and upon the lower ends of which are formed, or to them are attached, points to open the soil to receive the seed and points to cover the seed. The spouts are connected by a rod, so that their lower ends may be adjusted to plant the rows wider apart or closer together. The distance apart of the hills is regulated by the number of blocks attached to spokes of the wheels. The amount of seed dropped for a hill is regulated by using slides with larger or smaller dropping holes.

**IMPROVED STONE-QUARRYING MACHINE.**

John B. McRae, Mount Holly, Ark.—The object of this invention is to work the large quarries of soft white stone which are found in Texas and other States, and which produce a very useful building material, by a machine which is designed to cut the stone in the quarry directly into blocks of the required size in a quicker and more economical manner than with the present slow and tedious methods of quarrying them; and the invention consists of a car with a steam engine or other motor driving a vertical and adjustable front saw, a horizontal and adjustable saw back of the same, and a third vertical rear saw, at right angles to the front saw, to divide the long pieces of stone cut from the bed into blocks of the required size. The rear saw is made vertically adjustable by a suitable lever and guide arrangement. A car of suitable size is propelled to the place of work on a track laid in the quarry. The car is provided with a steam engine or other motor, by which the cutting saws are revolved and the car moved forward while the machine is in operation. The car is moved up along the bed of stone as the cutting progresses. At the front part of the car is placed a vertical saw, of suitable diameter, that cuts down into the bed of stone.

**IMPROVED HYDRANT VALVE.**

Frederick Shriver, Grand Rapids, Mich.—The object of this invention is to construct a hydrant valve that cannot freeze or become obstructed so as to be inoperative. Above the valve seat openings are made through the sides of the part of the valve that projects into the supply pipe and passages are formed in the projections on opposite sides, which extend downward below the casing to permit the escape of waste water. The valve consists of a follower, which is reduced in diameter to receive the packing which caps over its end and extends upward to the shoulder, which is undercut to retain the edges of the packing. Below the packing a centrally perforated disk is placed, which is provided with a lip around its outer edge that projects downward. Below the disk there is a leather or rubber

packing disk, and a screw passes through the disks and packing into the follower, holding all of the parts together. Above the shoulder the follower is reduced in diameter to permit the waste to escape through the passages when the valve rests on its seat. A rod is screwed into the valve for operating it. The part is connected with a supply pipe, and the casing with the upper portion of the hydrant by a pipe. When the valve is raised it closes the waste passages and allows the water to pass from the passage through the openings to the chamber, and thence through the pipe. When the valve is closed the water remaining in the pipe escapes through the waste passages, and should one of the passages become clogged the other is sufficient for the escape of the waste water. The valve casing may be made partly from pipe fittings, or it may be cast entire from steam metal or other suitable machinery.

#### IMPROVED MILLSTONE-DRESSING MACHINE.

Frank Miller, Lapeer, Mich.—The object of this invention is to furnish a device for dressing millstones which will keep a perfectly true surface upon a stone, and will feed the cutter forward automatically as each cut is made. The invention consists in a combined frame and slotted arm, a pivoting bolt, pivoted slotted lever, sliding crosshead, cutter, pawl, ratchet wheel, and a swiveled screw adapted for use in dressing millstones. A small rectangular frame is slotted longitudinally to receive a bolt, by which the inner end of the lever is pivoted. The inner end of the lever is slotted longitudinally to receive a pivoting bolt, so that the said bolt may be adjusted to cause the cuts to approach each other at a greater or less angle, as may be desired. The lever rests and vibrates upon the top of the frame and arm. The part of the lever that is over the frame has longitudinal flanges formed upon its upper and lower sides, to serve as ways for a crosshead to slide upon. To the crosshead is pivoted the end of a pawl, which rests upon the upper end of the cutter, or upon some other stop attached to the said crosshead. The cutter makes the cut as the crosshead is drawn inward, and as the said crosshead is pushed outward the engaging end of the pawl strikes against the teeth of the ratchet wheel and turns it. As the screw is turned by the outward movement of the crosshead the lever will be moved laterally to bring the cutter into the proper position for making another cut. With this construction the stone will be dressed from the eye to the skirt, just the same as a stone will wear, facing the stone at the eye or center, and cracking it at the skirt.

#### IMPROVED ADJUSTABLE GAUGE FOR SAWMILLS.

Franklin Wheeler, Berlin, N. H.—This invention has relation to gauges for circular-saw mills; and the nature of the invention consists in a gauge or guide applied to a bar which is adjustable between guides, and provided with a handle and a latching device. The bed plate of the gauge is secured upon a solid foundation, and arranged at right angles to the plane of the saw. On this bed plate are constructed two parallel guides, between which is a sliding gauge bar. A gauge roller is applied on a post, so as to rotate freely, which post is rigidly secured to one end of the bar, and stands perpendicular to it. A handle is secured to a bar at the end bearing the roller, and which is perpendicular to this bar. To this handle is pivoted a latch bar, to the free end of which a shouldered latch pin is loosely applied, which passes freely through the bar and enters one of a number of holes made through the bed plate between the guides. Rising from the pivoted end of the latch bar is a tongue, between which and the handle is a spring that acts to keep down the latch pin. By firmly grasping the handle and tongue the pin will be raised out of its hole, and the gauge bar can be adjusted endwise, according as it may be desired to edge the staff to be sawed. The top of one of the guides is graduated by marks corresponding to the holes, and a pointer fixed to the bar opposite to the latch pin is used to indicate the position of the roller with respect to the saw.

#### IMPROVED TWISTING SPINDLE FOR MAKING CORDAGE.

Charles E. Brownell, Moodus, Conn.—The object of this invention is to furnish an improved spindle for twisting twine and other three or more strand cordage, which shall be so constructed as to enable the twist to be made tight or loose, which shall be evenly balanced, and which will stop itself automatically should one of the strands break. To the spindle is attached two plates. In the plates are formed holes to receive the journals formed upon the end plates of the fliers. To the upper side of the upper plate are attached the ends of springs which have bends formed in them near the hollow journals of the fliers to receive the strands. The springs are so formed that when left free their bends will be upon the outer sides of the hollow journals, and their outer ends will project beyond the periphery of the plate. By this construction the tension of the strands will draw the free ends of the springs inward; and, should the said strands break, the elasticity of the said springs will throw their outer ends outward, to strike against the frame of the machine or against stops, attached to said frame to stop the device and prevent waste of material. The springs thus act as tension devices and as automatic stops. The tension upon the strands may be varied by regulating the force of the springs and increasing or diminishing the number of coils of the strands around the arms. The ring plate on the spindle can be driven at different velocities, thus imparting to the fliers any relative number of revolutions to one of the spindle. In this way the twist of the strands can be exactly adjusted to the last twist, so that the completed cork will not kink.

#### IMPROVED DREDGE BUCKET.

James McSpirit, Jersey City, N. J.—The object of this invention is to provide a device for operating dredge buckets and grapples by means of levers and connecting rods, and to dispense with the usual windlass and other objectionable devices. This arrangement of the lever and connecting rod forms a pair of toggle joints for each half of the bucket, which are capable of forcing them together against great resistance. A roller is journaled in the upper part of the frame for guiding the chains that operate the buckets. A chain is attached to the sheave, and winds partly around it when the buckets are closed, and extends upward to the crane that supports the buckets, and a chain is attached to the upper end of the lever, and passes under the roller and upward to the crane before mentioned. It is obvious that the levers and devices described in connection with dredge buckets may be employed with equal advantage to operate grapples.

#### IMPROVED INDICATOR FOR MINING SHAFTS.

Calvin O. Richardson, San Francisco, Cal.—This invention consists of a bell having a spring tongue or clapper that vibrates easily, so that when the bell is attached to the hoisting rope of a mining shaft, and the tub or cagedescending, the clapper will strike the bell when there is a slight checking or variation in speed, which is caused by the momentum of the clapper overcoming the slight resistance of the spring tongue. Thus warning is given of the descent of the cage or tub. A more violent ringing is caused as the tub approaches the bottom, by the brakeman making a few sudden pressures upon the brake, thus warning the workmen to stand from under.

#### IMPROVED STEAM ENGINE.

William Walker, Bury, England.—This is a tri-cylinder engine of the vertical pattern. The pistons have reduced extensions, and a bored passage extends through both. When a piston recedes in its cylinder the extensions uncover the live ports and admit steam to the contiguous cylinder which thus acts on the contiguous piston and forces it down. When this last-named piston rises, an aperture in its extension registers with the live steam port and the exhaust of the contiguous piston then takes place down through its bored passage. Thus, as each piston descends, it opens the port of a contiguous piston, and, as it rises, it opens the exhaust for the piston on the other side. The engine is reversed by a suitable rotary valve.

#### IMPROVED HOISTING MACHINE.

Henry Batt, Kentish Town, London, Eng., assignor to Leonard G. Tabraham, Boston, Mass.—This invention consists in the combination of the

fast and loose pulleys, short shafts, sliding gear wheels, large gearwheels, and clutches with each other. When certain wheels are in gear the machine works with great power and slow movement. When other wheels are in gear a faster movement is obtained, but less power. When other wheels are in gear it will work as a single purchase hoist and with medium power and speed. Brake straps are arranged for controlling the movement of the apparatus, which are attached at one end to the frame, passing over a drum wheel, and their outer ends are attached to the short arms of bent levers, which are pivoted at their angles to the frame, or to supports attached to said frame, and are provided with catch bars to hold them in place when adjusted.

#### NEW MISCELLANEOUS INVENTIONS.

##### IMPROVED HORSE-DETACHING APPARATUS.

Warren Jones, Berlin, Wis.—The object of this invention is to provide an improved horse-detaching apparatus for vehicles, designed to enable the driver to entirely disconnect the team without getting out of the vehicle, either for convenience in practical every-day use, or for special emergencies in the event of a runaway or fall of the horse. To this end the improvement consists mainly in the particular construction and arrangement of a locking stud for the trace combined with the ferrules on the whiffletree, so as to be moved outwardly from the end thereof to release the tracer; and it also consists in the combination with the detaching devices of a peculiar form of brake designed for simultaneous and joint operation with the detaching devices, to stop the momentum of the vehicle and prevent accidents which might occur, after the horse is loose, in going down hill or over dangerous roads.

##### IMPROVED HANDLE ATTACHMENT FOR CARPETBAGS, ETC.

Abraham Kaufmann, New York city.—The object of this invention is to provide for satchels, traveling-bags, pocketbooks, and similar articles an improved spring clasp for holding the jaws of the satchel frame rigidly in closed position, the spring clasp being used in connection with the handle or separately at the ends of the satchel frame, as desired, and forming a neat and reliable closing device in addition to the lock. The pivot clasps at present in use on satchels and bags bind sometimes too tightly on the jaws so as to chafe the leather of the same, or work too easily so as not to close the frame reliably, or get bent or broken, or present other objectionable features, which this clasp is intended to overcome, as it will always fit the frame, lock the same rigidly, and be operated especially when connected to the handle by the mere raising of the handle, without separately taking hold of the clasp for closing. The invention consists of a clasp, of angular or other shape, pivoted to posts of the outer jaw and binding over the other jaw. The clasp is retained in locked position by a spring pin entering a hole of one of the posts, and being pushed back for releasing the clasp by a sliding thumbpiece. The swing clasps are provided with sockets, into which ferrules at the ends of the satchel handles are inserted and locked by a kind of bayonet joint.

##### IMPROVED BOOKBINDING.

Oswald Routh and John S. Routh, New York city.—This invention relates to the binding of books; and it consists in fastening the leaves together by means of metallic clips which take the place of the usual tape. The invention is especially applicable to schoolbooks, but it may be applied with advantage to books of other descriptions. The common difficulty with tape-bound books is that the tape becomes torn or broken by the constant and usually careless opening of the book, and the leaves of the book become loose, and are soon lost or destroyed. Another difficulty with books bound in usual manner with tape is that the cover must be formed on the book; a finished cover cannot be applied. By this improvement these difficulties are avoided, and the book is made stronger and more durable, and may have applied to it an embossed or ornamental cover.

##### IMPROVED BALE TIE.

Robert G. Stewart, Augusta, Ga.—This invention relates to means for fastening bands around bales of all kinds of material; and the nature of the invention consists in a novel way of uniting the lapped ends of a bale band by means of a screw, whereby a substantial and safe fastening can be made with great facility. A screw is passed through one of the holes of the end of the band until the neck comes within the hole. The upset portions are then reset or pressed back, so that they will not allow the screw to be removed, but will allow it to turn freely. The screw thus permanently attached to the band will not get lost. When the ends of the band are lapped around a bale, the screw is set home into the end, and a firm fastening is made. By means of a wrench of a suitable kind, the ends of the hoop can be very forcibly drawn together and held fast.

##### IMPROVED COFFEE CLEANER.

Patrick McAuliffe, New York city.—This invention has reference to an improved machine for cleaning and polishing coffee in superior manner, the machine being of simple construction, run with comparatively small power, and producing a very satisfactory result, as all the skinny particles are screened off and the appearance of the coffee greatly improved. The invention consists of revolving scoop-shaped wings or stirrers, in connection with a drum or cylinder mounted loosely on the stirrer shaft, and following the motion of the stirrers, the drum being made of sheet metal, with laterally alternating perforated and not perforated sections. The weight of the coffee and the motion of the stirrers impart to the loosely mounted cylinder a motion in the same direction as the stirrers, but considerably slower than the same. This produces continuous changes in the position of the coffee in the cylinder, so as to exert an additional cleaning and polishing influence upon the same. The influence of the lifting and dropping of the coffee by the stirrers, in connection with the difference of the motions of the stirrers and cylinder, produces the effective polishing of the coffee by a machine of simple construction and operation.

##### IMPROVED COPYING PRESS.

Elias Gill, San Francisco, Cal.—This invention relates to an improved copying press, of simple and effective construction, that combines economy, utility, and convenience with lightness and facility in handling, the same requiring no extra stand, but being placed, without fastening, on any table or support, and readily put away when not required for use. The press is readily operated by bringing the cam handles toward each other, allowing the top board to remain for a short time in this position, and then reversing the cams, so that the rubber springs raise the top board and admit the taking out of the copying book. The press may be furnished at less cost than any one of the common screw presses in use, while it furnishes just as good copies. It needs not to be screwed or fastened down to keep in place, as the pressure is exerted at the same time at both ends of the same. The press, when of wood, is light and easily handled or removed, but strong enough for all the purposes required.

##### IMPROVED CONCRETE PAVEMENT COMPOUND.

Edwin Jacques, Great Falls, N. H., assignor to himself and Raphael Gotier.—The object of this invention is to construct street pavements, sidewalks, and basement floors of a compound or concrete which will not be liable to crack, nor to be injuriously affected by frosts or extremes of temperature, and which will be cheap and require only ordinary skill to lay it down. Formula: For about twenty-seven square yards of pavement, mix together, in about the same proportions named, 1 barrel of gas tar, 20 lbs. of "gum" tar, 1 lb. of alum, 1 lb. of washing soda,  $\frac{1}{4}$  lb. of brown potash, 19 ordinary sized wheelbarrow loads of sharp sand. The gas tar is boiled with the gum tar about one hour and a half. Then add the potash, alum, and soda, dissolved in about one gill of water. The sand is then added by making alternate layers of it with the first named ingredients. The concrete is then run through a machine suitably adapted to the purpose, which thoroughly mixes the ingredients. The bed or ballast for the

pavement is composed of small stones, properly tamped down, and then the hot concrete is spread on the gravel to the thickness of about three inches, and rolled down solid. For gutters, add a finishing coating of boiled tar.

##### IMPROVED TOOL STOCK FOR DENTAL ENGINES.

Edwin Telle, New Orleans, La.—This stock is formed by coiling a wire spirally and then coiling another wire around it in the other direction. This construction makes the stock flexible, and prevents the wires from uncoiling when in use. The stock may be made of steel or other suitable metal, may be made of any desired flexibility, and may be made flexible for the entire length, or may be made partly flexible and partly solid, as may be desired. With this construction the various operation of smoothing rough surfaces upon teeth, and of shaping, smoothing, and polishing complicated gold filling, will be much more pleasant to the patient than when said operations are performed with the wheels, disks, and points mounted upon rigid stocks, and there will be much less liability to break thin and delicate corundum disks.

##### IMPROVED MEASURING DEVICE FOR FILLING CARTRIDGES.

John D. Wilkinson, Plattsburg, N. Y.—The object of this invention is to furnish to sportsmen and others an improved cartridge loading implement, by which the charges of powder of the required size are obtained in quick and accurate manner, and the loader consists of two cylinders, one sliding within the other and turning between top and bottom plates, to which they are pivoted. The top cylinder has an opening and changing tube, registering with an opening of top plate and funnel, and the lower cylinder a connecting tube and opening registering with exit opening and spout of bottom plate. When the loader is clamped to the table, adjusted to the charge desired, and the powder placed in the funnel, the drums or cylinders require only to be turned from the supply hole to the discharge hole and back, and a charge is furnished with each forward turning of the drum, so as to produce the rapid and accurate charging of the shells in uniform manner.

#### NEW AGRICULTURAL INVENTIONS.

##### IMPROVED RIDING PLOW.

James L. Florance, Plano, Texas.—The object of this invention is to furnish an improved riding or sulky plow which is so constructed that the plow may be readily lowered into, raised from, and adjusted to run at any desired depth in the ground, and which may be adjusted to take or leave land, and to hold the carriage level when both wheels are running upon unplowed land, and when one wheel is running in a furrow. To the rear part of the side bars of the frame are attached the upper ends of two bars, the lower ends of which are bent outward, or have hooks formed upon them, to catch upon a crank when the plow is raised out of the ground to pitch the plow forward and prevent the forward end of the beam from interfering with the tongue or its brace frame.

##### IMPROVED CORN HARVESTER.

Washington B. Mayfield, Seneca, Mo.—The object of this invention is to furnish an improved machine for harvesting corn by stripping the ears from the stalks while standing in the field; and the invention consists in the combination of strippers, bales, levers, and a box made with an inclined bottom, a vertical flange or apron, and a detachable back, with the wheels and axle and the frame work of the machine. The strippers are formed of a number of parallel fingers, placed about an inch and a half apart, and made about an inch and a half wide upon their upper sides. The fingers are made thinner upon their lower sides, so that the stalks cannot wedge themselves while being drawn through. The ears, being thicker than the spaces between the fingers, will be stripped from the stalks and left upon the said fingers. The strippers are made to move up and down vertically by guide pins attached to their rear ends, and which pass through vertical slots in the apron or flange. The strippers are hung with their forward ends inclined upward so much that when the said strippers are raised above the level of the forward side of the box the ears will slide from them into the said box. When a sufficient quantity of ears has been collected the sliding back of the box is raised and the ears are allowed to slide out, and are left upon the ground in a heap.

##### IMPROVED DEVICE FOR DEPOSITING FEED IN TROUGHES.

Andrew J. Rush (Simpson's Store P. O.), Nineveh, Pa.—The object of this invention is to furnish an improved device for feeding grain to sheep in troughs, which is so constructed as to spread the grain evenly through the trough, and prevent the spilling and waste of the grain from the crowding around of the sheep. The invention consists in the combination of bars, wheels, sliding bottom, and lever with the feed box; in the combination of regulator and its lock with the feed box, the lever and the sliding bottom, and in the combination of the curved rods; and the sliding stroke board with the sliding bottom, the lever, and the feed box. To the outer corners of the sliding bottom are pivoted the ends of two rods, which pass through the guides attached to the forward parts of the sides of the box, and through the projecting ends of a bar attached to a board, that slides up and down upon the rear side of the lower part of the box. The rods are so curved that, when the sliding bottom is drawn outward to allow the grain to flow out, the sliding board will be lowered to stroke off or level the grain in the trough, so that it may be of uniform depth, giving all the sheep an equal chance at the feed.

##### IMPROVED MILK COOLER.

Charles W. Loller, Unionville, Pa.—This invention has reference to a milk cooler that admits the action of the cooling medium on the bottom and sides of the pan, together with an adjustment of the level of the water to the level of the milk in the pan. The invention consists of a milk pan with bottom inclined from the sides toward the center line. The pan is set into and connected to an inclosing water tank, having adjustable exit pipe to regulate level of water in the same. The cold water enters at one corner and passes around the pan in the surrounding space to an exit pipe at the opposite corner, its level being controlled by a vertically sliding pipe, to correspond to the level of the milk in the pan. The bottom of the pan is made dishing by being inclined at a suitable angle from the longer sides to the center line of the pan. This produces triangular spaces between the bottom of pan and vat, into which the cold water may enter, so that the bottom of the milk pan is cooled off in the same manner as the sides. The connection of pan and vat forms a connected cooler that is conveniently handled. The vat may be readily cleaned by taking out the sliding tube, and the milk drawn off from the pan by an exit pipe and suitable stopper, in the customary manner.

##### IMPROVED TOBACCO PLANT PLANTER.

Robert A. Knox, Ghent, assignor to himself and Darrall Brothers, Louisville, Ky.—This is a hand-machine for setting out tobacco plants, and is so constructed as to open a hole to receive the plant, guide the plant into the hole, and press the soil around it. In using the machine, it is carried by the handle, and is placed upon the spot where the plants are to be planted, and the other hand is pressed down upon the knob of a rod, which forces the head into the soil and opens a hole to receive the plant. The operator then removes his hand from the rod, allowing the head to be withdrawn from the ground by a spring, takes a plant from a sack that he carries around his neck, and drops it root downward into the spout, a semi-conical plate guiding it into the hole opened by the head. The operator then presses two handles together, which forces sliding bars downward and presses the soil around the plant. The two handles are then released, allowing the spring to raise the bars, and with the thumb of the hand that grasps the two handles the operator presses the rod, which swings the lower part of the plate back and allows the machine to be raised, leaving the plant standing in the ground.