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Contents:

(Illustrations are indicated by an asterisk.)

THE PRESSURE ON A SLIDE VALVE.

It is a popular idea that the number of square inches in the back of a slide valve, and the pounds of steam in the chest, represent the total pressure upon the valve. Another delusion is, that the pressure on a slide valve is equal to the pounds of steam per square inch on the back, minus the area of the steam ports. If we consider the valve to be a solid block of iron on a solid table, and mechanically tight, the steam would press on every square inch of surface with the same force that a dead weight laid upon it would. But these conditions are never found in a slide valve, except in one position; that one, when the valve laps over both ports, and the engine is at rest.

So soon, however, as the valve is moved the steam enters the open port and the pressure is practically taken off that end of it. When the valve is moved back over the port, the steam that is shut up within the cylinder will press up against the under side of the valve face with a force exactly equal to the pressure at the point in the stroke of the piston at which the valve closed. As the valve continues its stroke the other port will be opened, and the steam we have supposed shut up in the cylinder begins to exhaust; at this time, the pressure against the under side of the valve will be the pressure in the cylinder at the end of the stroke. This pressure is only for a brief period, however, for in a well constructed engine the time of exhausting the contents of the cylinder is very short. While the steam is entering the open port, then, and after the exhaust has passed through the closed port, the pressure on the under side of the valve will be just the ordinary back pressure, supposing the engine to be non-condensing—which is the supposition we have entertained in this discussion.

It is therefore unquestionable that to determine the pressure on a slide valve we must consider the pressure in the cylinder at the time of cutting off, at the end of the stroke, the area of the ports, the area of the back, and the back pressure on the piston.

THE REPORT ON SCREW THREADS.

The mechanical readers of this journal will be interested in the report on screw threads from the Committee of the Franklin Institute, which we publish in another part of this issue.

In common with the trade we have felt the necessity of reform in this particular, and have lost no opportunity of calling attention to it.

In regard to the decision of the Committee we think it a wise one, and a happy conclusion of an arduous duty. They recommend the adoption of the V-thread, flat on top, and flat in the bottom of the space, with pitches varying, of course, with the size of the bolt. The standard can be found in the report.

The thread recommended for adoption has for a long time been the most popular with good mechanics, as a fair compromise between a square and a triangular thread, also on account of the ease with which it is made and its durability, so that there will be no prejudices to overcome, and the adoption of it is more likely to meet with favor than a rounded top and bottom thread, which was properly discredited. Threads of this class, when new, always look as though they were half stripped, and they tend to strip quicker than others, for the very act of stripping is caused by one thread mounting or riding over the other; rounded threads facilitate this very greatly, especially with fine pitches.

In regard to the sizes for rough and finished nuts, there are some who will disagree with the decision of the Committee. They recommend that finished nuts and bolt heads be one-sixteenth smaller every way than rough nuts. It frequently happens that rough bolts and nuts are in close proximity on the same machine. If a rough five-eighth bolt head, with a finished nut is used, as is often the case, there is a difference in proportion apparent at once, and two wrenches must be provided where one would suffice. One wrench must be used for the rough bolts and another for the finished ones, and it is more likely that the largest wrench will be frequently used by careless men, on the smallest nuts, so that the corners will soon be rounded off. If we suppose that screw wrenches are always at hand, then these objections have no weight; but wrenches of that class are not always to be had, and when we speak of wrenches, it is of permanent ones, which are always sent with machines. There should be but one size for rough bolt heads and nuts and finished nuts; the excess for finishing should be allowed in forging, but should not be put forth as a standard. Since nuts are for the most part made in dies, now-a-days, there would be but little difficulty from want of exactness in the angles, so that the wrenches would fit. We have no disposition, to be hypercritical, however, and congratulate our mechanics that they have fallen into the hands of such able advisers on this subject, as composed the Committee, and not into the toils of schemers and theorists who would have confused instead of making the subject plain and practical.

THE FIELD OF INVENTION INEXHAUSTIBLE.

We have good reason to congratulate ourselves, as a people, upon the degree of perfection to which our inventors have brought domestic utensils. There is scarcely an article in common use which has not been very greatly improved within the last few years. Indeed there are many things entirely new and original in conception which add very much to the comfort and convenience of housekeepers.

Bread kneaders, knife scourers, potato mashers, butter workers, laundry stoves, adapted specially for heating sadirons, mechanical coffee roasters, pans for baking rolls so that an inviting and toothsome crust is left on all parts, top and bottom and sides, cleaners for kerosene oil chimneys, these and similar articles abound, and the modern American kitchen is incomplete without them.

Very many persons imagine that after one thing of a kind is invented every one else is excluded from that field and must ever after sit down and fold their hands, or else cast about for something as yet untried. This view is an erroneous one. Sterne, a modern English writer, makes one of his characters, "Uncle Toby," say to an intrusive fly which he is putting out of the window—"Go, the world is wide enough for me and thee." It is the same with invention, the world is wide enough for all, and it is not every article that suits all tastes.

It is fortunate for the general welfare that this is so, otherwise there would be no trade except a limited one, and the arts would come to a stand still. Every person who has any device for lessening or expediting work or performing it in another manner should see that it is brought prominently before the public without delay.

THE Chicago-Lake-Erie tunnel progresses at the rate of twelve feet in twenty-four hours.

IMPORTANT ENGLISH PATENT LAW CASE.

We are indebted to Mr. Hayes, Chief Clerk of the Patent Office, for the report of proceedings in the Court of Queen's Bench, on a demurrer, to the declaration in a petition of right claiming damages against the British Government for infringing a patent granted to Robert B. Feather for certain improvements in the construction of ships. The report of the trial was forwarded to Mr. Hayes, by George J. Abbott, Esq., U. S. Consul at Sheffield. The patentee claims to effect considerable economy in the building of ships or vessels, and at the same time add to the strength, buoyancy, and durability, and also to secure them against more extensive or fata injury arising from leakage in the constructing of ships or vessels of wood and iron combined, or what the patentee terms union-built vessels. The bottom and lower part of the frame of the hull of the vessel is to be constructed of timber, as heretofore, to about one-half, more or less, of the perpendicular hight of the vessel, exclusive of the bulwarks or top sides. From that point or mark, upwards, the vessel must be constructed of iron. To carry out this object sheets or plates of iron are raised upon stanchions or ribs made sufficiently strong, and formed with equalized saddle bars, set across the timber heads, main walls, and ceilings, over the futtocks to the keel inside, and outwardly as low as necessary, and firmly-bolted through them; or if preferred or considered more advantageous, the iron ribs or stanchions, with requisite receiving plates, could be introduced at suitable distances as for entire iron vessels. The intervening spaces between the ceilings and the walls are intended to be filled in solid to a sufficient depth to receive the bolts and fastenings of the iron ribs or stanchions, the upper portion of the main walls being laid diagonally either way, with a view to increased strength. The stem and stern post to be entirely of timber or of iron from the line of the union streak upwards.

The petitioner claimed damages to the extent of £10,000 sterling for infringement of his rights.

The Attorney General, who appeared to support the demurrer, argued, first:—"That these Letters Patent of inventions—and particularly this now before the court—are to be construed according to the general principles of law applicable to Crown grants, and that being so they will be found not to restrain the Crown from using an invention, or the grant of any privilege whatever as against the Crown. Second—That if the contrary construction were put upon such Letters Patent, particularly like that in this case, which relates to alleged inventions of the naval and military defence of the country, such Letters Patent would be against public policy and simply void as to restraining the Crown from its use. Third—That when we come to examine the statutes and authorities as to Letters Patent of inventions they will be found to contain nothing to invalidate but rather to support that conclusion. And, lastly, I submit if these arguments should fail to recommend themselves to your judgment, and you should hold against me on every one of these points, then the necessary consequence of such a conclusion is that the Crown is not liable on a petition of right; but if wrong has been done by individuals, whether by the Lords of the Admiralty or any other persons—if that be so, then the remedy is not by petition of right against the Crown, but by action against those who did the supposed wrong."

Mr. Bovill, who appeared for the petitioner, contended that there was not a trace in the experience of any living man of the Crown having asserted its right to use patents without payment to the patentee. And the astounding proposition is announced now for the first time that the Queen is entitled through the public departments to take what is the supposed private property of individuals and appropriate it without remuneration. In 1816 Sir William Congreve, who was then the director of the Artillery Department at Woolwich, was restrained from the use of Mr. Walker's patent. Sir William Congreve had supplied certain articles, and he was charged with a breach of the patent, and he was restrained by injunction, but it was not set up that Sir William Congreve was at liberty to use the invention for the good of the public service. Lord Eldon considered Sir William Congreve was not entitled to use the patent, but from the urgency and necessities of the case he was allowed to supply the articles for the

Government, an account, however, being kept for the remuneration of the patentee. The power of the Crown has reference only to the granting of a privilege, and not to any right in the invention, having no knowledge of it, and it was very different from those grants where there was some prerogative right, or a presumed prerogative right, possessed by the Crown, such as a grant of a fair or market and franchises of that character. After referring to the several authorities quoted by the learned Attorney General, he said:—

"If the case is to be de ermined with respect to considerations of public policy, how can any officer of the State rise up in his place and say it is public policy, in all cases of munitions and implements of war, to drive every inventor to foreign countries, because the inevitable result, if their lordships' judgment should be in favor of the Crown, will be to do that."

Mr. Bovill hit the nail square on the head; and we do not see how any sensible man can adopt any other view of the matter. The Lord Chief Justice, however, intimated that judgment in the case would be rendered in favor of the Crown, on the maxim, we suppose, that "the king can do no wrong."

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Grain and Grass Harvester.—This invention relates to an improved sickle-driving mechanism, whereby a requisite speed may be obtained by a very compact arrangement of parts. The invention also relates to a novel manner of applying the seat to the machine whereby the weight of the driver is made to act in the most favorable manner towards balancing the machine and in assisting in elevating the finger bar. The invention also relates to a lever applied and arranged in such a manner, relatively with the draught pole, as to cause the outer end of the finger bar to be elevated when the inner end of the same has been elevated a certain hight. The invention also relates to a new and improved shoe arranged and applied in such a manner as to support the front part of the machine and partially sustain the finger bar so that it will run lightly over the surface of the ground, and at the same time serve to protect the pitman which drives the sickle. The invention further relates to a novel manner of attaching the finger bar to the main frame of the machine, whereby a strong and durable joint connection is obtained. Frederick Nishwitz, of Brooklyn, N. Y., is the inventor.

Arrow Projectile.—This invention consists in the application to a projectile of a telescope stem provided with wings in such a manner that when the projectile is prepared for use said stem can be contracted within the limits of the cartridge bag, but when the charge is fired, and as soon as the projectile leaves the muzzle of the barrel, the stem elongates by its own inertia and gives balance and steadiness to the projectile in its flight, thereby increasing the range, velocity, and also the certainty of striking the object fired at. The wings being secured to the tubular end of the stem do not interfere with the revolving motion of the projectile if the same is fired from a rifled barrel. The stem is secured to a cap which is perforated with holes, and from the outer surface of which rises a rim with an internal screw thread which screws on the inner end of the projectile, leaving a shoulder for the soft metal ring to rest on, in such a manner that when said cap, with the telescope stem contracted, is introduced into the cartridge bag, said bag can be readily filled with powder through the perforations in the bag, and by screwing the projectile down into the rim of the cap, the edge of the cartridge bag is clamped between the soft metal ring and the shoulder of the cap, and no further fastening is required for it. Capt. Thomas S. Orwig, 219 Broadway, New York, is the inventor.

Rotary Engine.—This invention consists in two revolving piston wheels connected together by cog wheels and placed concentrically in two adjoining cylinders in combination with a valve which occupies the channel leading from one cylinder to the other, and to which motion is imparted by concentric or other equivalent means, mounted on the shafts of the piston wheels, in such a manner that said piston wheels and intervening valve are alternately acted upon by the steam passing through the channel connecting the two cylinders, and that by the action of the valve and piston wheels one cylinder takes steam while the other exhausts, and *vice versa.* The cog wheels which gear the two shafts of the pistons together are eccentric, the same as the pistons, so that their circumferential speed corresponds with that of said pistons. John P. Ellis, of 22d. Reg. Wis. Vol. Inf., Nashville, Tenn., is the inventor.

MARKET FOR THE MONTH.

The peculiarity in the trade during the month of February is the absence of fluctuations in the price of gold and other commodities. The prices of the leading staples on the 22d, compared with those on the last Wednesday in January, were as follows:—

	Price Jan. 25.	Price Feb. 22.
Coal (Anth.) ₩ 2,000 lb.	$12 00 @12 50	$14 00
Coffee (Java) ₩ lb.	47 @ 38	47 @ 48
Copper (Am. Ingot) ₩ lb.	45 @ 46½	44 @ 45
Cotton (middling) ₩ lb.	84 @ 85	83 @ 84
Flour (State) ₩ bbl.	$9 20 @ 9 70	$9 80 @10 40
Wheat ₩ bush.	Nominal.	2 50 @ 2 80
Hay ₩ 100 lb.	$1 50 @ 1 90	1 70
Hemp (Am. drs'd) ₩ tun.	320 00@390 00	$320 00@390 00
Hides (city slaughter) ₩ lb.	13 @ 13½	13 @ 13½
India-rubber ₩ lb.	72 @ 1 20	72 @ 1 15
Lead (Am.) ₩ 100 lb.	13 00	13 00
Nails ₩ 100 lb.	$8 50 @ 9 00	8 50
Petroleum (crude) ₩ gal.	45 @ 45½	45
Beef (mess) ₩ bbl.	$19 00 @24 00	18 00 @24 00
Saltpeter ₩ lb.	30	30
Steel (Am. cast) ₩ lb.	19 @ 34	19 @ 34
Sugar (brown) ₩ lb.	16 @ 22	15 @ 20
Wool (American Saxony fleece) ₩ lb.	90 @ 1 10	90 @ 1 10
Zinc ₩ lb.	18 @ 19	18 @ 18¼
Gold.	2 05	2 01

ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING FEBRUARY 21, 1865.

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.

46,435.—Horse Rakes.—Hubley Albright, Lewisburgh, Pa.:

I claim, first, The arrangement of the teeth bars, H, and bent rod, E, the latter being attached to the axle, A, as shown, and in such a relative position with the rake teeth, I, to operate as and for the purpose set forth.

Second, The lever, F, in combination with the bars, H F L, and the springs, O, all arranged and for the purpose specified.

46,436.—Rotary Engines.—Wm. Avens and Frederick Fradley, Brooklyn, N. Y.:

We claim the wheel, A, with one or more sets of chambers, B, which are provided each with two channels, d d', situated at opposite corners, in combination with ports, e e', valves, J, and cylinder, F, all constructed and operating substantially as and for the purpose set forth.

[This invention consists in a wheel provided with two sets of chambers, to each of which access is had by two channels situated on the opposite ends of the chambers, and tapering off in opposite directions, in combination with a cylinder fitting closely to the circumference of the wheel, and with valves which open and close the steam ports in such a manner that by admitting steam to the chambers of the wheel a rotary motion may be imparted to the same in either direction, and by a simple movement of the valves the motion of the engine can be reversed at any moment.]

46,437.—Bomb Lance for Killing Whales.—Silas Barker, Hartford, Conn.:

I claim, first, The arrangement of the mode of separation of the lance head, C, and fuse tube, F, from the shaft of the lance, substantially as described.

Second, The arrangement of the adjustable hollow exploding lance head, C, in the manner and for the purpose substantially as herein set forth and described.

46,438.—Adjustable Tool Holder.—Charles Petit Benoit, Detroit, Mich.:

I claim the adjustable holder, B, swiveled in the end of the stock, A, so as to adapt the tool for various kinds of work, substantially as set forth.

Second, In combination with a tool-holder, constructed and mounted as above specified, I claim the washer, E, having grooved or roughened surfaces, and employed in connection with the nut, C', for retaining the tool-holder in position, as explained.

46,439.—Machine for Riving Hoops.—George J. Bentley, Michigan City, Ind.:

I claim the combination of the grooved wheel, D, with the discs, F and F', the latter being suspended in hanging bearings, substantially as set forth.

46,440.—Churns.—Edwin L. Bergstresser, Berrysburg, Pa.:

I claim the double-acting dashers, with the steam reservoir and pipe, arranged and combined as herein described.

46,441.—Brushes for Cannon.—Paul Birchmeyer, Syracuse, N. Y.:

I claim as an article of manufacture an artillery sponge, constructed as described, that is to say, by laying a mat of horse or horned-cattle hair around a central hollow stock or head, and fastening it by a wrapping wire into the spiral groove, the semi-globular end being made by looping in a portion of the mat, as described.

46,442.—Weft-feeding Device for Hair-cloth Looms.—John Blanchard, Pawtucket, R. I. Ante-dated Feb. 16, 1865:

I claim the improved feeder for a hair-cloth loom described, constructed and operated substantially as herein specified.

46,443.—Leather and Process of Manufacturing the same.—Guiseppe Bottero, Boston, Mass.:

I claim the process above described, as well as the material or manufacture produced thereby.

46,444.—Street-lamp Posts.—Philip H. Branson, St. Louis, Mo.:

I claim as a new manufacture a lamp post, constructed in two parts, substantially in the manner and for the purpose herein set forth.

Second, I claim the employment of the chipping strips, C'', substantially as and for the purpose set forth.

46,445.—Variable Exhaust Nozzles.—Myron E. Brown, Buffalo, N. Y.:

I claim, first, Making a conical nozzle in two parts or halves, the said halves being hinged at the base, and so constructed that they lap past each other, so that when expanded by being moved upon their hinges, the lapping parts will prevent any break or opening between the halves, substantially as described and for the purposes set forth.

Second, I claim the flange, C', projecting inwardly inside the nozzle, for the purpose of breaking joints between the seat and base of the nozzle, and thus, by carrying the flange above the joint, prevent steam from escaping at the bottom of the nozzle, substantially as described.

46,446.—Tanning.—Church Burton, Union, Maine:

I claim the tanning of hides and skins with evergreen boughs, such as spruce and fir.

46,447.—Revolving Hay Rakes.—Ezra Calderwood, Portland, Maine:

I claim the combination with the thill, A', of the box, D, movable cap, c', and spring bolt, G, the latter engaging with the notched or recessed wheel, E, upon the rake head, all as herein described.

[This invention relates to a new and improved revolving rake, to be drawn either manually or by a horse, and it consists in a novel and simple means employed for holding the rake in working position, and which will admit of being readily actuated to liberate the rake, so that it may revolve and discharge its load when necessary.]

46,448.—Machine for Cutting Pasteboard.—Elizur E. Clarke, New Haven, Conn.:

First, I claim the method herein described of cutting pasteboard, by combining with fixed cutters and revolving cylinder a mechanism for raising and lowering the said cylinder to and from the cutters at given intervals of space, to more or less or not at all indent the pasteboard, or to produce a through cut at pleasure, substantially as set forth.

Second, I claim combining in one machine two cutter bars, provided with adjustable or fixed cutters, with two cylinders geared so as to revolve with equal velocities, one of the said cylinders revolving in fixed bearings, while the other, actuated by suitable mechanism, is raised to or lowered from the cutters, as herein described.

Third, In combination with adjustable or fixed collars and revolving cutter cylinder, I claim a cam cylinder, or wheel revolving in unison with the cutter cylinder, and actuating it to more or less impinge against the cutters at given intervals of space, substantially as set forth.

Fourth, I claim the combination with the cutters, cutter cylinder and cam wheel, a feed bar, actuated by the cam wheel, or any part, moving in unison therewith, in such manner as to feed the sheet to the cutters automatically and at proper intervals of time during the revolution of the cam wheel, to receive the through and score cut between given points, substantially as set forth.

Fifth, I claim the combination of the grooved and flanged disk, with detachable cams and clamps and screw bolts to fasten the cams to the periphery of the wheel, substantially as set forth.

Sixth, In combination with a machine for cutting pasteboard, I claim a sliding and adjustable platform, a table for receiving the scored and cut sheets, the arrangement being such that the said table may be slid under the main cylinder, so as to admit of the operator approaching the cutters to adjust them, substantially as set forth.

Seventh, I claim the combination of the cutter-holder and stock, fitted together by means of a vertical tongue and groove, with one or more horizontal guide tongues on the back of the stock, and fitting and sliding in a corresponding groove or grooves in the cutter bar, or the projecting studs or the cutter stock lapping over and under the cutter bar, together with a binding bolt passing through the central guide tongue, substantially as set forth.

Eighth, I claim the forked arm and grooved screw nut, working in combination with the inverted T-groove in the side of the cutter bars, with the binding screw bolts and nuts, substantially as described, for the purpose specified.

46,449.—Medical Compound.—Alfred P. Coryell, Janesville: Wis. Ante-dated Feb. 16, 1865:

I claim the use of a compound made of the ingredients above specified, mixed together in about the proportion, and substantially in the manner set forth.

46,450.—Horse Hay Forks.—James A. Cowles, Chicago, Ill.:

First, I claim the combination of the key or right-angled lever, f, with the ball pivoted at the eyes, p p, when said ball is located in the described situation, with the handle, c, and head, a a, as and for the purpose herein set forth.

Second, The combination of the head, a, handle, c, key or right-angled lever, f, catch, o o, and ball, in the manner and for the purpose described.

46,451.—Door Fastener.—Elliott H. Crane, Jonesville, Mich.:

I claim the combination of the segmental latch piece, B, vibrating on a pivot within a slot of the plate, A, and actuated by the spring, C, by which the plate being fastened in position the closing door forcing back the latch piece, which is forced to return when the edge of the door has passed it.

[This is a pocket contrivance, designed for use wherever a convenient temporary door lock is wanted. The improvement relates to a peculiarity of construction, by which a spring bolt is employed in such a manner as to have an automatic action, so that by the act of closing the door the latter becomes locked. This is a device that everybody wants, for it can be instantly applied to any door, without screws or nails.]

46,452.—Clothes Dryer.—Ephraim Culver, Shelburne, Mass.:

I claim the combination of the slotted and movable arm, c, the movable brace, d, and hub, l, and the screw and nut, e, substantially as and for the purpose described.

46,453.—Fishing-line Sinkers.—Ebenezer F. Decker, Southport, Maine:

I claim as my invention the combination of the guard ring, the line, the swivel, the sinker and the arms, D B, the whole being arranged substantially as specified.

46,454.—Plows.—John Deere, Moline, Ill.:

First, I claim the combination of the landside side, A, with the solid lugs, 3 3 3, and the perforated ear, 5, substantially as and for the purpose set forth.

Second, The lug, 3, cast on the landside, substantially as and for the purpose set forth.

Third, The guide and fastening ear, 5, in combination with the movable standard, substantially as and for the purpose set forth.

Fourth, The combination of the landside standard and mold board, by means and in the manner substantially as described.

Fifth, The construction of the shear, C, with the perforated ear, g, substantially as and for the purpose set forth.