

splendid and expanding markets are entirely lost to the manufacturers and merchants of the old country.

"The competition is not confined, as formerly, to those articles for the production of which the Americans enjoy natural advantages, such as wood work, but extended to leather goods, tinware, machinery, every description of implement and edge tool, carriage axles, force pumps, spades, shovels, axes, forks, files, locks, scales, tacks, rivets, pulleys, sewing machines, stove grates, guns, pistols, and other products too numerous to mention. In all these branches of manufacture the Americans are rapidly increasing their Australian business, whilst the English makers are losing ground. Australian commerce, as a whole, is certainly expanding, yet the returns of many well known English firms who supply the markets of Sydney and Melbourne are not now one tenth of what they were a few years ago. If we ask for an explanation of this extraordinary falling off, from those who are in a position to answer us, we are told that it is due to the successful competition of the Americans, who beat our manufacturers sometimes in price, always in quality, and not unfrequently in both. English manufacturers are slow to adopt new patterns or to accommodate themselves to the wants of their customers, but their American competitors spare themselves no pains or expense in this way. They are constantly on the look-out for novelty and improvement, and by good trade organization and close intercommunication they are always kept well posted up in what is being done by their rivals in other parts of the world. Their illustrated pattern books, which are distributed with lavish hand among their customers, are marvels of engraving and typography, and no amount of canvassing or advertising is spared to bring the merits of their productions before the world. Above all, the Americans take care that their goods shall correspond to sample, and be turned out in a finished and workmanlike manner, unlike those of many English makers, who never trouble themselves to inspect the work they send away."

Are Ants Civilized?

The October number of the *Quarterly Journal of Science* contains an article on "Our Six-footed Rivals," the ants, which may well cause us to believe that we are not the only rational and civilized beings on this globe.

Let us suppose that we were suddenly informed, on good authority, that there existed a race of beings who lived in domed habitations, aggregated together so as to form vast and populous cities, that they exercised jurisdiction over the adjoining territory, laid out regular roads, executed tunnels underneath the beds of river, stationed guards at the entrance of their towns, carefully removed any offensive matter, maintained a rural police, organized extensive hunting expeditions, at times even waged war upon neighboring communities, took prisoners and reduced them to a state of slavery; that they not merely stored up provisions with due care, but that they kept cattle and even cultivated the soil and gathered in the harvest. We should unquestionably regard these creatures as human beings who had made no small progress in civilization, and should ascribe their actions to reason.

Among the *hymenoptera* the lead is undoubtedly taken by the ants, which, like man, have a brain much more highly developed than that of the neighboring inferior groups. Perhaps the most elevated of the formicidæ family is the agricultural ant of western Texas. This species is, save man, the only creature which does not depend for its sustenance on the products of the chase or the spontaneous fruits of the earth. A colony of these ants will clear a tract of ground, some four feet in width, around their city, and remove all plants, stone, and rubbish. A species of minute grain, resembling rice, is sown therein and the field is carefully tilled, kept free from weeds, and guarded against marauding insects. When mature, the crop is reaped and the seeds dried and carried into the nest. If this is done near a larger city the latter regard it as an intrusion, and a fierce warfare results, which ends in the total destruction of one or the other side. The queens are treated with great attention and installed in royal apartments.

The ant government is communistic. In a formicary there is no trace of private property; the territory, the buildings, the stores, the booty, exist equally for the benefit of all. The family among them scarcely exists. Rarely is the union of the male and female extended beyond the actual intercourse, all provision for the future young devolving upon the latter alone, the former being speedily killed, as he is no longer of any use. The females are the larger, stronger, and more long lived. The workers and fighters are sexless; to them belongs the real government of the ant-hill, and they provide for its enlargement, well being, and defence.

Ants are sometimes very stupid in regard to small things, but in many instances they display remarkable sagacity. Mr. Belt, in his "Naturalist in Nicaragua," tells of a column of ants who were crossing a watercourse by a small branch not thicker than a goose quill. They widened this natural bridge to three times its width by a number of ants clinging to it and to each other on each side, over which the column passed four deep, thus effecting a great saving of time. Again, the *eciton legnionis*, when attacking the hill of another species, digs mines and passes the pellets of earth from ant to ant until placed at a sufficient distance outside to prevent it rolling back into the hole. Their errors and stupidity are not more conspicuous, however, than among the human beings.

These tiny creatures have a language by which they can impart to each other information of a very definite character,

and not merely general signals, such as those of alarm. It has been found that ants fetched by a messenger seem, when they arrive at the spot, to have some knowledge of the task which is awaiting them. Their principal organs of speech are doubtless the antennæ; with these, when seeking to communicate intelligence, they touch each other in a variety of ways. There is a possibility that they may have a language of odors, for the various scents given off by them are easily perceptible. Under the influence of anger it becomes very intense. In battles how, save by scent, can they distinguish friend from foe? After a lapse of several months a former companion will be received kindly into the nest, but a stranger is killed.

More wonderful than their intelligence is their organization. If separate they would be helpless, and probably soon become extinct. Mr. Belt observed a marching column of *ecitons* in the primeval forests of Nicaragua. A dense body of ants, four yards wide, moved rapidly in one direction, examining every cranny and fallen leaf. At intervals larger and lighter colored individuals would often stop and run a little backward, apparently giving orders. On the flanks and in advance of the main body, smaller columns would push out, which pursued the cockroaches, grasshoppers, and spiders in the neighborhood. A grasshopper seeking to escape would often leap into the midst of the ants. After a few ineffectual jumps, with ants clinging to its body, it would soon be torn to pieces. Spiders and bugs which climbed to the tops of trees were followed and shared a like fate. In Nicaragua the vegetarian ants eat up trees and carry off the leaves, to use as a manure, in which grows a minute species of fungus, on which they feed. They evince a mutual sympathy and helpfulness, which to an equal extent can be traced in man alone. Mr. Belt placed a little stone on one to secure it. The next ant that approached ran back in an agitated manner and communicated the intelligence to others. They rushed to the rescue: some bit at the stone, and tried to move it, others seized the prisoners by the legs and pulled. They persevered until they got the captive free.

In Australia they have been known to bury their dead with some degree of formality. The Texan ant removes any offensive matter placed near its city and carries it away. Ants who refuse to work are put to death. Prisoners are brought in by a fellow citizen, handed over in a very rough manner to the guards, who carry off the offenders into the underground passages.

The slave-making propensity and the reliance upon slaves occur in several species, but not to the same degree. The *polyergus rufescens* is absolutely dependent on its slaves, and would rather die than work. *Formica sanguinea*, on the other hand, has much fewer slaves, being itself capable of working as well as fighting. No less variation may be traced in the habits of the cattle-keeping ants. Of the honey-secreting *aphides* and *cocci* that serve them as milch kine, some have large herds, whilst others have none at all, and if they encounter an *aphis* straightway kill and eat it. These *aphides* are extremely destructive to fruits and trees, as they live by sucking the sap. The ants watch them with wonderful care, and defend them from all enemies.

Instances of sagacity and design might be easily multiplied. Careful observation has shown that the ants are evolving as fast as their short terms of life will permit them. They are becoming more wise and more civilized yearly. Each century marks an advance. Who knows but that perhaps in the dim future they may assert rights which human beings shall be bound to respect?

Mushroom Ketchup.

Place agarics of as large a size as you can procure (not worm eaten), layer by layer in a deep pan, sprinkling each layer as it is put in with a little salt; the next day stir them up several times so as to mash and extract their juice. On the third day strain off the liquor, measure, and boil for ten minutes, and then to every pint bottle of the liquor add $\frac{1}{2}$ oz. of black pepper, $\frac{1}{2}$ oz. of bruised ginger root, a blade of mace, a clove or two, and a teaspoonful of mustard seed; boil again for half an hour, put in two or three bay leaves, and set aside until quite cold; pass through a strainer and bottle, cork well, and dip the ends in resin. A very little Chili vinegar is an improvement, and some add a glass of port wine or a glass of strong ale to every bottle. Care should be taken that the spice is not added so abundantly as to overpower the true flavor of the mushrooms.

Asparagus Paper.

According to the *British Mercantile Gazette*, an excellent paper can be made out of the white ends of asparagus, which consist entirely of tough vegetable fibers. The material is adapted to the production of the finer kinds of writing paper.

NEW BOOKS AND PUBLICATIONS.

OUR COMMON INSECTS. By A. S. Packard, Jr. Illustrated. Estes & Lauriat, Publishers, 301 Washington street, Boston.

This is mainly a reprint of a series of popular papers on insects which appeared in the *American Naturalist*, from 1867 to 1871. Mr. Packard has devoted considerable attention to popularize entomological knowledge, and has already published several works similar to this. The descriptions of the various insects treated in the present volume are very full, notably free from technicalities and are abundantly illustrated. The chapter on the ancestry of insects wherein the strong genetic bond uniting the worms crustacea and insects is traced, and the various steps of the evolution of the articulate division of the insect kingdom pointed out, will be read with especial interest by all naturalists, while the insect calendar wherein the times of the appearance of injurious insects are noticed will be of much value to the farmer.

OUTLINES OF MODERN ORGANIC CHEMISTRY. By Professor C. Gilbert Wheeler, of the University of Chicago. A. S. Barnes & Co., New York city and Chicago.

A simple treatise on the science, partially based on Riches *Manuel de Chimie*, and especially adapted to the uses of colleges and schools, where extended study of the subject is not included in the course. It is in harmony with the most recent advances, and is concisely and clearly written.

THE SPORTSMAN'S NOTE BOOK. By Wakeman Holberton, 102 Nassau street, New York.

This a convenient little book bound in soft covers for use by sportsmen. It contains blank pages for a diary, blank scores for rifle matches, game scores, and valuable advice in regard to guns, fishing tackle, camp cookery, receipts for accidental wounds, and a condensed record of game laws and seasons in all the States.

THE TELEPHONE. An account of the Phenomena of Electricity, Magnetism, and Sound, as involved in its action; with directions for making a speaking telephone. Professor A. E. Dolbear, Tufts College. Lee & Shepard, Boston. Illustrated.

Professor Dolbear has written this small book to meet the public want for a clear and concise explanation of the telephone. He makes plain the phenomena of electricity, magnetism and sound, and the numerous cuts inserted render the mechanical conditions intelligible. As the inventor of the magneto-electric speaking telephone, he describes at length his first instrument and gives directions to make an improved pattern. The book contains a great deal of useful information.

THE COUNTRY is the title of a new weekly journal devoted to the dog, the gun, yachting, fishing, etc., and published by "the Country" Publishing Association, No. 36 Murray street, this city. The first number before us has a capital table of contents. There are practical articles on training dogs, which abound in valuable suggestions; the correspondents columns are well filled with letters evidently prepared by men who know how to write as well as they understand handling gun and rod, and in a word the entire paper is bright, lively, and thoroughly interesting. Its aim is to deal with everything relating to the country, and with outdoor sports of all kinds. It is handsomely gotten up, and is well illustrated. We can bid the new comer a cordial welcome, and can commend it to our readers who are interested in outdoor sports. The subscription price is but 3 dollars a year.

Recent American and Foreign Patents.

Notice to Patentees.

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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 MECHANICAL AND ENGINEERING INVENTIONS.

IMPROVED MACHINE FOR CROCHETING THE TOPS OF HOSIERY GOODS.

Joseph M. Merrow, Merrow Station, Conn.—This invention relates to a machine for crocheting or over stitching the top or edge of hosiery or knit goods, and it consists in certain improvements upon that type of machine in which a reciprocating needle carries the yarn or thread through the goods as advanced by a feed, while a hook forms a stitch by looping the thread above and below the work plate. The stitch, consisting of a loop from above the fabric and a loop from below the fabric, of two adjacent stitches having drawn through them a loop from the next stitch in order, is peculiar to this machine, and forms an elastic and ornamental finish for the edge of the work. This stitch is also adapted to joining or overseaming the edges of work, forming a strong seam, which is fully as elastic as the goods in which it is made.

IMPROVED PISTON PACKING.

J. H. Ferdinand Otto, Reedsville, Wis.—This invention relates to improvements in metallic piston packing, by which the packing rings are readily adjusted to the required degree of tightness by a simple mechanism. The inner and outer split packing rings of the piston are guided between the end plates and expanded by three or more interior band springs. These springs are operated upon by sliding nuts that are moved forward or back by means of radial screws, which are operated by a worm gear. The shafts of the intermeshing pinions pass parallel to the piston rod into inner sockets of the face plate, which is attached by screw bolts to the body of the piston. The sliding nut is guided between lugs on the inside faces of piston head and follower. The socket openings of the face plate are closed by short cap screws, which admit, when removed, the engaging of the key with the nicked ends of the pinion shaft, so as to turn the same and sets the springs and rings to the required degree of expansion.

IMPROVED TOOL POST FOR LATHES.

Robert Neasham, Mount Washington (Pittsburgh), Pa.—This relates to tool posts for engine lathes and similar tools, and it consists of a support for the tool which is made in two parts, the upper part being screwed into the lower part, and capable of being raised or lowered by turning the said lower part. The tool post passes through the support, and is mortised to receive the tool, which is clamped by a set screw in the usual way.

IMPROVED RAILWAY SWITCH SIGNAL.

George W. Anders, Woodsboro, Md.—The object of this invention is to provide an improved signal to indicate the position of the movable rails of a switch in the night time for the purpose of informing the engineer of an approaching train that the switch is open or closed, as the case may be. The invention consists in attaching to the switch lever a lantern having differently colored glass panes, and provided with a swinging lamp whose position in front of one or another of the colored panes indicates the position of the lever, and thereby the position of the switch rails also. The invention further consists in the particular construction of the lantern and swinging lamp.

IMPROVED COMBINED CRANK AND TREADLE POWER FOR DRIVING SAWS AND OTHER LIGHT MACHINERY.

Henry Shear, Arcola, Ill., assignor to himself and Edward Cornthwait, of same place.—The ends of the shaft, which revolves in bearings attached to the upper rear part of the frame, project at the sides of the frame, and to them are attached the cranks, which are made with an offset, forming a second crank. To the inner and shorter cranks are pivoted the ends of the connecting rods, the lower ends of which are pivoted to the ends of the treadles. The treadles are pivoted at their centers to pins attached to the lower part of the frame. To the driving shaft is attached a pulley, which is made large and heavy to adapt it to serve also as a flywheel, and around which is passed a band. The band also passes around a pulley attached to another shaft, which revolves in bearings attached to the upper part of the frame. In using the machine a man stands upon each treadle with a foot near each end, and grasps the crank with his hands. Then, by the natural motion of turning the crank his weight will be thrown alternately upon the opposite ends of the treadle.

IMPROVED SPARK ARRESTER.

John A. Blair and William C. Bush, Fair Hill, Md.—The object of this invention is to provide an improved spark and cinder catcher for locomotives and other engines which will catch the cinders and conduct them to

the ground. The smokestack is slightly contracted at its upper end, and is surrounded by an annular concave receiver, which is fitted with a truncated sheet metal cone. Within this cone a similar cone is suspended by rods over the upper end of the smoke stack, with its lower edge projecting downward a short distance below and outside. At the sides of the smokestack there are pipes which are enlarged at their upper ends, and are connected with the receiver. The sparks and cinders that are projected upward by the exhaust of the engine are directed by the converging top of the smokestack against the inner cone, by which they are deflected so that they strike the inner surface of the outer cone, from which they drop into the receiver and are delivered to the pipes, by which they are carried downward below the boiler and permitted to escape to the ground.

IMPROVED SLIDE-VALVE ADJUSTER.

Henry B. Doolittle, Doolittle's Mills, Ind.—This invention relates to means for adjusting the strokes of the slide valves of reciprocating high pressure engines, and consists in an attachment for steam engines which is applicable to the arm of the rock shaft, and constructed with an adjustable slide having a wrist pin to connect with the rod of an eccentric on the main shaft. The object is to adapt a valve adjuster to engines as now constructed, so that the adjuster can be attached to the arm of the rock shaft without in any manner altering the engine.

NEW MISCELLANEOUS INVENTIONS.

IMPROVED LADDER.

Moses Foss, Cairo, Ill.—This ladder is made in two sections, and can be used as a step ladder. By a peculiar arrangement the two sections can be so constructed as to convert them into a long straight ladder. One section is so formed that the lower end is curved and notched, so that when the two sections are put together to form a long ladder, the upper section will be nearly in a plane parallel to the lower section, and the curved portion of the upper section will have a bearing against hooks, and will be firmly held by these hooks and the top round, which is received into the notches.

IMPROVED STOVE.

Moses Jones, Hymer, Kan.—The firebox or inner shell is made of cast iron, and is provided with a top that extends to the outer shell. The outer shell is of sheet iron, and is higher than the firebox, and to it a cast iron top is secured. Between the top and the top of the firebox there is a flue, and below the top and around the sides of the firebox there is another flue. Slits are made in the back of the firebox, through which the products of combustion pass from the firebox to the flue. By opening the damper the smoke is permitted to escape directly to the chimney; and when it is closed the products of combustion pass through slits and a flue around the sides of the firebox to the front of the stove, where they pass upward through openings in the flue, and thence to the stovepipe. This arrangement not only utilizes the greatest possible amount of heat, but it also prevents the stovepipe from becoming dangerously heated.

IMPROVED TINNING APPARATUS.

John B. Jones, Brooklyn, N. Y.—In the operation of tinning five vessels or compartments are used. In this improved apparatus vessel the partition between two vessels is taken away, so that these become one vessel, and a shallow surface compartment is secured in the upper part of the vessel, the lower edge of which extends down a little into the melted tin, so as to confine the flux contained in it and prevent it from entering the other vessel and injuring the flux in said vessel. With this construction the goods are pushed along in the vessel without being raised out of the melted tin, and thus the necessity of dipping the flux back and forth is avoided.

IMPROVED GAME COUNTER.

Joseph H. Tahony, New Orleans, La.—This is an improved game counter more particularly designed for keeping count of the game in card playing, but applicable also for all other games which require a count. The object of the invention is to provide a neat and simple device for the purpose, to be used in the place of a pencil and slate, checks, or other commonly employed means of counting, and to this end the improvements consist, first, in arranging in a small box one or more disks bearing numbers on their peripheries and arranged on a shaft with a tension spring, so that as the disks are turned, from time to time, the numbers successively show through a slot in the top of the box, the disks being turned either by pressure upon their exposed surfaces or by specially provided means. The invention also consists in combining a set of these boxes with a partitioned tray adapted to receive said boxes, and also a pack of cards.

IMPROVED BUZZ TOY.

Stuart A. Standiford, Philadelphia, Pa., assignor to Mrs. M. L. Standiford, of same place.—This invention consists of a disk secured to a sleeve which is placed on a wire attached to a suitable handle. The wire is bent over the sleeve toward the disk, and in its outer end an eye is formed, through which a cord passes that is attached to the disk and wound around the sleeve. By pulling the cord the disk is made to rotate first in one direction and then in the other. It forms quite an attractive toy.

IMPROVED TOOL HANDLE.

John H. Anthony, Camanche, Iowa.—This invention furnishes improved fastenings for securing tools or hand pieces to handles. It is so constructed as to enable the said tools or hand pieces to be applied to new handles easily and quickly, so as to avoid loss of time and expense, while it holds the said tools and hand pieces firmly and securely. By screwing a screw ferrule inward upon the handle until the clamps are uncovered the tool and handle can be readily separated, so that the tool may be readily supplied with a new handle.

IMPROVED NAPKIN HOLDER.

Ephraim Mears, Terre Haute, Ind., assignor to himself and Samuel M. Young of same place.—This consists of a hook to which two arms are pivoted, which open horizontally, and are provided at their free ends with hooks for receiving the napkin. The object is to provide a napkin holder which will spread the napkin, so that it will more thoroughly protect the clothing.

IMPROVED SKATE HOLDER.

Ewen C. Henderson, Pictou, Nova Scotia, assignor to himself and Henry Fraser, of same place.—In using this device the toe of the skate runner is inserted between the lower parts of plates, and is then pushed upward between two springs. As the springs reach an opening in the runners their ends spring through it, so that the skates may hang upon the crossed upper parts of said springs. The skates are detached by pushing them upward and out at the upper end of the holder. When the skates are detached the holder may be readily carried in the pocket.

IMPROVED MACHINE FOR CHAMFERING AND CROZING STAVES.

Benjamin W. Sutherland, Wykoff, Minn.—The object of this invention is to produce an improved simple, but effective, machine for chamfering, levelling, and crozing the ends of barrels or other casks. The invention relates to means for adjusting the chuck that holds the end of a barrel for the purpose of centering it with reference to the cutter head; for chamfering the barrel upon the sliding carriage, for forcing the barrel end into the annular chuck, and for chamfering, leveling, and crozing the barrel.

IMPROVED CENTERBOARD FOR VESSELS.

Stephen R. Babbridge, Rockland, Me.—This centerboard may be adjusted to equalize the center of resistance with the center of pressure from the sails, to prevent carrying a weather or lee helm. Horizontal grooves are formed in the sides of the well or trunk to receive the pin attached to the lower forward corner of the centerboard, to enable said centerboard

to be adjusted horizontally. Vertical or inclined grooves are formed in the sides of the well, in connection with the horizontal grooves, and a pin is attached to the lower forward corner of the centerboard, to enable the said centerboard to be shipped and unshipped from the deck.

IMPROVED HEAD REST.

Isaac L. Peckham, Bangor, Me.—This is an adjustable head rest for passenger cars and steamboats, and consists of a rack plate attached to the wall or other support, and guiding a vertically adjustable plate that is secured by pawl and thumb nut, the said plate carrying a bracket with horizontally turning and clamped head rest. The whole device is made of suitable cast metal, to be manufactured at reasonable expense.

IMPROVED GALVANIC BATTERY.

Charles A. Hussey, New York city.—This invention is intended to produce a single-fluid battery of constant strength for running electromotors for light machinery, and all other purposes in which a constant current is required. The battery dispenses with the use of double-fluid batteries for these purposes, and consequently with the use of porous cups and other objectionable features of the same, while, it is claimed, providing a cheaper and more constant current than a two-fluid battery. The elements are made in the shape of disks or otherwise, and mounted upon the shaft and revolved therewith. As only a part of the plates at the time is immersed into the fluid, which part almost instantly emerges again from the same by the rotating motion imparted, and, as the hydrogen gas collected thereon is lighter than the atmospheric air, the surface covering of hydrogen is continually dissipated during the revolution of the plates in the air, and the plates kept free from polarization. Thus a current of constant strength is obtained, and a battery provided that may be used with equal efficacy at any moment.

IMPROVED OAR.

James W. Wall, Cleveland, O.—This consists in a combination of jointed and pivoted oar sections and base plate, having end slot and hole, with a cross catch pin and binding spring of a stationary strip of the gunwale, to admit oscillating motion of oar, and ready shipping and unshipping of the same. The noiselessness and ease by which the oar is worked, and the simple mode of shipping and unshipping the same from the strip of the gunwale, are special advantages.

IMPROVED TILE-LAYING MACHINE.

James H. Sparkes, Clinton, Ill.—This machine is so constructed as to open a channel to receive the tile and lay the tile in said channel as the machine is drawn forward. The mechanism is simple and ingenious.

IMPROVED SHOE FASTENER.

Victor Nivois, New York city.—This consists of a single wire bent into a zigzag spring, and having formed in it at intervals loops, which are bent backward or returned upon themselves. The lower end of the fastener is attached to the shoe by eyes, and placed between the lining and the upper, the loops projecting through the lining to receive a hook sewed to the upper of the shoe. This hook is formed from a doubled wire. The device forms a convenient and efficient fastening.

IMPROVED SHOWER BATH.

James R. R. Morford, La Harpe, Ill.—By giving vertical motion of a rod and its plunger water is drawn into a tube and forced therefrom through a rose. In the center of the rose or sprinkler is a staple, on which is applied an anti-friction sleeve, over which passes the strip that is used for raising and lowering a screen. Said screen may be made of any suitable waterproof fabric, and it has hoops secured to its ends and an opening through its side for the entrance and exit of a person. The lower end of the screen is held under hooks fixed to the tub, and the upper end has suspension cords attached to it, which are fastened to the strap. By these means the screen can be raised and lowered, and when raised it can be held tight.

IMPROVED FIRE ESCAPE.

Joseph Davenport, Massillon, O.—Upon a platform four T-shaped guides are secured, which are placed at right angles to each other, and upon each of which a slide is arranged. Four sets of bars are joined together to form lazy-tongs, and are secured together at their outer joints by curved pieces. The bars of each series thus unite diminish in length toward the top of the series, so that all, when united, form a structure of pyramidal shape. Levers are pivoted in standards attached to the platform, and extend outward under the central joint of the lower bars and inward under a plate. Pulleys are journaled between ears projecting from the under surface of the plate. Ropes are attached to the slides and run over the pulleys and downward to a windlass under the platform, to which windlass they are attached. The windlass has upon it a spur wheel that is driven by a pinion on a shaft, which is journaled to the truck frame, and is provided with cranks. At the top a basket is suspended by cords. By turning the windlass the rope is drawn over the pulley and the slides are drawn toward the center of the platform, and at the same time the plate is drawn downward, carrying with it the inner ends of the levers, the outer ends raising and carrying with them the lower pairs of jointed bars, causing the four series of bars to move upward, carrying with them a basket.

NEW AGRICULTURAL INVENTIONS.

IMPROVED GANG PLOW.

Daniel M. Funk, Harrisburg, Oregon.—The object of this invention is to furnish an improved gang plow, which shall be so constructed that it may be adjusted to work at any desired depth in the ground, which may have the pitch of the plows changed as hard and soft places occur without having its adjustment changed, which will enable the plows to be readily raised from the ground for convenience in passing from place to place, which will allow each plow to rise independently of the others to pass obstructions, and which shall be simple in construction, readily controlled, and may turn a square corner without having the plows raised from the ground.

IMPROVED COTTON HARVESTER.

Ferdinand Van Dorn, Basking Ridge, N. J.—The object of this invention is to furnish a machine for removing the cotton from the ripe bolls, by means of a current of air produced by a revolving fan, without injuring the unripe bolls or the plants, and deliver the fiber clean and free from leaves and other impurities ready for ginning. The air and cotton enter a sack, the force of the blast being so weakened by the gauze of the spout and the gauze of the sack that the cotton sinks to the bottom of the sack while the current of air passes around the inner edge of a partition and out through the open part of the front opening of the sack. Any cotton that may be carried out by the air will settle down in front of the machine, and be again drawn through it. The cotton is removed from the sack when required through an opening between the rear edge of its bottom and the lower edge of its rear side.

IMPROVED ADJUSTABLE HARROW, GROUND MARKER, AND CORN CULTIVATOR.

George E. Cooke, Rossville, Kan.—The object of this invention is to furnish an improved machine, which shall be so constructed that it may be used as an ordinary harrow for preparing the soil, for marking the ground for planting, and for cultivating small plants, and which may be adjusted to any desired width, and may be readily raised from the ground to clear it of rubbish, and for passing from place to place. To the upright part of the bar, near its lower end, is attached a coupling, to which the double tree is attached, several holes being formed in the said upright part to receive the bolt that secures the coupling to it, so that the point of draft attachment may be adjusted higher or lower, as may be desired. Several

holes are formed in the bar to receive the pin, so that the crosshead can be readily moved forward or back to adjust the harrow wider or narrower, as may be desired. By operating a lever the harrow may be raised and lowered and adjusted to work at any desired depth in the ground.

IMPROVED GATE.

Irvin Yost, Thornville, O.—This invention relates to an improvement in that class of farm gates which are pivoted in such a manner as to swing in a vertical plane, and thus avoid obstruction by snow and ice, and also admit of easy operation by means of levers extending either way from the gate, at right angles thereto. The invention particularly relates to the construction and arrangement of the devices for latching and unlatching the gate, and also counterbalancing and operating the same. (For details, see patent.)

IMPROVED ZIGZAG FENCE.

Nathan H. Hamlet, Wabash, Va.—This is a new zigzag or worm fence, which may be made stronger and cheaper than hitherto. The nature of the invention consists in notching together the top rails of the sections, and securing the rails to posts or battens arranged in the crotches formed by the lapping or crossing of the rails.

IMPROVED MEAL BIN.

John C. Durbin, Columbus Junction, Iowa.—The object of this invention is to furnish for kitchen use an improved flour chest for storing the flour, sifting the same, and providing receptacles for the different articles, the same having a hinged molding board and space for all the parts required for making bread, pastry, etc., in one convenient piece of furniture.

IMPROVED GATE.

Robert A. Horning, Karns City, Pa.—This consists of a folding gate made on the lazy-tongs principle, and swinging on a fixed lower and a turning upper pivot by means of double folding levers secured centrally to the front end of the gate. The rear ends of the double folding levers are connected by a slotted pivoted piece with an upright weighted rod, which is operated to open or close the gate by links, levers, and handles extending at both sides of the gate along the road. The double folding levers are joined by connecting bands and pivots, and prevent the sagging of the gate when closed. The connecting crossrod of the double levers locks the gate automatically into recesses of the gate posts.

IMPROVED RING AND PULLEY FOR NECK YOKES.

Samuel M. Palmer, Glens Falls, N. Y., assignor to Walter McDonald, of same place.—This consists of a ring fitted with a pulley having flanges for retaining the strap that passes around it. A guard, consisting of two disks, is perforated to receive the ring and connected by a strap which is bent twice at right angles, forming, together with the face of the pulley, an aperture, through which the pulley strap passes around the pulley.

IMPROVED SEED PLANTER.

William S. Barton, Orangeburg, S. C.—This invention consists in the combination of the valve, provided with the double cam, the prongs of unequal length, the pivoted lever, and the open keeper with the wheel and with the rounds of the handle. The beams are made short and the rear ends are attached to the handles, between which is pivoted the dropping wheel. This wheel is made in the form of two cup-shaped disks, which are placed with their concaved sides toward each other, and are connected together by bolts passing through them near their edges. In the adjacent edges of the disks of the wheel are formed holes, which are closed upon the outer sides by valves rigidly attached to double cams, which are pivoted to the wheel. A lever is pivoted to a crossbar attached to the lower part of the handles, and to the lower end of which are attached two prongs. The prongs are made of different lengths, and are so arranged that an end of the longer one will strike the cam and open the valve just as it begins to rise from the ground. As the seed drops to the ground the shorter prong strikes the cam and closes the valve. The upper end of the lever passes through an open keeper attached to the upper crossbar of the handles, so that the lever can be turned to one side to move the prongs into such a position that they will not strike the cam, thus enabling the machine to be drawn from place to place without dropping seed.

IMPROVED WEED-FOLDING ATTACHMENT FOR PLOWS.

Thomas M. Harbert, Burlington, Kan.—This invention consists in a folder formed into bends, curves, and inclines, to adopt it to be attached to a plow beam for dividing, guiding, and folding down grass into the furrow. Upon the forward part of the plow beam a cast iron collar is secured, the lower part of which is formed into flanges for the folder to rest in. Upon the landside of the plow beam the fender is bent outward, and then downward to divide the grass, and extends back with a downward inclination nearly to the point of the plow, where it is bent obliquely toward the plowed land, so as to be nearly parallel with the moldboard, to cause it to bend down the grass upon the furrow slice.

NEW HOUSEHOLD INVENTIONS.

IMPROVED DUMB WAITER.

James Murtaugh, New York city.—This invention relates to that class of elevators known as "dumb waiters;" and the nature of the invention consists in so constructing a dumb waiter in a building that it can be conveniently used by different families residing in the several stories of the building and in adjacent apartments on the same "flat." Around the brake wheels are applied brake straps, the ends of which are connected to the angular ends of levers, having their fulcrum on the horizontal beams of the uprights. A weight hangs free and acts on the levers to free the brake straps from their wheels. By pulling on one of the ropes the brake strap of the lever connected to such rope will be drawn tightly around its drum or wheel. At the same time a weight will be raised. When this weight is released the weight on the rope opposite to that which was pulled will cause its lever to operate the brake strap. Thus it will be seen that both brakes are brought into operation by drawing on either one of the ropes. By this arrangement a single elevator or dumb waiter will answer for a number of tenants living in separate apartments.

IMPROVED FOLDING CHAIR.

Charles H. Sutherland, Brownsburg, Va.—This invention relates to an improvement in the class of folding chairs whose back pieces and legs are detachably connected. The improvement relates to the use of hinged or pivoted arms, which are adapted to be detachably connected with the back pieces of the chair, and thus lock the several movable parts of the frame in the open or extended position. A foot board is pivoted to the rockers to adapt it to be folded back out of the way, or to be extended to support the feet of the occupant of the chair.

IMPROVED KITCHEN CABINET.

George P. Ziegler, York, Pa.—This article of furniture is designed to embody in compact form various kitchen utensils and storage compartments, such as sink bench, table, kneading trough and board, ironing board, meal and spice drawers, knife and rolling pin boxes, flour chest, etc. The novel feature consists in combining with the hinged cover a hinged leaf having strips upon one side to form a sink bench and a plain surface upon the other, which plain surface of leaf co-operates with a second leaf, hinged to the opposite side of the cover, to form a table.

IMPROVED STAND FOR SMOOTHING FABRICS.

John F. Freese, Baltimore, Md.—This consists in an adjustable frame or smoothing board, which is pivoted to standards and constructed with a metallic surface, on which the moist and starched fabrics are smoothed and dried. It will be found, on removing them, that they are smoothed and glossed as though they were ironed.