

ery. We think the operations of this company show clearly that safety from boiler explosions can be obtained by careful inspection at frequent intervals, and careful management at all times, neither plan by itself constituting a sure preventive. Not the least among the results of the company's work is the clear demonstration of the fact that the hydraulic test alone will not reveal all the defects of a boiler; and, as we have frequently pointed out, when it is made with cold water it sometimes produces defects which did not formerly exist.

[For the Scientific American.]

OCCUPATION AND THE DEATH RATE IN ENGLAND.

A comparative study of the death rate in seventy-three of the principal employments in England and Wales has lately been made in the British Registrar-General's office, based on the mortality returns of three years. The results show, among other matters of interest, the mortality among all the males aged fifteen years and upwards, in each of the specified employments, and also the relative mortality in each, the mean death rate of the whole being taken as one hundred.

For example, in the three years under examination, the deaths among grocers amounted to three thousand one hundred and sixty. Had their death rate been equal to the mean death rate for all the employments during those years, as many as four thousand one hundred and seventy-three grocers would have died. The relative death rate of that class, therefore, in comparison with the whole, was only seventy-six.

But the grocers were surpassed in healthfulness by the members of two learned professions, the lawyers and the clergymen. The barristers head the list, with a death rate of only sixty-three; the clergy of the Established Church follow, with a death rate of seventy-one, while the independent Protestant denominations stand at seventy-five.

It is scarcely probable that the immunity of the barristers is altogether due to the lightness or wholesomeness of their work. That counts for much, but we must not forget to allow for the fact that in England a large number of independent gentlemen adopt that calling, not to make a living out of it by hard work, indeed not to work at all in it; but simply for the nominal professional rank it gives. If the working barristers only were counted, it is doubtful whether the class would stand so high in the sanitary list. Perhaps the refuge which the Established Church affords for many men of culture and leisured regular life may similarly help to account for its lower death rate as compared with that of other Protestant clergy.

Next after the barristers and the Protestant clergy come the grocers, already mentioned, followed by men of the combined occupation of grocer and shopkeeper, with a death rate of seventy-seven. After these we find gamekeepers, with a death rate of eighty; farmers, one of eighty-five; civil engineers, eighty-six; booksellers and publishers, eighty-seven; wheelwrights, eighty-eight; silk manufacturers, eighty-nine; carpenters and joiners, and common laborers, stand together in the list, at ninety-one; bankers at ninety-two; domestic servants, ninety-three; sawyers at ninety-five; musical instrument makers, paper manufacturers, and brass workers, at ninety-six; blacksmiths and gunsmiths at ninety-seven; tanners and curriers, shoemakers, and workers in iron and steel, ninety-eight; and bakers at ninety-nine, completing the group of occupations in which the death rate is below the mean.

Machinists and woolen workers die at the mean rate for all, one hundred. Then follow half a hundred employments, more and more destructive to life. Manufacturers in iron, copper, tin, and lead, with bakers and confectioners—probably what would be classed as fancy bakers here—exceed the mean mortality by one. The schoolmaster's calling, and the solicitor's, rank next in unhealthiness, their death rate being one hundred and two. Millers and Roman Catholic priests stand next, with a death rate three above the mean, and thirty-two above that of the clergy of the church of England: a notable circumstance, to say the least.

Why should the mortality among the Roman Catholic priesthood exceed so largely—nearly fifty per cent.—that of the English clergy? Are celibacy and asceticism the unsanitary conditions? Or shall we attribute their higher death rate to a more arduous and exposed life among the sick and squalid poor?

After the priests come watchmakers, one hundred and four; tobacconists, one hundred and five; physicians and shipbuilders, one hundred and six; messengers and porters, coach makers and rope makers, one hundred and seven; drapers, one hundred and eight; tailors, one hundred and nine; and workers in cotton, flax, and silk, the same. Chemists, druggists, and commercial travelers exceed the mean death rate by ten; clerks, insurance men, and butchers, by eleven; carvers and gilders, by twelve; farriers, by thirteen; miners, printers, and manufacturers of cotton and flax, by fifteen. It will be noticed that weavers and workers in silk are much the most healthy of all who have to do with textile fabrics, their death rate being eleven below the mean. Those that handle wool exhibit an average vitality, compared with all grades of working men. With the addition of cotton and flax to the fiber used the death rate rises to one hundred and nine; while those who handle flax and cotton without silk or wool die at the rate of one hundred and fifteen. Which is the more destructive to life in its working, cotton or flax, the statistics do not show.

Bookbinding is a degree more unhealthy than printing, the death rate of this class of workers being one hundred and sixteen. In glass manufacturers and fishmongers it rises to one hundred and nineteen; and in printers and

plumbers to one hundred and twenty. Quite a number of callings show a death rate of one hundred and twenty-one; namely, railway employees, dock laborers, tool makers, file makers, and saw makers. For the diverse causes of high mortality in their occupations, it is not needful to enquire. In hatters, coppersmiths, and needle makers, the rate rises to one hundred and twenty-three; and in manufacturing chemists, and dye and color manufactories, to one hundred and twenty-four. In hair dressers the mortality is more than double what it is in the legal profession, that is, one hundred and twenty-seven. Bargemen die at the rate of one hundred and twenty-nine, or twenty-nine above the standard death rate. The employments of carmen, dray men, horse-keepers, and grooms are still more fatal, the death rate being one hundred and thirty-one. In the next group, embracing potters, innkeepers, licensed victuallers, the mortality is thirty-eight above the standard; while in cabmen and coachmen (not domestic), the death rate rises to its highest, one hundred and forty-three, or twice that of the English clergy.

These figures show with practical accuracy the comparative mortality of the men engaged in these various employments. To considerable extent also, they represent the comparative healthfulness of the several callings; but the reader will readily see that many outside conditions conspire to affect the death rate in each. An easy and healthful calling may show a high death rate, simply because it is easy and comparatively favorable to life, and consequently attracts to itself the feeble and disabled. For example, the statistics of the Medical Department of the Provost Marshal General's Bureau, during our late war, shows that proportionally more watchmen were rejected for physical unfitness than men of any other employment. Yet the watchman's work is easy and not specially unhealthful: so easy, in fact, that the worn-out and crippled and diseased naturally gravitate to it.

That cabmen should show excessive mortality is rather to be expected. Their working hours are long and irregular; and they are exposed to all weathers under unfavorable conditions. It is not so apparent why the unexposed innkeepers and victuallers should die almost as rapidly. The clever author of "Diseases of Modern Life" charges their high death rate to drink. No doubt excessive indulgence does cut short the lives of very many. But we are inclined to think that the selective action of the business has much to answer for. A large proportion of the English innkeepers are men whose working days are past: men who have earned a little money as butlers, stable keepers, small traders, and the like, and find the inn, or "saloon," as we would call it, a sort of hospital for the physical incapacity.

Again, the mortality of hair dressers is relatively high, thirty per cent higher than that of blacksmiths. It can hardly be that their business is in itself so much more killing, notwithstanding the hot and ill ventilated rooms they usually occupy. It is another case, we think, of natural selection. Out of a hundred boys fated to be blacksmiths and barbers, there is little doubt that the majority of the sturdy ones will gravitate to the blacksmith shop, the majority of the undersized and feeble ones to the barber's.

In another article we propose to examine the relative healthfulness of the different employments of men in this country. The results are in many respects curiously unlike those derived from the English statistics. R.

The Meeting of the American Association for the Advancement of Science.

The annual meeting of this association convened at Buffalo, N. Y., on August 23. There is a remarkably large attendance, not only of American scientists, but of scientific men from Europe, who are on a visit over here to the Centennial. The proceedings were formally opened in the Common Council Chamber of the City Hall by a speech by the retiring president, Professor G. S. Hilgard. This was followed by a brief address by the new president, Professor William B. Rogers, after which a formal welcome was extended to the Association by the Mayor of Buffalo and influential citizens. These proceedings, together with the work of electing a standing committee and the reading of a few papers, which will be referred to in the abstracts which we shall publish next week, occupied the attention of the scientists for the first day. On the ensuing morning Professor Huxley arrived, and, after receiving an enthusiastic welcome, addressed the assembly substantially as follows. After gracefully returning thanks for the reception accorded him, he stated that he had no scientific matter to communicate, and in that respect was unprepared, but that, to satisfy a curiosity which he had noticed to be especially developed among us, he would state briefly his impressions of the country.

PROFESSOR HUXLEY'S ADDRESS.

"Since my arrival," he continued, "I have learned a great many things, more, I think, than ever before in an equal space of time in my life. In England, we have always taken a lively interest in America; but I think no Englishman who has not had the good fortune to visit America has any real conception of the activity of the population, the enormous distances which separate the great centers; and least of all do Englishmen understand how identical is the great basis of character on both sides of the Atlantic. An Englishman with whom I have been talking since my arrival says: "I cannot find that I am abroad." The great features of your country are all such as I am familiar with in parts of England and Scotland. Your beautiful Hudson reminds me of a Scotch lake. The marks of glaciation in your hills remind me of those in Scottish highlands.

"I had heard of the degeneration of your stock from the

English type. I have not perceived it. Some years ago one of your most distinguished men of letters, equally loved and admired in England and America, expressed an opinion which touched English feeling somewhat keenly—that there was a difference between your women and ours after reaching a certain age. He said our English women were "beefy." That is his word, not mine. Well, I have studied the aspect of the people that I have met here in steamboats and railway carriages, and I meet with just the same faces, the main difference as to the men being in the way of shaving. Though I should be sorry to use the word which Hawthorne did, yet, in respect to stature for fine portly women, I think the average here fully as great as on the other side. Some people talk of the injurious influence of climate. I have seen no trace of the "North American type." You have among you the virtue which is most notable among savages, that of hospitality. You take us to a bountiful dinner and are not quite satisfied unless we take away with us the plates and spoons. Another feature has impressed itself upon me. I have visited some of your great universities and meet men as well known in the old world as in the new. I find certain differences here. The English universities are the product of Government, yours of private munificence. That among us is almost unknown. The general notion of an Englishman when he gets rich is to found an estate and benefit his family. The general notion of an American when fortunate is to do something for the good of the people and from which benefits shall continue to flow. The latter is the nobler ambition.

"It is popularly said abroad that you have no antiquities in America. If you talk about the trumpery of three or four thousand years of history, it is true. But, in the large sense, as referring to times before man made his momentary appearance, America is the place to study the antiquities of the globe. The reality of the enormous amount of material here has far surpassed my anticipation. I have studied the collection gathered by Professor Marsh, at New Haven. There is none like it in Europe, not only in extent of time covered, but by reason of its bearing on the problem of evolution; whereas before this collection was made, evolution was a matter of speculative reasoning, it is now a matter of fact and history, as much as the monuments of Egypt. In that collection are the facts of succession of forms and the history of their evolution. All that remains to be asked is how, and that is a subordinate question. With such matters as this before my mind, you will excuse me if I cannot find thoughts appropriate to this occasion. I would that I might have offered something more worthy; but I hope that your association may do what the British Association is doing—may sow the seeds of scientific inquiry in your cities and villages, whence shall arise a process of natural selection by which those minds best fitted for the task may be led to help on the work in which we are interested. Again I thank you for your excessive courtesy and, I may almost say, affectionate reception."

The Traveler Ropes of the Brooklyn Bridge.

The joining of the two ends of the first traveler rope, whereby the material for constructing the East River Bridge is to be transported over the river, was recently accomplished. The endless chain is now complete, passing over grooved pulleys on the towers. It is operated by the engine formerly used to elevate stone during the process of erection of the piers. At the time we write, the first section of the second traveling rope is about to be carried over the river. This is made fast to the rope now in position and run over by it. It is lashed to the first rope at regular distances of 50 or 60 feet, as it leaves the Brooklyn anchor pier; and when it is across, these fastenings will have to be cut. This is done by a man sent over in a "buggy," which is a small platform hung upon the traveler rope by deeply grooved wheels. It is surrounded by a railing, inside of which the workman will stand, cutting the lashings as he rides across. The ride down to the center of the traveler rope will be controlled with a hempen rope, and the "buggy" will be hauled up the opposite incline with another. There will be nothing perilous in the process if the workman can keep from dizziness, nor more danger than in a great many other stages of the work.

In order to inspire confidence in the men who are to perform the undertaking, Mr. E. F. Farrington, master mechanic of the bridge, recently crossed from the Brooklyn anchorage to the New York pier, seated on a boatswain's chair, or swing, attached to the moving rope. The trip was rapidly and safely accomplished in the presence of a large and enthusiastic crowd. Mr. Farrington, now the first man who has crossed the bridge, was also the first who traversed the spans at Cincinnati and Niagara.

Recent American and Foreign Patents.

NEW MECHANICAL AND ENGINEERING INVENTIONS.

IMPROVEMENT IN FEEDING PULVERIZED FUEL TO FURNACES.
Allin Cockrell, Lamar, Mo.—This consists of a fan blower combined with a furnace in such manner as to feed it with a constant and regular supply of fuel, and having a conveyor for supplying the fuel to it from a mill in which it is ground, or from a feeding hopper to be supplied with previously pulverized culm, tan bark, sawdust, or the like.

IMPROVED EXPANDING METAL DRILL.
Patrick Duffy, New Bedford, Mass., assignor to himself and James F. Powers, same place.—Two cutters, fixed in the stock to slide forward and backward transversely, are slotted obliquely and reversely to each other. The fastening bolt by which they are secured to the stock is fitted in said slots, and also fitted in a vertical slot in the stock, so that, by shifting the bolt along the slots in one direction, the cutters will be adjusted onward; by shifting the bolt the other way, they will be adjusted inward.

APPARATUS FOR CUTTING AND ORNAMENTS SHOE UPPERS.

Edwin B. Stimpson, Brooklyn, N. Y.—This consists essentially of a series of small punches, one or more large punches, a bed die, and a stripper, contrived in the ordinary way of punching machines, for making ornamental figures in the uppers of shoes. The steel die plate is riveted to an iron plate, the object of which is to combine with the die plate a sufficient body of metal, that will not crack in cooling. The stripper is suspended from the head of the press by springs to raise it out of the way of handling the goods after the goods are cut. The marking plate has small points for marking imitation stitches, and there are broad punches for cutting out long strips made concave on the cutting end.

IMPROVED LUBRICATOR.

Simon Smith and Isaac S. Collins, Mauch Chunk, Pa.—This is a horizontally feeding oil cup for parts of steam engines, which can be regulated to feed a greater or less quantity of oil when the engine is in motion, but which discontinues the oil supply when the engine is stopped. It consists of a horizontal cup of cylindrical shape, with tightly seated glass head. The feeding mechanism consists of a horizontal reciprocating pin, guided in suitable manner, and having recesses that take up the oil from supply perforations and convey it to the feed tube at each oscillation of the part of the engine to which the lubricator is attached.

IMPROVED GRINDING MILL.

Enoch Moore and David Moore, Mooreville, Iowa.—These inventors propose to provide a supporting plate, with a recess, on which they locate the rocking plate resting on the pivots in the bottom of the recess. The stone on the under side of it rests on other pivots. By this arrangement, sufficient space is secured between the beams without cutting or weakening them.

IMPROVED COMBINATION LOCK.

Isaac D. Sibley, Huntsville, Ala.—This consists of two systems of bars and springs, arranged one on each side of the guard bolt to slide toward and from it, and so contrived that the bars of one side being adjusted against the block lock it, and in that position are unlocked by sliding up the bars of the other side.

IMPROVED LARD PRESS.

Pusey Pemberton, Newark, Del.—Devices are provided whereby the follower may be held level, and may thus be kept from binding, even should there be more scrap or cracklings in one side than in the other, and the mechanical construction is new and well calculated to render the machine efficient.

IMPROVED LEATHER-TAPERING MACHINE.

John Settle, Lebanon, Oregon, and George W. Settle, Oakland, Oregon.—This invention relates to certain improvements upon the patent granted the same inventors, January 19, 1875, for a machine for tapering leather, in which a pivoted frame carrying a knife moves over a hinged adjustable curved block to taper the end of a strap, belt, or other piece of leather, preparatory to attaching the same to another piece, and it consists in the construction and arrangement of a device for clamping and holding the piece of leather in a convenient and effective manner.

IMPROVED TWEER.

Mark Lester, Bellaire, Ohio.—The object of this invention is to prevent the accumulation of sediment in the annular water space of a tweer for blast furnaces, and to prolong the life and utility of the latter. To this end the invention consists in providing the overflow pipe of the tweer with an outlet cock, located near the bottom of the water space, through which the mud and sediment may be washed out, and extending the supply pipe to the nose or hottest part of the tweer, whereby the cold water is first brought in contact with the part of the tweer which most needs the cooling effect, and whereby also the accumulated mud and sediment may be readily washed out by the natural passage of the water.

NEW CHEMICAL AND MISCELLANEOUS INVENTIONS.

IMPROVEMENT IN ORNAMENTS BUTTONS.

Samuel S. Moyer, Berlin, Ontario, Canada.—This process consists, first, in printing the figures upon the face surface of the button by means of type coated with an impermeable composition, then applying the coloring matter, after which the composition is removed by polishing or otherwise.

IMPROVED DIFFUSION APPARATUS.

Charles Neames, New Orleans, La.—The object of this invention is to improve the Julius Roberts diffusion apparatus, in such a way as to secure a more perfect extraction of the saccharine matter from the material used, and at the same time simplify the apparatus. It consists in a diffusion vessel of a diffusion apparatus, gradually increasing in size from its top or inlet, opening to its bottom or outlet opening; in the wood packing interposed between the rim of the doors and the door frames of a diffusion vessel; in a division plate extending from the top to the bottom of the vessel to form the heating chamber, and having its lower part perforated with numerous small holes to serve as a strainer. Finally, heating pipes are placed within the diffusion vessels of the apparatus; and there is likewise a combination of the circulating wheel and its pipe with the diffusion vessel.

IMPROVED CUFF AND COLLAR BOX.

Ernest Scheel, New York city.—This consists of a box divided by a lateral partition into two sections or compartments, of which one is intended for the cuff, and provided with a central tubular post with sliding top. The other is divided by horizontal supports into two parts for inserting a receptacle and storing the collars, neckties, and other articles.

IMPROVED HOMINY KNIFE.

John Outcalt, Spotswood, N. J.—This consists in improved knives of hullers for hominy mills, made with their blades curved with a constantly increasing curvature from their forward to their rear ends. They are also made wider toward their rear ends, inclined upon their upper sides, flat or inclined upon their lower sides, and provided with rasp teeth above, and file or rasp teeth below.

IMPROVED HARNESS SADDLE.

Robert Spencer, Brooklyn, N. Y.—The object here is to afford a broader bearing for tree plates of a given size. The under bearing of wood is made broader than the tree plate, and the flap and jockey are attached to the margins of the face or outer side of the pads. The tree plate is made of sheet metal, with a transverse ridge and corresponding groove or depression.

IMPROVED PACKAGE FOR PAINTS, ETC.

George Sidey, Brooklyn, N. Y.—This invention consists in causing the upper edge of the can body to bear in a groove and against the center of a strip, and providing a flat headed screw working in a nut on the bottom of the can, in order to form a close joint. The article placed in the can is thus hermetically sealed.

IMPROVED PAPER BAG FASTENINGS.

Henry S. Gillette, New Preston, Conn.—A string of suitable length and strength is attached to the bag by means of a piece of paper which is pasted to the bag over the string. This little clip of paper secures the string permanently, so that the clerk need waste no time in seeking for a string to tie the bag.

IMPROVED TOY MARBLE RAKE.

Alfred Gurny, Robert H. Piper, and Henry E. Waite, Bridgeport, Conn.—This is a rake or notched bar employed in marble playing for determining the gains by the numbered notches through which the marbles pass. There is a spring tablet to each notch, with the number of the notch upon it, and contrived to be set in the way of the marble passing through the notch, so as to be tripped by the striking of the marble against it. On being raised, it exposes the number of the notch to view, thus showing the count toward game, the number being concealed while the tablet is set.

IMPROVED AWNING.

Anthony Hessells, New York city.—This consists of a swinging stretching frame and outer curtain, that is wound up by a roller and cord. The roller is supported on a second swinging frame, to be lowered and adjusted to any position for regulating the height. When the awning is lowered entirely, it serves to close the window like a curtain, forming a protection against heavy rain, hail, etc.

IMPROVED CIGAR BOX.

Simon Hood, New York city.—This cigar box admits the convenient arranging of the cigars in bundles, the exhibiting of the same, and the ready taking out for selling them. The body is made of diagonally tapering shape, with steps and guard strips, and is closed by hinged side and front parts and lid.

IMPROVED SHEARS AND SCISSORS.

George H. Taylor, New York city.—This invention consists in constructing shear or scissor blades with a curved shoulder at the rear end of the cutting edge of the blades, to adapt them for use in ripping goods.

IMPROVED HARNESS BUCKLE.

Benjamin F. Frazier, Grand Rapids, Wis.—By suitable construction, when a strain comes upon the strap, the tendency is to draw a frame back, and clamp the said strap between cross bars. The strap is thus held securely without holes being punched in it.

IMPROVED CAMP STOOL.

Charles M. Lungren, Toledo, Ohio.—This invention consists of a double ferrule and hook attachment for the top of the legs, comprising in one casting the hook and the ferrule for connecting the hook to the leg, and also a socket for the attachment of the back support. This forms a stool which may be folded into small compass, and which, nevertheless, when extended, gives a comfortable seat. At the Centennial Exposition, where chairs or seats of any kind are few and far between, portable devices of this type are found very useful.

IMPROVED BEER PUMP.

Philip Krumscheid, Boston, Mass., assignor to himself, J. Krumscheid, and John R. Foley, same place.—This invention consists of a beer pump in which a float shuts off, when raised to a certain height, the water supply, and draws off a certain quantity of water, sufficient to lower the float and re-establish the water supply. The air is forced through and retained in the barrel by a check valve, and drawn into the pump through an air pipe with another check valve, on the falling of the water level.

NEW WOODWORKING AND HOUSE AND CARRIAGE BUILDING INVENTIONS.

IMPROVED GIN SAW FILER.

Frank Charter, Little Rock, Ark.—This is a machine for filing gin saws without removing the saw shaft from its frame, and in such a way as not to leave angular or wavy edges upon the surface of the saw teeth, to cut, chop, or nap the cotton fiber, and thus injure it. The novelties lie in the mechanical construction.

IMPROVED PILE SAW.

David Bean, Le Sueur, Minn.—This consists of a standard for supporting the saw frame, with a clamping device for attaching it to the upper end of the pile to be sawed off underwater. There is also a vertically adjustable arm, on which the frame swings, and on which arm the frame is adjustable to feed the saw up to the pile as the work progresses, and to measure its depth in the water.

IMPROVED BILLIARD TABLE LEVELER.

Samuel May, Toronto, Ontario, Canada.—This consists of a long nut, with an enlarged head at the lower end, screwing on a rod projecting from the bottom of a socket in the end of the leg, in which the nut works so as to conceal the screw rod. Said rod is either a short one, screwing into the leg at the bottom of the socket, or it is formed on the rod used to screw the leg to the table. In both cases it has a collar screwing against the bottom of the socket, and is secured by wood screws screwing into the wood through notches in the edges of the collar.

IMPROVED WHIFFLETREE CONNECTION.

George W. Ingersoll and Harvey L. Fisher, Toledo, Iowa.—This consists in an inclined whiffletree coupling, composed of two unequal bars connected by an eye bar. The inclination of the coupling causes either end of the whiffletree that may swing back to pass above or below the double tree, according as the longer arm is placed above or below the shorter arm, so that there can be no rubbing and wear between said double tree and whiffletree.

NEW HOUSEHOLD INVENTIONS.

IMPROVED MEAL BIN.

John Hunter, Ashland, Pa.—This consists of a kneading trough, kneading board, and a flour sieve, contrived in connection with a flour chest, so as to be more convenient and easier to use than as commonly arranged.

IMPROVED BED SPRING.

John Reardon, New York city, assignor to Orville D. Lovell and Frank H. Lovell, of same place.—This is a bed bottom spring formed of a rabbeted U-frame, a flanged crosshead, a guide pin, and a spiral spring, constructed and arranged so that the bedstead can be put up, taken down, and carried from place to place with as much ease as if the slats rested upon cleats, and the various parts of the spring are so arranged that they cannot cut or injure the mattress.

IMPROVED CARPET STRETCHER.

Lewis W. Rivers, Salt Lake City, Utah Ter., assignor to himself and Hanson J. Rivers, of same place.—In using the device, the carpet is placed between jaws, and a lever is arranged with its sharp lower end resting upon the floor, and its upper part inclining forward over a bar. The upper end of the lever is then forced back or from the carpet, which draws the said carpet to its place. When the carpet has been strained sufficiently a pawl, holds the lever in place until the stay tacks can be driven.

IMPROVED SNOW SHOVEL.

Eugene Campbell, South Westerly, N. Y.—This shovel is provided with a face plate extended beyond the edge of the shovel plate. It also has, on the under side of its front end, and in one piece therewith, the runners arranged to keep the edge of the plate from coming in contact with the surface upon which the shovel is being used.

IMPROVED WEATHER STRIP.

William Watkins, West Joplin, Mo.—This weather strip is formed of a metallic plate, having its edges bent over upon themselves to form grooves to receive a strip of flexible metal, said flexible strip is made wider than the said metallic plate, to give its middle part a U-form.

IMPROVED WASH BOARD.

John S. Washburn, Yonkers, N. Y.—This invention consists in an improved washboard formed of grooved side bars, over which a rubber plate is passed, so that a rubber surface and a wooden surface may alternate with each other to form the rubbing surface of the board.

NEW TEXTILE MACHINERY.

IMPROVED TENSION DEVICE FOR TWISTING MACHINES.

Paul A. Chadbourne, Williamstown, Mass.—This is a contrivance of guide eyes and a roller with the spool stand, from which the threads are supplied to the twister, whereby the tension of all the threads is more uniform than in the common arrangement.

IMPROVED FEEDER FOR CARDING MACHINES.

William C. Bramwell, Terre Haute, Ind., assignor to himself and Edwin Ellis, of same place.—The invention consists of a tilting scale for weighing the wool deposited upon it by a toothed traveling apron, the two (scales and apron) being so connected by a clutch mechanism that the apron is stopped intermittently, thus shutting off further supply until the scale has deposited or discharged the wool which it already contains. The wool having been thus deposited on the feed table, and the scale returned to its original position, and while the elevating apron is delivering a fresh supply to the scale, a loosely pivoted rotating scraper is at work removing the pile of wool just dropped by the scale, and pressing it up to the edge of that which has already been fed on and is about to enter the feed rolls of the carding engine. By this operation the wool is removed out of the way, and a clear place given to the next lot, so that it may not, by piling up, obstruct the proper action of the tilting pan of the scale, and that all the wool may be dropped each time. The tilting and emptying out of the wool from the scale is entirely independent of the time it may take the scale to turn its balance, as this time is constantly varying. It is by this means that the apparatus is caused to run itself out of wool when desired, and yet keep the work even to the last.

NEW AGRICULTURAL INVENTIONS.

IMPROVED PLOW STOCK.

Lemuel H. Davis and Irwin Aycock, Morgan, Ga.—This consists in a plow stock formed of three iron bars, constructed and combined with each other, and with the handles, so as to form a strong and serviceable device.

IMPROVED COMBINED LISTING PLOW AND SEED DRILL.

Alonzo M. Coston, Maryville, Mo.—This is an improved machine for preparing the soil and planting the seed at one passing over the ground, which is left in a deep furrow and ridge alternately. The subsoiler runs in the rear of the main plow, thereby loosening the soil in the bed of the furrow, forming a suitable place to deposit the seed, and dropping the seed and covering it.

IMPROVED CORN PLANTER.

Nathan H. Meeks, Salado, Tex.—This consists of a circularly vibrating dropper slide contrived to be attached to a plow beam or other object to be drawn by a single horse, and be worked by the whiffletree, which has the requisite vibratory motion from the shoulder of the horse.

IMPROVED HOG TROUGH.

Newton A. Clark, Harveyville, Kan.—The object here is to keep the hogs away from the trough when putting in food, to prevent the hogs from putting their feet into the trough when feeding. The mode of operation is as follows: A lever being raised into a perpendicular position, boards are thrown against the back of a frame, so as to allow the hogs to have access to the trough by passing between ribs. On the other hand, when the lever is brought to a horizontal position, or nearly so, the boards are thrown out in front of the trough, so as to exclude the hogs therefrom.

IMPROVED FERTILIZER DISTRIBUTOR.

David C. Brown, Log Town, La.—This is a device for attachment to the rear end of a wagon body for distributing cotton seed as a fertilizer. It may be used for distributing other fertilizers, and which will enable the material to be placed wherever desired. In using the device, a man is placed in the wagon to keep the hopper filled with the fertilizer. The amount of fertilizer distributed may be regulated by increasing or diminishing the number of pins which feed out the material, and by varying the relative size of the driving pulleys.

IMPROVED ANIMAL TRAP.

Homer S. Davis, Camp Brown, Wyoming Ter.—This improves the well known spring trap used for catching animals of large size, such as beavers, foxes, otters, etc., so as to prevent the throwing out of the leg or foot, or the breaking of the same by the action of the spring, in consequence of which the animals frequently escape.

IMPROVED CORN-PLANTING ATTACHMENT FOR SOD PLOWS.

Sanford M. Scott, Stockbridge, Wis.—This is an attachment for breaking-up or sod plows, so constructed as to plant the corn as the sod is turned, and close to the outer edge of the furrow. The corn will thus come up between the sods of two furrows. The device is not in the way of turning the plow over to file or sharpen the share.

IMPROVED POTATO PLOW.

Tubal C. Baxter, Monticello, Kan.—This consists of a forked beam, with a landside and cutter to each branch of the fork, between which is a shovel plow fixed on an easy incline, for the potatoes and the earth to be forced along over the rear end. From said end extend a number of rods, suitably arranged to let the earth sift through, and to carry the potatoes back and discharge them in a row on the top of the earth.

IMPROVED PLOW.

Alva A. Preston, New Troy, Mich.—This is an improved iron beam plow, light, and at the same time strong, which may be easily adjusted to take or leave land, and to run deep or shallow, as may be desired.

IMPROVED MILK PAIL.

Newton McKusick, Stillwater, Minn.—This is a pail with a cover having an opening closed by a strainer, and a detachable funnel with a second strainer, through which the milk passes into the pan. The double strainers prevent any foreign substances, however small, from passing into the milk.

IMPROVED HARROW.

William C. Moore, Cairo, Pa.—This is formed in three sections hinged to each other by bolts and straps. The middle section is made rectangular, and the side sections oblique, having their forward corners beveled off. Shoes are attached to the forward sides of the front cross bars.