

CALCULATION OF THE AMOUNT OF ICE WHICH CAN BE PRODUCED FROM A GIVEN AMOUNT OF COAL IN THE MODERN ICE MACHINE.

BY P. H. VANDER WEYDE, M.D.

The amount of ice produced by an ice machine, worked by means of an exhaust or condensing air pump, driven by steam power, is easily determined, theoretically, from the amount of coal burned in the furnace of the steam boiler. It has been proved that the combustion of one pound of anthracite coal produces, in round numbers, 14,000 units of heat, and that in order to freeze water of 72° Fah., it is necessary to abstract, besides 40° of sensible heat, 140° of latent heat—together 180°—which, for one pound of water is, of course, equivalent to 180 units of heat. As this number of units is the eightieth part of the 14,000 units produced by the combustion of one pound of coal, it is clear that the heat produced by the combustion of one ton of coal is equivalent to the heat to be abstracted from 80 tons of water of 72°, in order to change it into ice.

But in practice we find here exactly the same state of affairs as is the case with the steam engine. Theoretically, a steam engine ought to produce at least 700 units of force (foot-pounds) for every unit of heat consumed; in practice, good machinery only produces from about 70 to 100 foot-pounds, from about one tenth to one seventh part of the theoretical amount. In the best ice machines, thus far constructed, instead of freezing 80 tons of water for every ton of coal consumed, only from about 8 to 11 tons of ice are produced, also, from one tenth to one seventh part of the theoretical amount, proving, thus, the remarkable fact, that in both the steam engine and the ice machine, exactly the same relation exists between the theoretically calculated effects and the practical results.

As, however, all the best ice machines accomplish the conversion of the heat of the fuel into the freezing operation by the intervention of a steam engine, the fact that they practically produce only from one tenth to one seventh of the amount of the cold they theoretically should produce, is solely due to the other fact, that the steam engine, itself, practically produces only from one tenth to one seventh of the amount of power which would be strictly equivalent to the number of heat units consumed. It must not be lost sight of that it is only the power of the steam engine which generates the cold in the freezing machines, and that, therefore, improvements in the steam engine, which bring its practical results nearer to the theoretical standard, will at once exert their influence on the amount of ice the ice machines can produce, and, consequently, also on the cost of the ice manufactured in these machines.

Moreover, it appears that the kind of freezing machines in question, which convert power into cold, notwithstanding they are yet in their infancy, have already attained such a degree of excellence, that they are ahead of that class of machines which convert heat into power, either by steam, hot air, or any other possible means, as it is proved that they produce the full theoretical equivalent of cold (negative heat) for the number of foot-pounds employed; namely, cooling one pound of water one degree for a power equivalent to 700 foot-pounds, descending one foot, which, expressed in the adopted scientific manner, is one unit of negative heat for every 700 foot-pounds consumed.

Discovery of the Weight of Air.

The following extracts from a letter addressed to the *Chemical News* by the Abbé A. Hamy will be read with interest:

It has long been asserted that, before Galileo's experiment in 1643, the weight of air had not been demonstrated. However, many learned men, both of former times and of the present century, acknowledged that Aristotle attempted to demonstrate this important fact, while, at the same time, they were unanimous in declaring that the means employed by him were inadequate to the end he wished to accomplish. The honor of the great discovery is now yielded incontestably to Galileo, and what chance I shall stand of restoring the glory of it to the philosopher appears doubtful; but my conviction is, that he has a right to it, although his opinions on the nature of gravity differs from those of modern scientific men.

In "De Cælo," lib. 4, we read: "*Suo enim in loco gravitatem habent omnia præter ignem. Signum cuius est, utrem inflatam plus ponderis quam vacuum habere.*" "In their own medium, all bodies except heat, have weight; the proof of which is, that a leathern bottle weighs more when filled with air than it does when empty." It was, I believe, on this experiment that Aristotle founded his assertion of the gravity of air; and the only ground on which men of science based their opinion that the merit of the discovery was not due to him was, that in endeavoring themselves to test the truth of this assertion, many of them failed to detect any difference in weight between a bladder filled with air and one entirely empty. Such were the arguments used till the time of Galileo; then by the exact measurement of the gravity of air, the failure of Aristotle's experiment could be accounted for; and, during the present century, in all elementary books in which the barometer is mentioned the vain attempt of Aristotle to measure the real weight of air is also spoken of. But it appears to me, that the arguments used by the philosopher's enemies failed to prove what they really intend. Of course they are right if they can demonstrate that he experimented with air at the same pressure as that of the atmosphere. But what grounds have they for such an opinion? Is it that they attribute to Aristotle what are, in reality, the failures and mistakes of his followers? We have, on the one side, the clear assertion that all bodies except heat, possess weight; and, on the other, Aristotle furnishes us with a process for the verifi-

cation of this statement, which consists in weighing, not an extensible bladder, but an almost inextensible leathern jar successively full and empty of air. Now, what conclusion are we to arrive at from such premises? That it is impossible to succeed? Or might it not be more correct to say, that by a process, the details of which have not been transmitted to us, Aristotle himself succeeded in proving the gravity of air, while the attempts of his followers to do the same resulted in failure? For myself, I believe that the great philosopher, by means of a blow pipe, confined in his leathern jar more air than it would contain at the normal pressure; and, after weighing it, first empty and then full, he found such a difference that he could positively assert the gravity of air.

In these days, when *a priori* arguments are so decried, we may be allowed to dissent from a similar reasoning which would rob antiquity of its glories. Therefore, instead of saying, "Although Aristotle stated that air was heavy, he tested it by a wrong process which tended rather to prove the contrary," it would be more just to say, "Although Aristotle made use of a process, which, at first sight, appears a wrong one, yet, as we find that by the supposition of compressed air he might succeed, we conclude that he discovered the truth, since it was he who asserted the fact."

Self-Sealing Gas Retort Lids.

Self-sealing lids for gas retorts having a mechanically fitting edge, have been introduced in one of the London gas works, and are said to answer the purpose well. The lids are circular, and are stamped out of plate iron, being buckled to give them stiffness. The mouthpiece is faced true, and the projecting edge of the lid is truly turned to a semicircular section, so as to give only a line of bearing all around. Screwed up, this bearing is said to be, and to remain, gas tight, which is certainly more than would have been supposed. The makers of these lids, Messrs. Tangye Bros., of Birmingham, remark as follows:

The chief advantages obtained are: 1. The sound sealing of the retort during the whole time it is carbonizing the charge of coal, there being no jointing medium between the lid and the mouthpiece. 2. The lid requires no preparation on the part of the stoker, beyond slightly scraping the surface to remove entraneous grit or dirt. 3. The lids are only about two thirds the weight of the whole form in general use; a lid of a 16-in. mouthpiece weighing a little over 20 lbs. 4. The self-sealing lid reduces labor, saves wear and tear, obviates all the inconvenience and discomfort consequent on the preparation of luting, and effects a great reduction in the working expenses. The cost attending the process of "luting" in several large gas works exceeds £1,000 per annum, ranging in various works from 20s to 35s per mouthpiece. It will be obvious that a round lid is the most convenient and the cheapest form. Some engineers are having the mouthpieces of D-retorts adapted for round lids, by carrying the bottoms down the necessary depth for that purpose.

Boiler Inspector's Reports for June.

The Boiler Inspector's reports for June show that during the month 319 visits of inspection have been made, 573 boilers examined—465 externally and 139 internally—and 26 tested by hydraulic pressure. The whole number of defects discovered, 354; of which 31 were regarded as especially dangerous. These defects were distributed as follows: Furnaces out of shape, 16. Fractures in all, 56—2 dangerous. Burned plates, 45—1 dangerous. Blistered plates, 50—6 dangerous. Cases of incrustation and scale, 45. Cases of external corrosion, 33—4 dangerous. Cases of internal corrosion 2. Cases of internal grooving, 1. Water gages out of order, 5 Boilers without blow-out apparatus, 3. Blow-out apparatus out of order, 3—1 dangerous. Safety-valves overloaded, 7—3 dangerous. Steam gages out of order, 48—2 dangerous. Boilers without gages, 2. Boilers with loose stays, 2. Seam rips, 4—all dangerous. Mal-construction, 1—dangerous. Cases of deficiencies of water, 6—3 dangerous.

The *Locomotive* calls the attention of steam users to the necessity of exercising greater care in the raising of safety-valves. It says: "It is the practice of many, to lift the valve suddenly, and then let it fall, the spindle thereby receiving a violent blow; and in numerous cases we find the spindle sprung to such an extent by this practice, that the valve can lift but very little, and in some instances not at all. The valve should be raised carefully and let down gently; not only for the reasons above stated, but from the fact that nothing is more dangerous than the sudden shock caused by the valve being suddenly opened and shut. Valves should be frequently raised to prevent their becoming stuck, but too much care cannot be used in the operation.

"During the month, several cases of this evil have come to our knowledge, in one of which it was necessary to cut the spindle out, after the cap had been taken off."

ELECTRO-PLATING OF PAPER OR OTHER FIBROUS MATERIAL. The *Druggist's Circular* says: "A mode has been devised for depositing copper, silver, or gold, by the electric process, upon paper or any other fibrous material. This is accomplished by first rendering the paper a good conductor of electricity, without coating it with any material which will peel off. One of the best methods is to take a solution of nitrate of silver, pour in liquid ammonia till the precipitate formed at first is entirely dissolved again; then place the paper, silk, or muslin, for one or two hours in this solution. After taking it out and drying well, it is exposed to a current of hydrogen gas, by which operation the silver is reduced to a metallic state, and the material becomes so good a conductor of electricity that it may be electro-plated with copper, silver, or gold, in the usual manner. Material prepared in this manner may be employed for various useful and ornamental purposes.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

RAILROAD accidents succeed each other with alarming frequency, simply adding fresh chapters of horror, and shedding no fresh light on their cause. Railroad companies continue to assert through the press and in our law courts that they have made ample provision against these catastrophes in their bye-laws and regulations, that they are therefore responsible only in a subordinate degree, and that the blame and punishment must rest upon the officials immediately intrusted with the safety of the traveling public. The practice of these companies would seem to be to work their lines with the least possible cost and to reap the largest possible dividends. An open draw-bridge, a broken rail, or a defective axle is too often discovered by its effect upon a passenger train; or, again, a collision is the result of a sleeping—probably overtasked—engineer. The question to be considered is not are these railroad laws sufficient, but is there ample provision made for their due fulfillment.

We learn from an exchange that considerable excitement is felt in Wallingford and Shrewsbury, Vermont, upon the discovery of a mountain of lead. This mountain formerly belonged to the late Morton Dawson. Last spring a son of his, in making sugar, built an arch of the loose stone found in that section. After adjusting his pan and kindling a fire, he noticed melted lead or solder run out of the fire. He supposed his pan was melting down, and removed it, but found it entire, and also found that the melted metal came from the stones of the arch. It is said that specimens have been sent to Washington, New York, and Boston, for examination.

At the coming fair at St. Louis, a large amount is to be distributed in premiums for cotton. The *St. Louis Republican* says: "We understand that these premiums will be awarded as follows:—For the best bale of upland or short staple cotton \$500. For the best bale of New Orleans, or long staple cotton \$500. The St. Louis Fair Association have added to this third premium of \$250 for the best bale of cotton raised in Missouri. The cotton entered must be of the growth of 1869, and the bales must not weigh less than 450 pounds each. Sea Island and Peeler cotton are excluded from competition.

The acidity of mine waters, so often noticed and so deleterious to steam boilers, has been the subject of some remarks by Dr. Willigk, who has analyzed water from a coal pit in Bohemia. It contained acid sulphates and free sulphuric acid in notable quantity. He recommended that it should be filtered over witherite (natural carbonate of baryta), which is abundant in the locality. The experiment was successful, and prevented the corrosion of the boilers or machinery. Chalk or limestone would have proved equally efficacious.

Two thirds of all the prints made in the United States are produced in New England. Massachusetts and New Hampshire can print from ninety to ninety-five thousand pieces weekly; New York State, New Jersey, and Pennsylvania can print about ninety thousand weekly. Of all these there are three of the largest printing companies that have a capacity to print one half of this whole production.

Thirteen hundred and fifty men were engaged in changing the gage of the Missouri Pacific Railroad. So complete were the preparations and facilities that the feat was accomplished in the incredible short time of twelve hours, and without the loss or delay of a single train. The business of the road is progressing now as usual.

Isaac Heene, of Duxbury, Mass., being invited to address a school, responded by offering each scholar an acre of good land to plant on shares, he manuring and plowing the same, and promising in two years to give a clear title to such as had improved the land in a farm-like manner.

It is officially announced by M. Lesseps, that the ceremonies of the opening of the Suez canal will take place on the 17th of next November. The two great enterprises by which the year 1869 will be distinguished in history, are the Union Pacific railroad and the Suez canal.

The colored mechanics of Baltimore, and the State of Maryland, are forming trades unions and societies of their own, as the white workingmen deny them admission to their unions.

The construction of a ship canal from New Orleans to Lake Pontchartrain, it is asserted, would diminish greatly the port charges in pilotage and towage.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; beside, as sometimes happens, we may prefer to address correspondents by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at \$1.00 a line, under the head of "Business and Personal."

All reference to back numbers should be by volume and page.

A. S. G., of D. C.—The power necessary to drive a train of wheelwork seven hours, so that a driven wheel, one inch in diameter, may revolve 40 revolutions per minute, with four pounds at its periphery, may be computed as follows: 1 inch \times 31416 = 31416 inches, \times 40 = 125664 inches the circumferential motion per minute. This multiplied by 420, the number of minutes in seven hours, = 5277888 inches = 439824 feet. As four pounds of resistance are to be overcome through this distance in seven hours we have for the power required 1759296 foot-pounds. To accomplish this work by a weight falling through a space of seven feet, the weight must weigh one seventh of 1759296 pounds, which is 251328 pounds making no allowance for friction, which will, we estimate, require in your case, twenty per cent more power than this, making the entire weight required, nearly 3,016 pounds.

C. R. F., of N. J.—As good a tool as you can use for roughing down a large wooden drum on the shaft where it is to run, is an old file ground down to a sharp point. This will not split off fragments even though it should catch in a knot or a nail. When the approximate form has been attained you can use a gouge, chisel, and sandpaper to finish. A rest good enough for the purpose can generally be made of hard-wood plank suspended with nails from and braced to the joists overhead.

T. R. J., of Mass.—The best tool to burr off small castings is a vulcanized emery wheel. If you have much such work to do it will pay for itself soon in the saving of files. To remove the rust from such castings, put them in a bushel at once—in a tumbling barrel, with leather cuttings and chips, they will soon wear bright. This will not however take the rust from the inside of small hollow castings. To clean such, dip in dilute sulphuric acid—1 part of commercial acid to ten of water—wash in hot lime water, and dry in the tumbler with dry sawdust.

H. H., of Ohio.—Experiment can only determine your first query. We think, however, that you will find it difficult to make an alloy of platinum and silver, whose fusing point will be exactly what you require. The asbestos used in making clothing is a variety of amphibole not containing much alumina.

C. R., of Vt.—Saws may be made to cut so smoothly that a very good finish may be obtained by sand-papering only. You will find such saws at work in manufactories of veneers, and it would pay you to be fore proceeding further with your invention to visit some such establishment.

S. McN., of Cal.—The substance you send us is nothing but wood charcoal mixed with a little sand and sufficient plastic clay to cement it into lumps. How it came fifty feet below the surface where you found it must be a matter of conjecture. Charcoal is however, unchangeable at ordinary temperatures, and it may have remained there a thousand years.

A. G., of N. Y.—Good strong glue is the best thing for fixing emery to cloth belts for polishing wood.

P. O., of Mich.—You are mistaken in supposing a cylindrical adju- tage will permit the larzest flow of water. The form which permits the greatest flow is that of a truncated cone with its base in the direction of the flow.

Va.—The object of this invention is to provide a simple, cheap, and durable brace adapted to be fastened to the cross ties so as to press against the outer side of the rail, and support it at the joints and elsewhere, and at the same time to hold the rail in place and prevent its sliding or "working" enwise on steep grades.

APPARATUS FOR OILING MACHINERY.—Chas. A. Morton, Bladeford, Me.—The object of this invention is to provide an oiling apparatus for machinery, whereby the oil may be supplied in measured quantities and thrown in jets in such places as it is difficult to reach readily, and which may be also used with equal facility for ordinary purposes.

Business and Personal.

The Charge for Insertion under this head is One Dollar a Line. If the Notices exceed Four Lines, One Dollar and a Half per line will be charged.

Send for Agents' Circular—Hinkley Knitting Machine Co., 176 Broadway.

Balloon netting, strong and large, for sale. Box 896, Dayton, O.

Cochrane's low water steam port—The best safeguard against explosions and burning. Manufactured by J. C. Cochrane, Rochester, N.Y.

Carroll County Agricultural Fair, to be held at Westminster, Md., for four days, commencing on the 28th September, 1869. For premium lists address Wm. A. McKellip, Sec., Westminster, Md.

The Phœnicopticon—An application of the principle of the Zoetrope to the Magic Lantern. Patent for sale. Send for circular. O. B. Brown, 126 Tremont st., Boston.

Send for a circular on the uses of Soluble Glass, or Silicates of Soda and Potash. Manufactured by L. & J. W. Feuchtwangner, Chemists and Drug Importers, 55 Cedar st., New York.

If you want to buy or hire a first-class factory or machine shop of moderate size, within easy access of New York city, read advertisement on last page.

Working mechanical drawings a specialty. R. Thompson, Bridgeport, Conn.

Glass signs and Cards.—Artistic and mechanical methods of gilding, pearling, and embossing lettering, borders, etc., on reverse of glass. Complete instructions sent for \$3. J. O. Belknap, 112 Broadway, New York. References given if required.

Wanted—An intelligent machinist and blacksmith to make grindstone shafts and take charge of shop. Send address, reference, and wages to J. E. Mitchell, 310 York Ave., Philadelphia.

Scientific American, New Series, complete, 20 volumes, neatly and uniformly bound, for sale. Price \$60. Address Theo. Tusch, City Agent, Room 29, No. 37 Park Row, New York city.

An end to the explosion of lamps.—No accidents, no loss of life can occur where the Aparentt is used. It can be applied to any kind of lamp or can. Address Van Wilhem & Co., Box 506, Pittsburgh, Pa. "A perfect protection."—Scientific American.

Peck's patent drop press. Milo Peck & Co., New Haven, Ct.

The Best and Cheapest Boiler-flue Cleaner is Morse's. Send to A. H. & M. Morse, Franklin, Mass., for circular. Agents wanted.

If you have a Patent to sell, or desire any article manufactured or introduced, address National Patent Exchange, Buffalo, N. Y.

To Manufacturers or Patentees.—Wanted.—By a responsible hardware house, long established in the city of New York, the agency or the right to manufacture some good patented article in their line of trade. Address P. D. & Co., Postoffice Box 3517.

Continental Screw Company's Stock wanted. Address J. C. Clark, 66 Leonard st., New York.

For sale.—A valuable Patent Right for an effective army and cotton worm destroyer. 20 bales of cotton saved in one day. Address Charles Steinmann, Napoleonville, La.

Mill-stone dressing diamond machine, simple, effective, durable Also, Glazier's diamonds. John Dickinson, 61 Nassau st., New York.

Leschot's Patent Diamond-pointed Steam Drills save, on the average, fifty per cent of the cost of rock drilling. Manufactured only by Severance & Holt, 16 Wall st., New York.

Tempered steel spiral springs made to order. John Chatillon, 91 and 93 Cliff st., New York.

The Tanite Emery Wheel—see advertisement on inside page.

For solid wrought-iron beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

Machinists, boiler makers, tanners, and workers of sheet metals read advertisement of Parker's Power Presses.

Diamond carbon, formed into wedge or other shapes for pointing and edging tools or cutters for drilling and working stone, etc. Send stamp for circular. John Dickinson, 61 Nassau st., New York.

The paper that meets the eye of manufacturers throughout the United States—The Boston Bulletin. \$4.00 a year. Adv'g 17c. a line.

Winans' boiler powder, 11 Wall st., N. Y., removes Incrustations without injury or foaming 12 years in use. Beware of imitations.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

WINDOW SHADE AND CURTAIN FIXTURE.—J. W. Foard, San Francisco, Cal.—The object of this invention is to produce an improved device for adjusting the tension of the cords used in operating window shades or blinds.

MINING MACHINE.—David Morris, Bartlett, Ohio.—The object of this invention is to produce a new and improved instrument for cutting out coal in the mines, which will operate more easily and conveniently, and with greater effect, than any heretofore in use.

RAILROAD JOINT AND TRACK BRACE.—Granville E. Jarvis, Grafton, West

ROTARY OVEN.—D. A. Kennedy, Darien, Wis.—This invention has for its object to furnish a simple, convenient, and effective oven, which shall be so constructed and arranged as to do its work better, and with less expenditure of fuel, than the ovens constructed in the ordinary manner.

EAVERS-TROUGH.—Lewis Granger and Luke Phillips, Memphis, Mich.—This invention has for its object to furnish an improved machine, by means of which eaves-troughs may be easily, quickly, conveniently, and accurately formed.

SHELVING FOR STORES.—William Koch and George Koch, Cass, Pa.—This invention has for its object to furnish an improved mode of constructing store shelves, which will enable the shelves, and the goods which they contain, to be quickly removed from the store, should it become necessary on account of fire or other accident.

SAFETY STOVE FOR RAILROAD CARS.—Cyrus Sanborn, Chichester, N. H.—This invention has for its object to furnish an improved railroad stove, which shall be so constructed and arranged, that should the car or stove be accidentally overturned the fire may be extinguished before it can do any damage, and which shall, at the same time, be simple in construction, and will occupy small space in the car.

CORN PLANTER.—H. C. Beshler, Berrysburgh, Pa.—This invention has for its object to furnish a simple, strong, durable, reliable, and cheap corn planter, and which shall be so constructed that it may be conveniently adjusted to drop the corn continuously, kernel by kernel, or in hills, as may be desired.

FLOW BRAMS.—James L. Baldwin, Troy, Pa.—This invention has for its object to furnish an improvement in the construction of plow beams, so as to diminish the shock when the plow strikes an obstruction, to prevent the plow from being broken or the team from being injured, and which shall be simple in construction, inexpensive, and readily applied.

TUB.—Ezra Caswell, Lyons, N. Y.—This invention has for its object to furnish an improved means of connecting the cover, or lid, with, and securing it to the body of the tub, so as to make the said tub perfectly tight, and which shall at the same time be simple in construction, effective in operation, and easily and conveniently operated.

MEASURE HOLDER.—George W. Hulse, Zanesville, Ohio.—This invention has for its object to furnish an improved holder for holding the measures in which molasses, sirups, oils, etc., have been measured, which shall be so constructed as to allow the drainings from the measure to run back into the cask, and at the same time protect the measure and cask from flies and dust.

TIRE UPSITTER.—N. P. Quick, Carmel, N. Y.—This invention has for its object to furnish an improved tire upsitter, which shall be so constructed and arranged that it may be readily attached to the rear part of the anvil, and easily detached when no longer required for use, and which shall at the same time be simple in construction and effective in operation.

CENTRIFUGAL HULLING MILL.—Charles S. Bailey, New York city.—This invention has for its object to furnish a simple, convenient, and effective hulling mill, designed especially for hulling cotton seeds, but which may be applied with equal facility and advantage for hulling other seeds, and which shall at the same time be so constructed as to remove automatically nails or other pieces of iron that may have got into the seed accidentally.

PLANT PROTECTOR ATTACHMENT TO PLOWS.—John Ahearn, Baltimore, Md.—The object of this invention is to provide an easily adjusted plant protector for plows, such as are used for plowing between the rows of young plants for cultivating, that can be readily attached to any size or style of plow, whether single or double moldboard, without driving screws, or boring holes in any part of the plow, and which may be readily adjusted to allow more or less earth to be turned up toward the plants in the rows and turn the clods back into the furrow.

COTTON SEED PLANTER.—J. M. Elliott, Winnsborough, S.C.—This invention consists of a peculiar arrangement in a one-wheel planter of an adjustable plow, relatively to the wheel, so as to be gaged by it. Also, of an improved arrangement of feeding pin wheel and fixed pins in a hopper surrounding in part the axle of the supporting wheel. Also, certain other details of arrangement.

DUST PAN.—P. A. Schanck, Matawan, N.J.—This invention consists in providing a stiffening plate for the mouth, to prevent it from bending upward and in so shaping the bottom, that, when resting on the floor, the edge will fit closely to the floor, and admit of sweeping the dust into it without requiring the heel to be held up by one hand to bring the edge down, as must be done with those now in use.

HARROWS.—E. A. Goodes, Philadelphia, Pa.—This invention relates to improvements in harrows designed to adapt them to work in uneven ground and also for transportation to or from the place of operation more advantageously than any now in use.

SMOOTHING-IRON POLISHER AND GLOSSER.—James Davies, East New York, L. I.—The object of this invention is to provide a simple and convenient implement for polishing sad-irons to remove the starch, which sometimes adheres to the faces thereof, when ironing and also to lubricate the same, with a substance which will cause the iron to impart a glossy surface to the starched clothes.

MACHINE FOR DRESSING FEATHERS.—Robert Glore, Nashville, Tenn.—This invention relates to improvements in machines for dressing feathers by steaming, designed to provide a more efficient apparatus than any now in use; and consists in an improved arrangement of heating tubes and valves within the cylinder commonly used in machines of this character.

CAR COUPLING.—W. C. Tilton, Spring Place, Ga.—This invention relates to improvements in car couplings, designed to provide an arrangement whereby they may be self-coupling and thereby prevent the necessity for an attendant to stand between the cars when they come together to present the links to the openings in the buffer heads, whereby persons are frequently severely injured.

COOKING AND HEATING RANGE.—C. K. Edwards, New York city.—This invention relates to improvements in ranges having for its object to provide certain improvements in the arrangement of the fire part, calculated to concentrate the heat either under the kettle holes or under the oven when required or to equalize it between the two. Also, to provide in connection with the improved cooking ranges, heating chambers or radiators for heating air and giving it off to conducting pipes to be conveyed to rooms for heating.

FLEECE BUNDLING APPARATUS.—Jas. Walton, Roseburg, Oregon.—This invention relates to improvements in apparatus for bundling fleeces of wool and other substances of like character, and has for its object to provide a means for accomplishing the same more rapidly and in a better manner than can be done by any devices now in use. It consists of a compressing case, having three fixed sides, two folding sides, and a vertically moving bottom in which the wool or other substance is compressed, cords being previously arranged in the said case and held by hooks around the bottom and prongs of a trifurcated cover and other hooks, so that they will encircle the bundle twice laterally and once longitudinally for tying when it has been fully compressed by the folding sides and movable bottom. The cords are disconnected from the bottom hooks by the upward movement of the bottom in compressing the bundle.

MACHINE FOR CROSSING THE FIBER OF FELTS, BATS, WADDING, ETC.—L. Robinson, Matteawan, N. Y.—This invention consists of a machine having a broad platform over which the fabric is passed back and forth from the carding machine, whereon suitable rolling or laying mechanism is placed to receive a thin webbing from another carding machine delivered in a direction perpendicular to that in which the first named fabric moves, and deliver it under the pressure of the laying rollers moving back and forth, and laying it in a zig-zag course as the fabric moves in one direction, the vacant angles being filled as the fabric is moved in the other direction.

GAGE ATTACHMENT FOR HEAD BLOCKS.—Nathan Hunt, Salem, Ohio.—This invention consists of a sliding nut applied to a dovetailed way on the bracket of the head block, and capable of being readily clamped to the said way to move with it or loosened to slide back on it after setting, and provided with a screwed rod sliding freely through a fixed bracket in the same direction with the nut, and having a collar, which, striking against the face of the bracket through which it slides, arrests the motion of the nut and the sliding bracket, at the point required for setting the log. The said nut is then released from the bracket to which it is clamped while setting, and drawn back together with and by the said screwed rod against a stop preparatory to the next setting, and then clamped to the way or bracket again. The invention also embraces certain swinging stops to be interposed between the collar of the screw and the arresting bracket, to be used where required for setting for stuff of different thicknesses.

LID LIFTER.—Wm. Worley, Newark, West Virginia.—This invention relates to a new and useful household implement, designed for various purposes.

RAT AND GAME TRAP.—Thomas B. Van Pelt, Westport, Mo.—This invention relates to new and useful improvements in traps for catching rats and other animals.

HAT MACHINE.—John D. Parsons, Yonkers, N. Y.—This invention relates to a new and improved method of brushing the brims of hats while they are being manufactured.

MOUNTING PICTURES.—C. J. Billingham, McArthur, Ohio.—This invention relates to a new and useful improvement in the operation of mounting photographs and other similar pictures.

FIREARMS.—L. T. Delassize, New Orleans, La.—This invention relates to new and useful improvements in firearms.

BRICK MACHINE.—S. W. Bennett, Jr., Monroe, La.—This invention relates to a new and improved machine for making bricks, and has for its object simplicity and economy in construction, rapidity of execution, and pressure power requisite to form perfect bricks from well-tempered clay.

PORTABLE AND CONVERTIBLE COFFER DAM.—Samuel Lewis, Williamsburgh, N. Y.—This invention relates to a new and improved method of constructing coffer dams for building piers and other submarine structures, and in making the same convertible into other forms, for raising sunken vessels; and it consists in forming the coffer dam in two or more sections, the sides of which are partitioned off into water and air-tight compartments, each section having a removable side, and all the sides being provided with suitable tubes and other appliances for filling the compartments with either air or water at all times, whereby the sections may be submerged or floated, as may be desired. It also consists in so constructing the coffer dam, that it may be made (with two of its sections) to inclose a sunken vessel, thereby affording means for raising the same. Patented July 6, 1869.

MACHINE FOR THRASHING AND HULLING CLOVER SEED.—Z. Miller, Canal Fulton, Ohio.—This invention has for its object to furnish an improved machine for thrashing and hulling clover seed, which shall be simple in construction and effective in operation.

HORSE COLLAR.—Jacques Meyer, Williamsburgh, N. Y.—This invention relates to certain improvements in horse collars, whereby the same can be made adaptable to all sizes of horses' necks, and whereby separate hames can be dispensed with. The invention consists in the application within the leathering covering of a wooden stay, or frame, whereby the collar is made strong and stiff, and whereby the use of hames is dispensed with.

STOCK SHED AND RACK.—T. Brod. Myers, Palatine, West Virginia.—This invention relates to a new sheep shed and rack, which is so constructed that the roof can be readily swung up to protect the animals from the inclemency of the weather, while it can as readily be thrown into a vertical position to keep the animals away from the rack while the same is being filled with hay. The roof can also be entirely removed during fine weather.

MACHINERY FOR FEEDING WOOL AND OTHER FIBERS TO PREPARING AND CARDING MACHINES.—Wm. Clissold, Duabridge Works, near Stroud, county of Gloucester, England.—This invention relates to a new feeding apparatus, which consists of a box (for receiving the fibers to be fed) fitted with a bottom formed of reciprocating bars, which move forward the fibers to the discharging mouth at the front end of the box. Over the discharging mouth works a pair of inclined reciprocating transverse comb plates, which slide in vertical guides and mass the fiber as it passes from the box into a loose, thick sheet or bat.

PLOW.—A. N. Edwards, Greenville, Ala.—This invention relates to a new fastening device for plows and shovels of all kinds, its object being to retain the share firmly and still to allow the ready removal and replacement of the same, so that shares and shovels of different kinds may be used on one standard.

POCKET OIL CAN.—John P. Haines, New York city.—This invention relates to an improved oil can for lubricating purposes, so constructed that it can be readily carried in the pocket of a person, to be used when required without soiling or tearing said pocket, or otherwise injuring the garments or soiling the hands of the party using it.

WATER AND STEAM ENGINES.—I. N. Forrester, Bridgeport, Conn.—This invention relates to a new manner of operating the slide valve on water and steam engines on which a fly-wheel cannot be applied, and has for its object to prevent the stopping of the engine when the slide valve, during its passage from one port to the other, closes both.

DAMPENING ATTACHMENT TO LITHOGRAPHIC MACHINES.—Jonathan Walton, Brooklyn, N. Y.—This invention relates to a new apparatus for dampening lithographic stones in printing machines, and has for its object to regulate the amount of moisture imparted to the stone at each move, and also to adjust the device to longer or shorter stones.

ADJUSTABLE STEP LADDER.—Robert R. Croasdale and Peter Rink, Reaville, N. J.—This invention has for its object to construct a step ladder, in which the steps can be adjusted into a horizontal position, whereby it may be the degree of elevation of the ladder. The invention consists in pivoting each end of each step in two side bars, so that the latter will be adjustable to set the steps at any angle to the bars; and in providing a brace frame which has an up-and-down adjustable connecting rod.