

land is a skilled seamstress, a successful authoress, an artist of ability, and a mistress of the spinning wheel and loom. These are but well known instances, out of the scores of examples, of the highest of dignitaries protecting themselves against reverses of fortune by acquiring trades.

THE PROFITABLENESS OF IRRIGATION.

During recent years the British Government has invested something like seventy millions of dollars in irrigation works in India, and it is proposed to spend thirty millions more for such purposes during the next five years. In almost every instance, the works have proved immediately remunerative, while in some cases the profit has been enormous.

On a few of the larger complete works, the expenditure has been as follows:

Ganges Canal.....	\$13,223,225
Eastern Jumna Canal.....	1,038,615
Western Jumna Canal.....	1,671,085
Godavery Delta Works.....	3,221,405
Kistnah Delta Works.....	2,164,470
Cauvery Delta Works.....	211,020
Sind Inundation Canals.....	2,980,000

For all India the net annual revenue from irrigation works now amounts to upwards of five million dollars, or 7.7 per cent of the capital invested. From Oude and the Central Provinces, the returns have been nil. In Rajapootana there has been an annual loss of 19 per cent of the capital. Elsewhere the profits were very encouraging. In the Northwestern Provinces, the revenue shows a profit on the outlay of 46 per cent, in the Punjab 5.6 per cent; in Madras 27.6, in Bombay, including Sind, 16.9, in British Burmah 3.27 per cent. The Ganges canal yields 4.88 per cent, the Eastern Jumna 25.2, the Western Jumna 30, the Godavery delta works 42.16, the Kistnah works, 19.73, the Cauvery works 27.31, the Sind canals 33.3 per cent annually.

Charging against the capital outlay of these works the interest lost on the money invested before the works became productive, compensation paid to landowners, money spent on unfinished and impractical schemes, etc., in addition to the direct outlay, the revenue still shows a considerable balance of profit. The corrected capital, and the percentage of annual revenue thereon, appear in the following table:

Capital invested.	Percentage of revenue on capital.
Northwestern Provinces.....	\$17,827,225 5.2
Punjab.....	15,671,010 4.8
Madras.....	9,467,300 22.72
Bombay (with Sind).....	11,113,940 11.9
Ganges Canal.....	14,400,890 4.5
Eastern Jumna Canal.....	2,349,890 11.2
Western ".....	6,531,965 7.6
Godavery Delta Works.....	3,418,525 39.7
Kistnah ".....	2,337,135 13.2
Cauvery ".....	1,467,890 36.6
Sind Inundation Canal.....	5,930,000 18.6

But the revenue returns from these great undertakings are not the only source of profit. In a country like India, where rains are irregular and transportation difficult—and often in the wet season impossible—a failure of seasonable rain is apt to be followed by loss of harvests and consequent famine, entailing great loss of life, loss of revenue to the government, and sometimes the abandonment of thousands of square miles of fertile soil to the jungle, for lack of cultivators. All this is prevented by irrigation.

In 1860, when a large part of the Northwest Provinces was baked as in an oven, the Ganges canal preserved grain crops enough to feed a million of people who must otherwise have perished unless kept alive at the cost of the Government. And again in 1874 a great multitude were saved from the horrors of starvation; and the enormous outlay consequent upon the famine in the low provinces was kept from being still more enormous by the Soave canal, which even in its unfinished condition enabled luxuriant harvests to come to maturity when otherwise every green thing would have been destroyed by the drouth. In other parts, the seats of some of the worst famines of history have been thoroughly watered and placed beyond the reach of such disasters.

COMPARATIVE COST OF ILLUMINATION.

A number of experiments have been made lately in London to test the comparative cost of illumination with the various materials used for that purpose. Below is the result, the first column containing a description of the materials tested; the second, the price of the material in London, reckoning twenty-four cents to the shilling; the third column shows the duration of the light furnished for one cent, the light being reduced to equal one sperm candle. With the exception of the last named material, common gas, the prices do not vary sufficiently from those which prevail here to effect the value of the comparison. London gas is reputedly of inferior illuminating power, so that the economy of its use can scarcely be so much greater than ours as its cheapness would seem to indicate.

Standard sperm candles, per lb.....	\$ 48	1h. 7m.
Best wax candle per lb.....	48	1: 6
Sperm oil in moderator, per gallon.....	2.28	1: 12
Belmont sperm candle, per lb.....	30	1: 27
Stella, or Burmese wax, per lb.....	30	1: 37
Petrolin candle, per lb.....	36	2: 15
Composite candle, No. 1, per lb.....	22	2: 5
" " " 3 ".....	16	2: 45
Common dip candles, per lb.....	12	2: 52
Almond oil, in moderator, per gallon.....	2.22	3
Colza, per gallon.....	1.20	4: 37
Paraffin oil, in lamp, per gallon.....	72	9: 35
Common gas, per 1,000 feet.....	90	26

The price of gas being about three times as great here as in London, no such marked advantage as appears in the table

can accrue from its use on the score of cost. Still it must rank among the most economical of artificial illuminations, at least three or four times as economical as common candles, for a given amount of light.

A British Steam Tramway.

The Wantage line was only opened for public traffic in October last, and lies in a somewhat remote district. Perhaps it may be well to state, for the information of those who are unacquainted with its formation, that it is about 2½ miles in length, laid down along the side of the turnpike road leading from the town to the station of the Great Western Railway at Wantage Road. It consists of a single line of 4 feet 8½ inches gage, with four turnouts or passing places, with movable facing points at intermediate distances. The rails are of the ordinary bridge section, 40 lbs. per yard, bolted to longitudinal timbers of the dimensions 10 inches by 6 inches, with transoms 5 inches by 4 inches, 10 feet apart. The line crosses the turnpike road once only in the distance, and passes over the Wilts and Berks canal by an iron bridge of 38 feet span; its sharpest curves are of 70 feet radius, and its steepest gradient is 1 in 47, the length of the longest being 330 yards. The machine in use on the line is Mr. Grantham's patent combined steam car. The car has from the commencement continued to run daily with satisfaction, and without in any way obstructing the traffic on the road; and from its freedom from noise, steam, and smoke—the two latter being scarcely observable—horses traveling on the road appear to take no more notice of it than of an ordinary horse car. It may be stated also that on the occasion of the Berks volunteer review, which was held on August 7 last, on ground adjoining the Great Western Railway station, when it was computed that not less than 5,000 persons traveled on the road in vehicles of all descriptions during the day, and the car was running backwards and forwards the whole time, no inconvenience or difficulty with the horses was experienced. The car, which is 27 feet 3 inches in length, 11 feet 1 inch high, and 6 feet 6 inches wide, is divided into first and second passenger compartments, with the boiler and machinery fixed in the center, and runs on four wheels, one pair for driving, the other pair fixed to a radial axle for easing the curves; it is propelled backwards and forwards without turning at either end of the line, and only requires to be replenished with water after a double journey; it is driven from either end by removable levers, the driver having complete control of the machine as regards turning on, shutting off, or reversing steam, as well as applying the brake power, which is so perfect that the car can be brought to an almost immediate standstill. It is constructed to carry, both inside and outside, 60 passengers, and the full complement has often been conveyed by it; it appears highly popular with the public, and the traveling is much preferred to that of the horse cars; and judging from the silence with which it glides along on the rails, the absence of clatter and noise, as well as the ease with which the machine can be worked, it is considered, by those competent to form an opinion of its action, that the time is not far distant when the expensive system of working our street traffic on tramways by means of horse power will be succeeded by the use of steam under proper restrictions, especially as it must be apparent to all acquainted with the subject that the cost of working must be greatly in favor of steam. For the information of those interested, the cost of working the Wantage line, per day of twelve hours, as nearly as can be ascertained, is submitted:

DISTANCE TRAVELED PER DAY, 40 MILES.

Weight of gas coke, 240 lbs.	
Weight of steam coal, 56 lbs.	
—236 lbs. cost.....	67 cents.
Fuel for lighting.....	3 "
Oil and light for car.....	6 "
Driver's wages.....	\$1.20 "
Stoker's wages.....	72 "
Conductor's wages.....	56 "
Estimated wear and tear.....	96 "

COST OF WORKING PER MILE, 11 CENTS FOR STEAM CAR. \$4.20

Cost of horse cars—Four horses, at 72 cents.....	\$2.88 cents.
Two drivers.....	1.44 "
Conductor.....	56 "
Oil and light.....	4 "
Estimated wear and tear.....	1.44 "
Rent of stables, etc.....	24 "

COST OF WORKING PER MILE, 16.5 CENTS FOR HORSE CAR. \$6.60

It will be seen by the above table that the cost of working the Wantage line by horse power is greatly in excess of the cost of working it by steam power; but the time occupied, owing to the restrictions laid down by the Board of Trade, confining the speed to eight miles per hour, is the same.

The Lowe Gas Process.

The long effort to obtain the gases of water upon a practical scale, that is, in unlimited quantity and at an economical cost, is too old and familiar a story to need repetition here. It has covered so many unsuccessful attempts and so many misrepresentations that the very name has been a synonym for failure and fraud. Nevertheless it is to-day an accomplished fact, as real as the systems of steam power and telegraphy; and it is peculiarly gratifying that, after sixty-five years of unsuccessful experiments, in which the most enlightened nations have participated, our Centennial year should witness the complete demonstration by our own countrymen, of a method, the value and influence of which, on the industries of this industrious age, can hardly be estimated. This journal has heretofore directed attention to the earliest performances of the new method, which has

now accepted and accomplished a test upon so large a working scale as to entitle it to a marked recognition. It has recently gone into operation at the Manayunk Station of the Philadelphia Gas Trust, with such excellent results as would seem to justify all that has been claimed for it.

Indeed, each successive trial appears to develop stronger points in the system. For example, in the able report of Professor Henry Wurtz upon its workings in Utica, where it distributed satisfactorily some 24,000,000 cubic feet, its facility was deemed remarkable at a yield of 3,000 cubic feet per single generator for a run of forty minutes. At Philadelphia, however, it has, in the first days of its operation, produced as high as 10,000 feet for thirty minutes, and it is believed that increasing familiarity with the apparatus will show a gain even on this. This advance is, in part, attributable to the delivery of steam at a temperature never before attained, and by a plan at once economical and efficient, the heat being derived from the products of combustion previously burned in a stack of refractory material, through which, when at a white heat, the steam is conducted. This ingenious method also avoids the oxidation so troublesome in all other superheaters.

The high heats evolved by this simple apparatus are likely to reduce to a minimum the carbonic acid gas, already at a low proportion in this process. It would really seem that the question which has been so prominently before the public of late, as to the possibility of obtaining better and more economical methods of lighting, has been fully met and answered by this system.

It certainly furnishes a very brilliant illuminant at what is claimed to be an important reduction in cost, and it is to be hoped that those who control the gas-making interest will give prompt attention to the matter. Their business has grown to be one of the great industries of the period, and it should be conducted upon progressive principles.

But valuable as this process may be for illuminating purposes, it must be manifest that a demonstrated success in this department carries with it some great possibilities in the direction of fuel. There is scarcely a question of greater practical interest than that relating to improved methods of heating, as it affects so wide a range of manufactures in metallurgy, mechanics, and chemistry, to say nothing of the still wider realm of domestic uses. Our present systems are still grossly defective and wasteful, utilizing not more than one eighth of the heating power of coal, without reckoning the inconvenience and cost of handling so heavy a material.

It is hardly unsafe to predict that the coming fuel, for the next stage of swiftly developing civilization, will be in a gaseous form, the advantages of which are too apparent to need enumeration.

When this time comes, and we hope to see it, it is our belief that the gases employed will be the product of water by some such process as the one whereof we write. Air, which is similarly decomposed into gas, is employed to some extent now, principally in the case of the Siemens furnace for steel manufacture, but the excess of nitrogen and carbonic acid render it a very questionable economy. Certainly an element that would furnish hydrogen, in lieu of these two non-combustible gases, would possess great advantages.

The field of investigation presented by the Lowe process at Philadelphia is one of great interest, and should be improved. We shall watch its development and report upon it from time to time.

NEW BOOKS AND PUBLICATIONS.

NOTES ON BUILDING CONSTRUCTION. Part II. (Advanced Course). London, England: Rivingtons, Waterloo Place. For sale by J. B. Lippincott & Co., Philadelphia, Pa.

This is a continuation of a very admirable text book prepared for the use of students in the Government Science and Art Schools, South Kensington, London, and especially directed to the requirements of the examiners of that celebrated institution. If the architects and builders of the coming generation are educated up to the standard contemplated in this work, and are imbued with the thoroughly practical spirit it inculcates, an important improvement in our homes and public buildings, in regard to both the art and the science of architecture, may be looked for. Technical explanations are seldom given with such clearness as in this work; and it is a pity that the author's name is not given, as he has written a standard manual of the very highest excellence. Part I. of the book was published some time since, and reviewed by us at the time. Part III. is now in the press.

THE ELEMENTS OF GRAPHICAL STATICS. By Karl Von Ott, Professor of the Imperial and Royal German High School of Practical Science, etc. Translated by George Sydenham Clarke, Lieutenant Royal Engineers, etc. Price \$2.00. New York city: E. & F. N. Spon, 446 Broome street.

The literature of the graphical method is rapidly extending, and its study now forms a large and important part of the education of properly trained engineers; but although Professor Clerk-Maxwell, and more notably the late Professor Rankine, have used this method in their many well known works, it has scarcely received the attention which it merits. Lieutenant Clarke has faithfully performed the translator's task, and has added some valuable notes to Professor Ott's book, which is an excellent introductory treatise on the whole subject.

ALGEBRA SELF-TAUGHT. By W. P. Higgs, M. A., etc., Author of "Scientific Notes for Unscientific People." Price \$1.00. New York city: E. and F. N. Spon, 446 Broome street.

This is the book that we have been looking for for some time past, namely, a clear and practical introduction to the science of algebra, written in a way to interest the young and uneducated. The many correspondents who modestly inform us that they are "unacquainted with algebra and formulas" should read this little book carefully; and it will open before them a large field of knowledge of the highest practical value in all the mechanical arts.

ELECTRO-TELEGRAPHY. By Frederick S. Beechey, Telegraph Engineer. Price 80 cents. New York city: E. & F. N. Spon, 446 Broome street.

A very readable little text book, containing much information.
TABLES FOR SYSTEMATIC QUALITATIVE CHEMICAL ANALYSIS. By John H. Snively, Ph. Dr., Professor of Analytical Chemistry in the Tennessee College of Pharmacy, etc. Price \$1.00, post paid. Nashville, Tenn.: C. W. Smith, 158 Church street.

This handy volume contains practical directions for the analytical processes used in the investigation of all common substances, which are ar

ranged in tabular form, and are well adapted for the use of students, as an introduction to the voluminous literature on the subject. Much of the matter is new and original; and the author's explanatory notes give many details of manipulation, and point out the precautions to be observed by the operator. The book bears promise of much utility.

LIVER COMPLAINT, NERVOUS DYSPEPSIA, AND HEADACHE: Their Causes, Prevention, and Cure. By M. L. Holbrook, M.D., Editor of the "Herald of Health," etc. New York city: Wood and Holbrook, 13 and 15 Laight street.

The treatises on health and disease which have been published in great numbers of late years do not seem to have diminished the crowds of patients who flock to the doctors in search of remedies for dyspepsia, liver complaint, and other troubles, brought on, as Dr. Holbrook points out, mainly by gluttony, intemperance of all kinds, and laziness. This little book gives the only recommendation possible in such cases, namely, moderation in food and drink, care in the choice of food, exercise, and cleanliness. It is not much to the credit of the invalids and hypochondriacs of our day that these remedies have to be so frequently prescribed.

THE WOOL CARDER'S VADE MECUM, a Handbook of Woolen Industry. By W. C. Bramwell. Terre Haute, Ind.: Hebb and Wigley.

An excellent treatise on a little understood specialty. The tables and formulae for calculating speeds, etc., are especially valuable.

A SONG OF AMERICA, AND MINOR LYRICS. By V. Voldo. New York city: Hanscom & Co.

The "Song of America" commences: "When Earth was but a fledgling, and her race first entertained the everlasting space," etc. The author does not explain where earth's race lived when earth's feathers began to grow, nor the nature of the entertainment to which everlasting space was invited: but he puzzles his readers with a wilderness of riddles of the same kind, and astonishes them with seventy pages of matter that defies the interpreter, and laughs him to scorn. Every line in the book has a sphinx-like impenetrability about it that would be exasperating if it were not perfectly easy to place the volume in the basket thereunto appointed.

Mr. F. GUICHETEAU has recently patented a newspaper file of very convenient form. It consists of a paper box, made in the shape of a book and appropriately lettered on the back. Inside the box, where the backs of the papers are, are cross wires for filing the papers on, and a steel spring for holding them tightly in place. The files are made and sold by Mr. F. Clerget, 1,575 Broadway, Brooklyn, N. Y.

W. E. MARSHALL, artist, has made some fine steel plate portraits of the candidates, which are published by O. Marshall, 697 Broadway, New York.

Recent American and Foreign Patents.

NEW AGRICULTURAL INVENTIONS.

IMPROVED HAND CULTIVATOR.

James S. Lucas, Bowling Green, Ky.—This consists of a hand cultivator with V-shaped arms, having a suitable number of teeth and curved cutting knives at the front part. It is readily used between the rows of vegetables, and forms thus a convenient implement for field and garden use.

IMPROVED MOWING MACHINE.

Frank Pastorius, Quincy, Ill.—This is an improved device for giving motion to the sickle bar of reapers and mowers. To the journals of the gear wheels, which engage with the drive wheels, are rigidly attached two cams, set in opposite directions, so as to alternately push against the opposite sides of, and thus oscillate, a lever, which is connected with the sickle bar.

IMPROVED FEEDER FOR THRASHING MACHINES.

John Potterton Fison, Teversham, England.—This invention relates to a combined drum guard and feeder for thrashing machines. It is designed to prevent accidents by making it impossible for any person to fall upon or be drawn into the drum, and to act, also, as a feed regulator. Should any unusual weight come upon either the cylinder or the upper part of the feed board, the cylinder instantly descends upon the feed board, and the lower at the same time rises to meet the cylinder. The cylinder and feed board being thus brought together, the feed opening of the machine is entirely closed.

IMPROVED HARROW.

James M. Flower, Traverse City, Mich.—The harrow frame is formed of four sections, each section consisting of three bars, arranged in the form of the letter N, connected at one end by a cross bar, and hinged together in pairs.

IMPROVED STRAW CUTTER.

Hugh G. Fladger, Lilesville, N. C.—The balance driving wheel has an eccentric groove in one side, in which a roller works to operate the cutter lever, the roller being mounted at one side of the free end of the lever on a pin.

NEW MECHANICAL AND ENGINEERING INVENTIONS.

IMPROVED CAR COUPLING.

John Slade, Bay City, Mich.—This invention relates particularly to the form of the shank of the hooks, and to the provision of beveled blocks, attached to the side of the hooks, whereby the latter are adapted to be uncoupled when raised to a slight angle.

IMPROVED COAL CHUTE.

Edmund R. Bulkeley, Perth Amboy, N. J.—This consists in the combination, with an adjustable discharging chute section and the feeding bin of an adjustable and intermediate section having a sieve bottom for sifting out the fine coal as it passes from the bin, and for preventing a too violent fall of the coal into the hold of the vessel.

IMPROVED HAY AND COTTON PRESS.

Isaac N. Ward, Henryville, Tenn., and Hugh R. White, Lawrenceburg, Tenn.—This invention is an improvement in cotton presses of the modern type, in which the upper end of the box is left open for filling, and the follower is worked from beneath. The head and sides of the press box are made removable, and the ends travel with the follower, which is operated by pivoted levers. The said levers are connected by movable clamps or dogs, with vertical rods which are pivoted to the ends of the follower, and attached, at their upper ends, to the sliding or traveling ends of the press box; so that as the levers are vibrated, the clamps or dogs bite on said rods, thereby raising the follower and the ends of the press box and the rods simultaneously. The said ends are made in sections to facilitate the removal of the bale.

IMPROVED CAR COUPLING.

Alvin K. Mott, Atlantic, Iowa.—This consists of a drawhead, with sliding and spring-acted block, and a fork-shaped locking piece that slides in side grooves and top perforations of the drawhead, and couples the arrow-shaped head of the link. The forked lock piece is made wider at the lower parts of the legs to admit the forward motion of the spring block and the seating of the lock piece on the forward projecting top flange of the same.

IMPROVED MANDREL OR CORE FOR CASTING.

James M. Rohrer, Shamokin, Pa., assignor to himself and William L. Follower, same place.—The flanges for holding the parts of the mandrel together are bored out tapering to fit the tapering ends of the shell, so as to be easily removed. The shell is cut lon-

gitudinally to receive a beveled key, which is cut beveling, so that it will give toward the center, as the shell contracts when the center plug is given from the shell to relieve the pressure caused by the shrinkage of the casting in cooling. This sectional mandrel is used in casting cylinders of any kind that require hard and smooth inner surfaces.

NEW WOODWORKING AND HOUSE AND CARRIAGE BUILDING INVENTIONS.

IMPROVED WHIFFLETREE COUPLING.

Asa T. Martin, Jr., Waverly, Iowa.—This is an improved coupling for connecting whiffletrees with the double tree, and the double tree with the tongue, so constructed as to prevent them from tipping or turning over. It also causes the end that moves forward to rise, so that it will return to its place. The coupling bolt, which is rigidly attached to a washer, is bent at an angle at its point of intersection with said washer. The washer is made thicker upon one side than at the other, to counterbalance the angle of the bolt and give the whiffletree a firm seat.

IMPROVED SAWMILL DOG.

Alfred Mephram, Fayette, Ohio.—This invention consists of a dog, mounted on a block, which slides up and down on the standard, with a crank pinion and toothed bar for working it, and a ratchet lever for applying great force to press the dog into the log. There is also a secondary plank dog detachably connected to the block carrying the principal log dog, and contrived with a cranked screw nut for drawing the plank up to the standard, in addition to the contrivance for pressing the dogs down into the timber.

IMPROVED SASH BALANCE.

W. Woodward, Nashville, Tenn.—The object of this invention is to provide a simple and efficient sash balance, in which the cords carrying the suspended weight shall be concealed from sight and yet arranged so as to permit the raising or lowering of each sash to its entire length. To this end the invention consists in grooving the sash upon its edges and attaching the cord to the same at the bottom, then passing it between two pulleys, arranged about the middle of the window frame, and thence around a third pulley, located about the center of the window.

IMPROVED COMPOSITION PAINT FOR COATING ROOFS.

Thomas Dana and Zechariah B. Stuart, Manchester, N. H.—This compound may be used as a waterproof coating for any purpose. It is not affected by heat or cold, and is light and durable. It is composed of gutta percha, isinglass, chloroform, and rosin, japan and asphalt varnish.

IMPROVED LOCOMOTIVE WHEEL.

Wilson Weathersbee, Spring Garden, Ill.—This is a new method of gearing one or both of the driving wheels of a locomotive, so that they can turn independently of each other in going around curves, and thus prevent sliding, as when both wheels are keyed fast to the axle.

IMPROVED PUMP.

David N. Green, Rockbridge, Ohio.—The novel feature consists in detachable plugs held over lateral apertures in the pump stock by sliding keys, by which plugs the water in cold weather is allowed to run out.

IMPROVED HORSESHOE BLANK.

James N. Whitman, Pembroke, Me.—This consists of a rolled bar of iron or steel, having formed on one side thereof, in process of rolling, calks for the heel and toe and a nick at the end of each blank. Upon the reverse side is a clip for the toe, and nicks corresponding to those on the calk side.

IMPROVED SIGNAL ATTACHMENT FOR ELEVATORS.

Charles Hoffman, New York city.—This consists of an elevator or dumb waiter, arranged with a number of separate pulls and catches for each story, that come in contact with a signaling or alarm device of the corresponding story when raised to the proper height.

IMPROVED SAW SWAGE.

Asher Willey, Rochester, Mo.—This consists of a recessed stock, provided with shaping dies of different curvatures, that are set into the recesses of the stock, and locked by an inclosing sleeve. The swage is applied to the tooth and driven by a mallet on the same, so that a cutting edge corresponding to the curvature of the shaping die is formed, and thereby a tooth of greater or less cutting power obtained.

IMPROVED SUGAR MILL.

James Mallon, Baton Rouge, La.—This invention consists of a sugar mill, arranged with a perforated steam pipe in front of the receiving rollers, and one or more perforated steam pipes in the cane knife for forcing small jets of steam up through the cane as it passes over the knife or turn plate.

IMPROVED CAR REPLACER.

Homer G. Brooks, Greenville, S. C.—This consists of a casting that rises gradually on an inclined plane from the broader lower part to the narrower higher end, at a level with the rail, being fitted thereto by bottom recesses and rail head binding wings. Guide grooves and flanges lead the car wheel to a key, socketed at suitable angle at the highest end of the replacer, to transfer then the wheel to the rail.

IMPROVED COTTON PRESS.

William H. Horn, San Augustine, Tex.—This relates to the press on which a patent was granted May 5, 1875, to William B. Hollowell; and it consists of a duplicate master wheel on the drum for working the follower: also an improved contrivance for connecting the pitman to the lever and to its pivot, whereby the machine is rendered more efficient, and may be made lighter for a given strength.

NEW HOUSEHOLD INVENTIONS.

IMPROVED APPLE CORER.

Isaac Rogers, Sheridan, Oregon.—This invention consists in combining with a fork, coring tube, and cutter, a cross piece having top pins, whereby the pared and sliced apple is automatically removed. The forward stroke of tube and blade cores and cuts the fruit, while the return stroke carries the core back and drops the divided fruit.

IMPROVED CARPET SWEEPER.

Samuel F. Leach, Chelsea, Mass.—This invention consists in carpet sweeper gear wheels made of leather, treated with a hardening and waterproofing substance or substances. Leather is better than wood or metal because it is entirely noiseless and will not tear the carpet, and it is also superior to rubber or rubber compound, as it will always preserve its round or true shape, which is not the case with rubber wheels.

IMPROVED SUSPENSION BED SPRING.

James W. Wright, Washington, D. C.—This invention relates to an improved construction of suspension bed spring; and it consists in detachable wire springs bent so as to form seats in which the ends of the slats are suspended, the said pieces of wire having their

middle parts bent into coils, through which passes a rod, and their ends extended upwardly in the form of arms terminating in hooks. The seats for the slats project laterally from the said rod, which latter, passing through the coils, operates as a pivot for the same, while the upwardly extending hooks are detachably fastened to the end frames of the bedstead and sustained in a suspended position.

IMPROVED AUTOMATIC FAN.

Morris Ruben and Herman K. Bradshaw, Alexandria, Va.—The object of this invention is to provide a cheap and available motive power for driving fans, with a force sufficient to produce a current of air over a dining room table, bed, or sick couch, thereby accomplishing the double result of supplying a cool current of air, and driving away flies, mosquitos, and other troublesome insects. To this end the invention consists in an overshot wheel, arranged to be operated by a stream of falling sand or water, and combined with peculiar mechanism for operating the fan.

IMPROVED FRUIT JAR RACK.

Stokley D. Dilts, Lawrenceville, Ill.—This rack consists of bars and frames, the latter being provided with opening to allow the top to be secured at a greater or less elevation above the bottom to suit jars of different heights.

IMPROVED FURNITURE CASTER.

Benjamin E. Flanders, Brooklyn, N. Y.—This consists of a caster, the socket of which is provided with an interior concavo-convex glass shell, which extends from the upper point of greatest pressure, and bears on a revolving ball that is retained by an outer metallic casing. The friction between shell and ball being reduced to a minimum, the wear is decreased.

IMPROVED CARPET FASTENER.

John H. Campbell, New York city.—This consists in a carpet fastener made of sheet metal, and having key holes, which allow it to be placed over and slid under the heads of rivets. When the fastening nails are placed in position, and the carpet cut, sewn, and stretched, the edge of the same is carried by the flat knife under the clamping top part, and the knife then withdrawn. The toothed part of the fastener takes firmly hold of the edge of the carpet, and prevents its escape, whatever be the strain thereon.

IMPROVED REFRIGERATOR.

Mahlon Moon, Morrisville, Pa.—Between a preserving chamber and the ice chamber, a fibrous or absorbent material is placed to collect and carry off the moisture condensed from the air. This furnishes a simple device for preventing injury to fruit, etc., by dampness.

NEW MISCELLANEOUS INVENTIONS.

IMPROVED FOUNTAIN PENHOLDER.

Almerrin P. Allen, Denmark, Iowa.—This is an improved fountain penholder that supplies the required quantity of ink to the pen during writing, while holding at the same time the main body of ink in check, and conveying it in regular and even manner to the point of the pen. The novel features are a cap extension and beveled point, connected by narrow side strips, that fit the shape of the pen.

IMPROVED FUNNEL.

John O. Barton, Chicago, Ill.—This is a convenient device for grocers and others dealing in sirups. The invention consists of a funnel, with an interior plug, to close the discharge spout, and cross wires to indicate the quantity to be measured. The funnel has a hermetically fitting screw cap with a central air tube, to which the pipe, connecting with a force pump applied to the barrel, is attached, so as to force the sirup quickly into the jug.

IMPROVED COMBINED ELECTRIC FIRE SIGNAL APPARATUS AND FIRE EXTINGUISHER.

Thomas F. Nevins and John W. Smith, Brooklyn, N. Y.—With the pipe through which the water is brought into the building and in the upper part of the room is connected a perforated pipe through which the water is discharged into the room, and in which, near the pipe, is placed a stopcock. To the handle of the stopcock is attached a weight. The stem of the weight is made with an eye to receive a pin, that is held back by a spring and is held forward by a cord which is led to different parts of the room, so that, should a fire occur, the flame may burn off the cord and cause the weight to drop, which opens the cock and causes a discharge of water into the room. In the pipe is placed a small water wheel, which, when the cock is thus opened, rotates thereby, sounding an alarm.

IMPROVED TOY CAMERA.

August Herzog, New York city.—This is a photographic apparatus, of simple construction, consisting of an upright frame, to which a camera, with sliding lens tube, is applied. Supports are also provided for a ground glass and plate holder.

IMPROVED ELECTRICAL APPARATUS.

Jerome Kidder, New York city.—This apparatus is designed for medical use, and includes several novel devices. A portion of a series of battery elements, arranged for transmitting a circuit through the body, are adapted to operate an induction coil. A new means is provided for substituting fresh fluid for that which has become spent in power, in the elements. There are new supports for the induction coil, and some novel arrangements for modifying the force of the induced currents.

IMPROVED PROCESS FOR THE MANUFACTURE OF RAWHIDE.

William Coupe, South Attleborough, Mass.—This improved process consists in submitting the hides or skins from which the hair has been removed to a succession of baths composed of a solution of lime, etc., and, when partially dry, coating them with a mixture of tallow, beeswax, and paraffin, and then submitting them to the action of a revolving drum or other suitable softening apparatus.

IMPROVED TOY PISTOL.

Otto C. Butterweck, St. Louis, Mo.—This invention consists of a pistol in which any projectile is impelled from the barrel by a concave-faced piston, around the rod of which is coiled spiral spring. The piston rod is drawn back by means of a button or loop on its rear end, and is retained in position by a projection, on a spring trigger, which catches against the front surface of the piston; the spiral spring being compressed between the latter and the inner surface of the rear end of the pistol.

IMPROVED BUCKLE.

Charles W. Higinbottom and Frederick F. Smith, Vandalia, Ill.—This invention is an improvement in that class of buckles in which the tongue is made detachable and entirely separate from the frame. The tongue of this improved buckle is provided with a rib or lug in the center, and with claws or points on its ends, which pass through holes in the strap or straps, to which the buckle is applied. When the tongue is adjusted in place, the rib or lug prevents displacement of the end of the strap, and aids the claws in sustaining the strain to which the strap is subjected.

IMPROVED BARBED FENCE WIRE.

Rollin G. Brown, De Witt, Iowa.—This consists in an improved fence wire, formed by interlocking with each other sections, having loops and barbs formed upon their ends.