THE

Scientific American.

MUNN & COMPANY, Editors & Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

☞ "The American News Company," agents, 121 Nassau street, New York.
☞ Messrs. Sampson Low, Son & Co., Booksellers, 47 Ludgate Hill London, England, are the Agents to receive European subscriptions or advertisements for the SCIENTIFIC AMERICAN. Orders sent to them will be promptly attended to.

VOL. XI. NO. 2....[NEW SERIES.]....*Twentieth Year.*

NEW YORK, SATURDAY, JULY 9, 1864.

Contents:

(Illustrations are indicated by an Asterisk.)

PAPER FROM CORN HUSKS.

For many years the Austrian Government have encouraged a series of experiments made to test the value of Indian-corn husks for making paper, and from the manufactured samples we have seen it appears that so far as the practicability is concerned the scheme has been successful.

It is apparent that some substitute for rags is very much required, for the supplies are yearly becoming scarcer; more particularly since the war, when the cotton market has been so scantily filled. Certain kinds of the softer woods are now used to a great extent in the manufacture of paper, and the peculiar machines and processes necessary to work this substance have been brought to great perfection; and wood-paper may, in time, supply a portion of the demand for the ordinary purposes of business at a cheap rate.

Paper, it is well known, can be made from a variety of substances; but the cost of manipulation is in many cases too great to make them available. It is one objection urged against the use of corn husks for paper that the stock commands at this time a very high price, seven or eight cents per pound, simply for use in mattresses, and that if brought forward as a substitute for rags, the demand would run the price up immediately. Be this as it may the Austrian Government now makes paper of a superior quality from corn husks alone and puts it into the market against rag-paper. The Government has an advantage which paper-makers in this country have not, and that is in being able to purchase rags at first hands, so to speak; the great ports from which they are sent to this country are chiefly in Austria or the immediate vicinity. There are, moreover, other points in the manufacture of paper from corn husks which render an investigation into its value important. The process of reducing the pulp or fiber from which the paper is made, leaves the stouter fibers or skeleton of the husk uninjured, and these are easily woven into strong stout cloth, or a fabric resembling crash toweling. Still another resultant, besides the paper stock and fiber is obtained. This is the starch contained in the husk, which is all saved, pressed into square cakes. and afterward ground into flour from which bread has been made. If not desirable for this use here, it is certainly valuable for feeding animals. It is therefore clear that the corn husk is capable of a variety of uses, and it is important that it should receive serious attention. It is not reasonable to suppose that the Austrian Government are spending time and money in the pursuit of a chimera, and if it can be made an article of commerce in that country, there is no reason why we too should not reflect upon this subject.

If we sleep upon mattresses made of husks, it is plain that by intelligent management we could turn the material to much better advantage and use the fibers for bags; we may extract the life-supporting principle, and set free the paper stock to go abroad to our countrymen in the shape of weekly journals, and yet have mattresses from some other and cheaper material.

These are not schemes which we have briefly alluded to, but only an incomplete record of the uses to which the maize plant is now put in Austria. Rolls upon rolls of the cloth are manufactured annually, and it is both stout and strong; a sample can be seen at this office. The great question to be looked at is simply—Will it pay? The obvious inference is that if the Austrian Government finds it advantageous to foster establishments for using corn husks in this manner, manufacturers in this country may at least examine into it with profit. If it shall be found (and we are sanguine it will) that corn husks can be put to better uses than feeding cattle or stuffing mattresses, a very great field is open for the development of a new source of individual and national wealth.

THE HECKER AND WATERMAN EXPERIMENTS.

For the benefit of our new subscribers we will briefly state that this is an elaborate series of experiments being conducted at 239 Cherry street, in this city, by Henry Waterman, at the expense of George V. Hecker, to ascertain the actual advantage of working steam expansively, in a cylinder both with and without a jacket of steam. The cylinder is made of steel plate 1-10th of an inch in thickness, and is surrounded by a similar plate, the space between being 3-8ths of an inch thick. The whole is then secured in an ordinary cast-iron cylinder. The experimental engine has a cylinder 10 inches in diameter with 2 feet stroke. Experiments are tried with the space between the two cylinders filled with steam, and then under the same conditions without steam in this space. The engine is also worked as a condenser and as a non-condenser. For each experiment the engine is run constantly 30 hours, observations being recorded every hour. To give a full idea of the character of these observations we publish the headings of one of the 30-hour sheets, with a few of the hourly records, and the observations and computations which are made on each sheet:—

MARCH 18, 1864. STEAM IN HEATERS.

Hour.	Counter. Number.	Counter. Rev'n per min.	Steam in Boiler.	Thermometer. Room.	Thermometer. Feed tank.	Thermometer. Hot well.	Feed tank steam chest.	Water from steam chest.	Water from heaters.	Vacuum.	Coal.	Barometer.
5 P. M.	966200	60·63	38	68	80	97	h.m. 41	lbs. 12½	27¼		lbs. 360	29·65
6 "	966838	60·96	37	69	88	90		13½	27¼			29·65
7 "	160	61·20	36	69	87	90	8-15	13	27¼			29·65
8 "	4132	61·96	36	70	89	88	lbs.	14	27¼			29·65
9 "	7782	60·83	36	69	89	90	5	13¼	27¼			29·65
10 "	11500	61·96	36	69	87	91	5	13¼	27¼			29·65
11 "	15214	61·90	36	70	89	90	9-45	13	27¼			29·65
12 "	18916	61·70	37	70	89	90	11-15	12½	27¼			29·65

The observations are recorded in the same way for the 30 hours, when the ashes are weighed and deducted from the weight of the coal used. The figures in the columns are then added, the means calculated, and the pounds of water evaporated per pound of coal and per pound of combustible are computed and recorded.

IN the month of May three locomotive boiler explosions occurred on English railways. It is reported that in every instance the dome has been the seat of failure.

METAL-WORKING.

The perfection to which metal-working has attained is one of the miracles of modern times. Tools cut iron and brass at speeds which, fifteen years ago, would have been pronounced unattainable with economy. In gun and pistol factories and in sewing machine shops the various pieces are turned, milled, sawed, planed, or ground in such quantities and with such unfailing accuracy as to command the admiration of the observer Not only have the tools been greatly improved in their character, but the material worked upon has also undergone important modifications ; by this we mean the processes to which it is subjected before it is worked by cutters. Steel is annealed so thoroughly that its character as a tough, tenacious, and stubborn metal is wholly destroyed, and it becomes as tractable, so to speak, as the softest iron. Its virtue is not destroyed by this operation, but changed, and the temper is restored again at will.

It is important to remember that these improvements in working metals were not reached by conjecture, or by a single bound; but by successive steps and careful experiment. Whatever advantages we enjoy over other nations as skillful workmen is due wholly to the skill and intelligence of our artisans, and it is no hyperbole to say that they are indeed the bulwarks of the nation.

THE GOVERNMENT STEAM EXPERIMENTS.

The Commission is moving steadily forward in the prosecution of these experiments. On starting the engine it was found that the arms of the fans which furnish the resistance were not quite strong enough, and they are being made stronger. Mr. Allen, the head of the Commission, is satisfied that the fans are going to prove a very perfect resistance for the purpose of experiment; being adjustable to any amount of resistance desired, offering a resistance which is perfectly uniform, and which can be measured with accuracy in foot-pounds. It is the intention to try the effect of cutting off steam at different points in the same cylinder, the effect of different areas of ports, of different leads, and of all other matters connected with the working of the steam engine which it is desirable to know, and which can be ascertained by means of the extraordinary facilities placed by the Government in the hands of this Commission.

CHARLES WYE WILLIAMS ON HEAT AND STEAM.

There are two classes of writers—clear-headed men and muddy-heads. The first embraces all of the great minds, and numerous others who, with fewer ideas, yet understand distinctly everything that they think they understand. When this class of men attempt to convey their ideas they generally use short, simple words ; and they always use words whether short or long, with a perfect understanding of their exact signification. One of the charms of Macaulay's matchless style is the manifest fullness of his appreciation of the precise meaning of every word and phrase which he employs. The same is observable in the writings of Sir John Herschel, of Dr. Lardner, of Faraday, of all the great masters of science.

The muddy-heads are not all by any means destitute of intellect. Some of them have a great many ideas, but their ideas are always vague, undefined, and without distinctness. When men of this class attempt to speak or write, the meanings which they attach to their words and phrases are generally as vague as their ideas. The most perfect specimen of this class is Charles Wye Williams. He has written a book of 278 pages on Heat, Water, and Steam, which has been republished by the great industrial publisher, Henry Carey Baird, of Philadelphia.

The vague way in which Williams uses language is forcibly shown in a paragraph on page 32 of his book. There are three phrases which he has occasion to use very frequently in his discussions—these are *latent heat*, *atoms of water*, *and units of heat.* Now each of these has a definite meaning which has been perfectly established by general use.

Latent heat is the heat which disappears when a body changes from the solid to the liquid state, or from the liquid to the gaseous state. To talk about the latent heat in ice, or in any solid, is nonsense.

An *atom of water* or of ice is formed by the com-

bination of one atom of hydrogen with one atom of oxygen; the atom of oxygen weighing eight times more than the atom of hydrogen. But how many of these atoms it takes to make a pound nobody knows. They are too small to be seen or to be weighed singly.

A *unit of heat* is the quantity of heat required to raise the temperature of 1 pound of water 1 degree.

Mr. Williams contrives to put all three of these phrases into a single sentence, and to employ each in a sense different from that which general use has assigned to it—a sense peculiar to Mr. Williams, which he does not explain, and which we suspect must be very vague in his own mind.

"The quantities of heat inherent in water in each of its three states are, in the general opinion of chemists, as follows, viz.: the *latent heat* of ice, 40°, that of liquid, 140°, and that of vapor, 1,000°. The first two are supposed to be ascertained by certain physical tests; the last, however, can only be received as an approximation to what *cannot be determined with certainty.*

"If, then, the maximum heat contained in ice be 40° latent and 82° sensible, the inference would be that each atom of the crystallized mass, on receiving an additional unit of heat, would have its statical conditions altered; that, losing its crystallized form, it would separate from the mass, and become part of a fluid or liquid body."

Using words in their ordinary signification, there is no latent heat in ice, and if an atom of ice should receive an additional unit of heat it would become part, not of a liquid body but of a gas, it would be steam superheated; or, more probably, it would be decomposed into the two atoms, one of oxygen and the other of hydrogen, of which it was formed.

NEW YORK MARKETS.

[WEEK ENDING JUNE 30, 1864.]

Ashes—Pot, $12; pearl, $14 per 100 lbs.

Beeswax—68c. to 70c. per lb.

Bread—Pilot, navy, crackers, 4¾c. to 8c. per lb.

Candles—Adamantine, stearine and sperm, 29c. to 55c. per lb.

Cement—Rosendale, $1 50 per barrel.

Coffee—Java, 49c. to 50c. per lb.; Rio, 43c.; St. Domingo, 38c. to 40c.

Copper—American ingot, 46½c. to 50c. per lb.; bolts, 60c.; Sheathing, 62c.

Cordage—Manilla, 23c. per lb.; Russia—tarred, 22c.; American, 17c.

Cotton.—Ordinary, $1 12 per lb.; Middling, $1 46; Fair, $1 56.

Domestic Goods.—Sheetings, brown standard, 62c. per yard; Shirtings, brown, 7-8, standard, 45c.; Prints, Merrimack 33c.; Prints, other 27c. to 32c.; Flannels, 50c. to 90c.

Dyewoods, Duty Free.—Fustic, $52 50 to $55 per tun; Logwood, $30 to $62 50; Lima Wood, $175.

Feathers—78c. to 80c. per lb.

Furs.—Otter, $4 to $10 skins; Lynx, $3 to $5; Muskrat, 25c. to 40c.

Flax—16c. to 22c. per lb.

Flour and Meal—$8 50 to $11 20 per barrel; Rye Meal, $7 25 to $8 25.; Corn Meal, $7 50 to $8.

Grain.—Wheat, $2 10 to $2 40 per bushel; Rye, $1 80; Barley, $1 35 to $1 50; Oats, 91c. to 98c.; Corn, $1 52 to $1 60; Peas, $1 45 to $1 60 Beans, $2 67 to $2 90.

Hay—$1 35 per 100 lbs.

Hemp.—American (dressed), $275 to $315 per tun; Russian, $400; Jute, $310 to $320.

Hides.—City Slaughter, 13½c. to 14c.; other varieties range from 15c. to 36c.

Honey.—$1 30 to $1 60 per gallon.

Hops.—18c. to 30c. per lb.

India Rubber.—40c. to 98c. per lb.

Indigo.—Bengal, $2 to $2 60 per lb.; others, $1 20 to $2 30.

Iron.—Scotch pig, $70 to $72 50 per tun; American, $62 50 to $68; Bar—Swedes —; English, $190 to $200; Sheet—Russia, —; English, 9c. to 11½c.

Lead.—American, $14 50 to $14 75 per 100 lbs.; English. — Pipe, 19½c.

Leather.—Oak-tanned, 49c. to 59c. per lb.; Hemlock, 27c. to 51c.

Lime.—$1 35 to $1 80 per barrel.

Lumber.—Spruce, $21 to $23 per 1,000 feet; White Oak, $35 to $40; White Oak Staves, $120 to $200; Mahogany crotches, 80c. to $1 50 per foot; Rosewood, 4c. to 12c. per lb.

Molasses.—75c. to $1 15 per gallon.

Nails.—Cut, $7 50 per 100 lbs.; Wrought, 35c. to 41c. per lb.

Oils.—Linseed, $1 58 to $1 60 per gallon; Sperm, $2 01 to $2 25; Petroleum, crude, 47c.; refined, 76½c. to 90c.; Naphtha, 36½c. to 90c.

Provisions.—Beef, mess, $15 to $16 per barrel; Pork, mess, $40 to $43 25; Butter, 28c. to 42c. per lb.; Cheese, 13c. to 20c.

Rice.—$8 75 to $12 per 100 lbs.

Salt.—Turk's Island, 60c. per bushel; Liverpool fine, $4 50 per sack.

Saltpeter.—20c. to 25c. per lb.

Spelter.—15¼c. to 15¾c. per lb.

Steel.—English, 16c. to 42c. per lb.; German, 15c. to 23c.; American cast, 25c. to 30c.; American spring, 16c. to 19c.

Sugar.—Brown, 18c. to 23c. per lb.

Tea.—65c. to $1 65 per lb.

Tallow.—American, 16½c. to 16¾c. per lb.

Tin.—Banca, 70c. per lb.; English, 60c.; plates, $19 to $25 per box.

Tobacco.—Leaf, 12½c. to 30c. per lb.; Cuba fillers, 60c. to 85c.; United States wrappers, 25c. to 65c.; Manufactured, 55c. to 70c.

Wool.—American Saxony fleece, 95c. to $1 00 per lb.; Merino, 90c. to 95c.; California, 20c. to 48c.; Foreign, 25c. to 60c.

Zinc.—25c. per lb.

ISSUED FROM THE UNITED STATES PATENT-OFFICE FOR THE WEEK ENDING JUNE 28, 1864.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

43,276.—Wheel Vehicle.—Rodney W. & Samuel Ackley, Lima, Mich.:

We claim the screws, s, the nuts, o, the rods, t, and the rest, d, the whole constructed, arranged, and operated in the manner and for the purpose substantially as herein set forth.

43,277.—Washing Machine.—Joseph Adams, Janesville, Ill.:

I claim the employment or use of a double-inclined board, B, in connection with the two rollers, F F, arranged with the yielding bars, E E, lever frame, D, uprights, d d, and bar, C, or their equivalents, to operate in the manner substantially as and for the purpose set forth.

In combination with the above I also claim the slats, c, at the ends of the suds-box, A, as and for the purpose specified.

[This invention consists in the employment of pressure rollers connected with a lever frame in a novel manner, and used in connection with a double inclined clothes-board fitted in a proper suds-box, having cleats secured to the inner surfaces of its ends; the lever frame being arranged in connection with upright guides, and all so arranged that the clothes are acted upon in the most favorable manner for their perfect cleansing from dirt, both the rubbing and squeezing operations being gone through with in the washing process.]

43,278.—Kiln for annealing Glass.—Thos. B. Atterbury, Pittsburgh, Pa.:

I claim, first, A leer or kiln for annealing glassware constructed with a depressed arch, having inlets and outlets for the glass combined with the endless closed carriage and circular railway, substantially as described.

Second, Depressing the circular arch at or near the chimney, E, substantially in the manner and for the purposes described.

Third, A leer for annealing glassware which is so constructed that the ware is subjected to an intense but nearly uniform heating process in passing through one portion of the annealing chamber of the leer, and is then subjected to a gradually cooling process in leaving the point where the chimney-flue is located, substantially as described.

43,279.—Washing Roller.—James E. Atwood, Trenton, N. J.:

I claim the arrangement and combination of the handle, A, and rollers, D D', with the end pieces, B B', also the arrangement of the shield, C, all substantially as described for the purposes set forth.

43,280.—Self-acting Felt-guide for Paper-making Machines.—Theodore Baker, Stillwater, N. Y.:

I claim the cam, A, and journal box, B, when used in connection with the guide roll, C, as a self-acting guide for felt cloths, and wire cloths, of paper-making and other machinery, in its passage over the rolls, in the manner described and for the purpose specified.

43,281.—Tool for riving Splints.—Wm. Baker, East Templeton, Mass.:

I claim, first, The wedge-shaped knife, B, with an oblique or square cutting edge, and made adjustable in the stock, A, substantially in the manner and for the purpose specified.

Second, The adjustable face or sole, C, in combination with the stock, A, and knife, B, constructed and operating in the manner and for the purpose substantially as herein specified.

[This invention relates to an improvement in that class of tools which are used for the purpose of making splints for baskets, chair-bottoms, and other articles.]

43,282.—Rake for Harvesters.—John Baldwin, St. Paris, Ohio:

I claim, first, The crank-wheel, G, connected with the toothed wheel, E, by means of the clutch, b, the swinging arm, N, pitman, O', and shaft, P, to which the rake is attached, all being arranged as shown, to communicate a reciprocating motion to the rake, as set forth.

Second, The bent lever, R, in connection with the segment ledge, V, spring, l, and shaft, P, with the rake pivoted to the latter, and all arranged to operate in the manner substantially as and for the purpose specified.

Third, The placing of the rake-head, U, in a tube, T, having a longitudinal slot, p, in its under side, substantially as and for the purpose set forth.

[This invention relates to a new and improved raking device, such as are commonly termed "automatic," for harvesters, and it consists in a novel means employed for operating the rake, as well as in a novel construction of the rake itself, whereby the cut grain may be raked from the platform in a perfect manner, the gavels being laid or deposited evenly on the ground, to facilitate the binding operations. The invention also consists in the employment or use of a roller placed over the rake, and arranged in such a manner as to prevent the rake, when on the platform, from interfering with the cut grain being properly laid or deposited thereon.]

43,283.—Fire Escape.—A. T. Ballentine, New York City:

I claim, first, The combination of a sliding ladder with an outside shutter, which is made to contain it when folded, and a main shutter, substantially as shown.

Second, Locking the sliding ladder, when folded in its case, by means of the stump, D, constructed and operating substantially as shown.

Third, The sill, C, and its sliding platform, constructed substantially as shown.

Fourth, The system of toggle joints, s and u u, to move the sliding platform out, substantially as described.

Fifth, The false hinge, O, and its shank, q, operated by means of the outside shutter, substantially as described.

[This invention consists of a ladder combined with one leaf of a window shutter so as to be concealed within it, being slid up within it by means of a wrench, and allowed to slide down to the ground whenever a catch is released. The catch or locking apparatus is connected to a false window-sill in such a way as to draw it out and make it project from the sill as soon as the ladder is released from the shutter, and thus furnish a platform from which to reach the ladder.]

43,284.—Breech-loading Fire-arm.—Fordyce Beals, New Haven, Conn.:

I claim, first, The combination and arrangement described of the lever, L, and spring lever, P, for the purpose specified.

Second, The combination and arrangement described of the lever, L, hook, O, and hammer, for the purpose specified.

43,285.—Sewing Machine.—Franklin H. Brown, Chicago, Ill. Ante-dated June 18, 1864:

I claim, first, The combination and arrangement of the feed bar, F, the eccentric, m, the fulcrum, v, and the lever, G, slide, I, and dove-tailed race, H, arranged and operating substantially as shown and described.

Second, I claim the combination and arrangement of the shuttle-carrier, A, sliding upon the pin, x, the wheel, C, and face plate, E, operating as and for the purpose specified.

43,286.—Clamp for Clothes-wringers.—J. D. Burdick, Ashway, R. I.:

I claim the combination of the wringer frame, A, screw-clamp, a B C, and hinge, D, when the said hinge extends from top to bottom of the clamp frame, and the various parts are constructed, arranged, and employed in the manner herein shown and described.

[This invention relates to an improvement in fastenings for securing clothes-wringers to wash-tubs or wash-trays. The invention is more especially designed as an improvement on the fastening of the "Eureka Clothes-wringer," so called, and which was patented by D. W. Swift, Jan. 28th, 1862,]

43,287.—Bottom of Wash-boilers.—Charles Burnham, Springfield, Mass.:

I claim, as an article of manufacture, a bottom for boilers, made of sheet metal and corrugated but with a plain margin or lip surrounding the corrugations, as herein-before set forth.

43,288.—Corn Plow.—L. H Castor, Eddington, Ill.:

I claim, first, Moving the standards, i i, of the plows, I, laterally by means of the bail-shaped bar, J, bent levers, K K, and treadles, L L, all arranged substantially as herein set forth.

Second, The combination of the bars, C C, frame, D, driver's seat, E, rock shaft, F, links, d d, and levers, G c, all constructed, arranged, and employed, substantially as described, for raising the plows when required.

[This invention relates to a new and improved means for adjusting or moving the plows laterally, so that the same may be made to conform to the sinuosities of the rows of corn to prevent the plants being plowed out of the ground while the implement is being drawn along; and the invention also relates to an improved means for raising the plows out of the ground when desired, and also to an improved draught attachment by which the draught is equalized.]

43,289.—Braiding Attachment for Sewing Machines.—Horace H. Chittenden, New Haven, Conn.:

I claim, first, The spindle, a, with one or more fingers, b c, and guide, f, when the same are made to operate in combination with the needle of sewing machines and its operative mechanism, substantially as and for the purpose specified.

Second, The combination and arrangement described of the spindle, a, segmental guide, f, and yoke, i, or its equivalent, substantially in the manner and for the purpose herein set forth.

Third, The lever, 7, pins, 10 and 11, and dogs, 14 and 15, when the screws are combined and arranged to operate together, substantially in the manner specified.

Fourth, The lever, 7, and slide, 4, in combination with the fingers, b c, substantially in the manner and for the purpose described.

43,290.—Washing Machine.—C. A. Clark, Pulaski, Iowa:

I claim the combination of the box, A, lever, C, rod, D, plunger, E, perforated bottom, G, spigot, I, vertical strips, L, and hook, J, constructed, arranged, and operating in the manner and for the purpose specified.

43,291.—Elevating and transporting Device.—E. B. Coffin, Olneysville, R, I.:

I claim the curved bar or beam, E, mounted on wheels and provided with a windlass composed of the shafts, O H, connected by the gearing, M N, and operated through the medium of the gearing, I J, crank, K, and pawl, L, in connection with the brake or strap, W, attached to the foot lever, Y, and the pawl, R, and lever, S, or their equivalents, all arranged to operate substantially as and for the purpose specified.

[This invention relates to a new and improved implement or device for elevating and transporting articles from place to place, and is more especially designed for building stone walls, in which large stones are employed; the stones being elevated by the device from the ground and carried in a suspended state to the wall in course of construction and deposited thereon.]

43,292.—Mode of preventing the Potato Rot.—Christopher Corey, Lima, Ind.:

I claim the invention of counteracting and remedying, in the tubers themselves, the potato rot, as a specific disease, caused primarily by insects and animalcules, and secondly by the infectious fluid and gases of the potatoes thus affected, by the direct destruction of the former, and by the timely regulation or removal of the latter, substantially as herein set forth.

43,293.—Horse-shoe.—George Custer, Monroe, Mich.:

I claim a horse shoe constructed in the specific manner herein represented and described.

43,294.—Stop-motion for Knitting Machines.—Joseph Dalton, Brooklyn, N. Y.:

I claim furnishing the bobbin of a knitting machine with a movable piece, b, applied to operate substantially as herein described, for the purpose of unlocking the stop motion when the yarn gives out.

43,295.—Boot and Shoe.—George W. Day, Charlestown, Mass.:

I claim, as a new article of manufacture, a boot or shoe, having a construction substantially as specified.

43,296.—Safe.—Thomas Dolan, Albany, N. Y.:

I claim the casting of the shell of a fire-proof safe door with an off set or chamber, A, to receive the lock, C, substantially as and for the purpose herein set forth.

43,297.—Window-sash Fastening.—John P, Ellis, Flushing, N, Y.:

I claim the combination of the hinged plate, F, and slide, G, with the spring catch, B, substantially in the manner herein shown and described.

I also claim the combination of the plates, F, and slides, G, one or more of each, with the frame, E, all constructed and operating substantially in the manner herein shown and described.

I further claim the employment of a yielding holding surface, F, or its equivalent, with the holding catch, B, substantially in the manner herein shown and described.

[This is an improved spring sash-fastener by which the window may be set and locked in any desired position, without the need of employing the hand to press or operate a spring bolt. Both hands are thus at liberty to move the window, which may be said to lock itself. The superior convenience of the improvement must be obvious.]

43,298.—Gun Carriage.—John Ericsson, New York City:

I claim, first, Providing for the working of a gun carriage by securing two of its trucks firmly to a revolving axle, and combining the said axle with a system of toothed gearing attached to the carriage, substantially as herein specified.

Second, The employment for producing the friction necessary to check the recoil of a gun carriage, or hold it securely in any position, of a system of metal plates and a system of interposed timbers, the one attached to the carriage and the other to the bed or platform upon which it works, substantially as herein-described.

Third, The compresser composed of two levers, M M', and a screw shaft, P, with collars, Q k, and a nut, N, applied and operating in combination with the check plates, K K, and friction timbers, L L, substantially as herein specified.

[The object of this invention is to enable a heavy gun to be worked by few hands, and to reduce the recoil in such degree as to permit the gun to be worked in a turret or within a limited space.]

43,299.—Apparatus for exhibiting Photographs.—Wm. Henry Fay, Chester, Mass.:

I claim, first, The cover, D, having one or more openings, I, in combination with the rotary picture-holder, C, when they serve to