#### ENGINEERING INVENTIONS.

An elevator has been patented by Mr. Geo. A. Saxer, of New Brighton, N. Y. By various combinations of devices in connection with the hoisting rope, ping appliances being moved independently of the car, a great degree of safety is obtained, and every facility afforded for managing the car.

A safety shell for blasting has been patented by Mr. George Freund, of Durango, Colo. This invention covers certain novel forms of construction, as improvements on invention patented by same invent. the whisk thereof. or last year, the object being to obtain greater safety, not only in handling material, but in tamping the charge and connecting the fuse to the stick, candle, or other form of explosive material.

A bell ringing attachment for locomotives has been patented by Mr. Pennock M. Way, of Thurlow, Pa. The bell is suspended in the usual manner from a journaled yoke or shaft, and by suitable belt or gearing is connected with the running part of the locomotive, but so that this gearing may be thrown in and out very easily, thus enabling the bell to be rung automatically

A steam boiler or novel means of combus tion of gases in the fire box before they pass to the boiler tubes, has been patented by Mr. John Alves, of Dunedin, New Zealand. A construction is provided discharged over the fire, and also from a projection forward from the bridge walls into the center of the fur-

A steam pumping engine has been patented by Mr. Edward G. Shortt, of Carthage, N. Y. It is direct-acting, with the pump piston and steam piston connected together and working in unison in a contain- their resistance to wear, and in this way being especially ing case, one end of which forms the pump, the other having valves and ports, and making an engine within the same case. This invention covers several features of improvement on a patent issued to the same inventor in 1881.

has been patented by Mr. Amedee M. G. Sebillot, of Paris, France. This invention covers an improvement on an ore furnace of the same inventor patented last year. In a tunnel-shaped furnace is a tunnel-shaped muffle, connected by flues with a receiver for the gas of the materials in the cars, which fit closely within the muffle, and are slowly moved therein by an endless chain in a gutter or trough in the bottom of the furnace, the chain baving catches to take hold of projectious from the bottoms of the cars.

#### MECHANICAL INVENTIONS.

An improved saw set has been patented by novel construction and arrangement of parts, to be worked by the foot of the user, and so the hammer delivers upon the saw teeth a blow of uniform force, regulated with precision by a thumb screw; the blow may be made heavy or light, for thick or thin saws, but its force is adjusted as desired by the thumb screw.

A lifting jack has been patented by Mr. Benjamin F. Mansfield, of Centerville, Oregon. Atoothed wheel is rigidly mounted on a screw spindle below the head, the wheel being held between the shanks of the forked end of a lever; two pawls are pivoted on opposite sides of this forked end, their inner ends being pressed outwardly by springs, so the outer ends engage with the teeth of the tootbed wheel, the whole making it easy to rapidly raise and lower the screw

An improved jack has been patented by Mr. Samuel J. Wisdom, of Montgomery, Ala. The object of the invention is to obtain a compact and powerful means of purchase for removing piston rods from the cross heads of steam engines, etc., for which is provided a cone-pointed screw, a nut in which it works, and means to take the wedge strain, by which great power can be applied without need of hammering or bruising the fluished parts.

An improved loose collar attachment for hanging circular saws has been patented by Mr. William D. Sherman, of Grand Haven, Mich. By this means the lug or driving pins projecting from the fast | Haven, Mich. It provides for a weighted lever worked collar of the arbor, and passing through holes in the saw and loose collar, are so connected as to relieve the lug pins of wear, strain, and breakage, and hold the loose collar as firmly as a fast one, while preventing irregularities or obstructions in the holes of the lug pins

#### -----AGRICULTURAL INVENTIONS

A corn planter has been patented by Mr. Thomas Bell, of Shelby City, Ky. It is simple in construction, strong, light, and durable, will drop the corn at the required distances, and has an automatic marker indicating the position of the corn dropped, thereby ring it easy to pass obstructions and plant the corn

A separator for grain has been patented by Mr. Frank L. Kidder, of Terre Haute, Ind. This invention provides for a separator formed of screws with tion provides for a separator formed of screws, with connected threads intermeshing but not in contact with box, more especially designed for separating the kereach other, and mechanism to rotate the adjacent surfaces of each pair of screws in apposite directions, in combination with a suitably arranged box, supply tube,

## MISCELLANEOUS INVENTIONS.

A mail sack tag has been patented by Mr. George W. Dwenger, of Brooklyn, N. Y. It is formed of a rigid piece with a longitudinal beveled slot, a tran- button. verse slot, and a spring tongue, and can be easily and rapidly attached and detached from mail sacks or bags.

A toy target has been patented by Messrs. Arthur H. Hoffman and William F. Lloyd, of East New York, and Joseph H. Block, of Brooklyn, N. Y. It is a simple and amusing toy for children, combining toy cannon with different targets, figures, etc., and can he manufactured at small cost.

A skewer puller has been patented by Mr. Augustus F. Friend, of Gravesend, N. Y. It is intended to facilitate the withdrawal of skewers from cooked meats, and provides for handles pivoted to each other including pawls, brakes, and safety wedges, the stop- at their forward ends, where are jaws with their faces concaved.

> A broom holder has been patented by Mr. Herman C. Berg, of College Point, N.Y. This is an exceedingly simple device, made of a single piece of wire, bent in such shape that it may be attached to the ed by Mr. Robert W. Turner, of Thornton, Tex. This wall and will hold the broom in an inverted position by invention is primarily designed to facilitate the reduc-

A shading pencil has been patented by Mr. George B. Hecklinger, of Streator, Ill. It provides for a handle inclosing leads of different colors placed side by side, which permits of two or more such leads being used simultaneously, so that a mark shaded in different colors may be made at a single stroke.

A door and gate latch has been patented by Mr. Charles Wormuth, of Little Falls, N. Y. This invention covers improvements in latches with reverselyhooked ends to engage catches on door or gate frame and the wall, and, while simple, strong, and durable, can be used to hold a door or gate open or closed,

A butter cutter has been patented by Mr. Newtou H. Sweet, of Stephentown Center, N. Y. It is an improved device for removing butter, lard, etc., from jars and tubs, in regular shaped cakes or blocks, for by which air posses under the grate bars and in the which may be made of specified sizes; it may also be rear of the bridge wall, from the sides of which it is used as a butter trier, and that which is not required may be placed back in the tub.

A sole for rubber boots and shoes has been patented by Mr. Henry A. Wattson, of Granite, Colo. This invention covers the making of the soles and heels of rubber boots and shoes with metallic studs embedded in the solid body of the sole, thereby greatly increasing desirable for miners' use.

A filter has been patented by Mr. Justin Durel, of New Orleans. La. This invention provides for filtering, under pressure of a force pump, such liquors as the cane juice or sirup of sugar plantations, so A furnace for treating ores continuously that the sediment and coarse matters will settle away from rather than be forced through the filter proper, and the filter can be easily cleaned.

> An improved roller fixture has been patented by Mr. James H. Skidmore, of New York city. It is constructed with a bracket with an open bearing to receive a roller pivot, and with a fastener so the pivot will be kept from accidental displacement, to prevent shade, towel, and other rollers from getting out of their sup-

A checker and baseball combination game as been patented by Mr. Hiram S. Towner, of Dutton, Mich. The game board is divided after the manner of a checker board, with additional outside squares, and the game is played with two sets of stones of nine men Mr. John S. Long, of Murphysborough, Ill. It is a in each set, designated by letters in the way players of baseball are put down in the score books.

> An ash sifter has been patented by Mr. William T. Adams, of Baltimore, Md. This is a combination of a sieve, slanting shelf, and drawers, inclosed and arranged in a suitable box, whereby, when the efuse coal and ashes are dumped together, the box may be closed, the sifting done without dust, and the coal deposited in one receptacle and the ashes in another.

> An improved tuyere has been patented by Mr. Enoch P. H. Martin, of Wilmington, Del. An annular space surrounds the central space through which cinders and ashes fall from the fire above, this space being protected from the cinders, and from thence air is distributed to the fire, so the fire will not clog, a better consumption will be effected, with economy of coal and labor in cleaning out ashes is saved.

> An apparatus for bottling and siruping aerated beverages has been patented by Messrs. James McEwen and Simeon Spencer, of Manchester, Eng. There is an acrated water cylinder, and valve operated by a cam or eccentric on a revolving shaft, an adjustable valve controls the sirup charge, there are revolving bottle carriers, and the operation is such as to allow the air to escape from the bottles being filled.

An unlocking attachment for time locks has been patented by Mr. Hiram P. Pruim, of Grand by the mechanism of the lock, and connected by a pawl and ratchet wheel with a train of gear wheels operating a rack bar with a trip arm to engage with the trip latch of a time lock, so the latch can be tripped by the coninued movement of the combination lock mechanism.

A recording table or desk has been patented by Mr. Mathew S. Holt, of Weston, W. Va. This invention covers a novel construction whereby, with a supplemental leaf, a large book may be held with its many leaves are turned over, the adjacent leaf may be on in same plane with the top of the table.

A separator and conveyer has been patentinvention covers a screw conveyer with flights in secnels of cotton seed from the hulls after passing through the huller.

An improved pearl button has been patented by Mr. Henry Smith, of Newark, N. J. The object of this invention is to improve the construction of buttons for which a patent was issued to the same inventor last year, the tubular rivet being provided with transverse openings in its sides for the cross bar, and other changes made to insure a stronger and more durable

A sash holder has been patented by Mr. William A. McDonald, of Minneapolis, Minn. It is simple in construction and action, is entirely out of sight, permits the free raising and lowering of the sash, while holding it in the desired position, is durable, and prevents the sash, door, etc., from rattling by the wind. It consists of a novel construction in that class of fasteners where a friction rell is pressed by springs.

A polishing machine has been patented by Mr. Jean Pierron, of Elizabethport, N. J. The object of this invention is to furnish an improved machine for polishing wood, stone, and other materials, and to this end there are various devices whereby the position of the abrading wheel may be adjusted and its work definitely gauged, its disk being pressed on the material by a spring, and being easily removed when worn out.

A steam heated evaporator has been patent tion of cane juice to sirup, and covers a receptacle with a surrounding chest, both of which are contained in a vat, a steam coil surrounding the chest and steam pipe connecting with it as desired, and also a pipe for condensing vapor leading from the interior receptacle.

Changeable scenery for theaters forms the subject of a patent granted to Mr. Lafayette W. Seavey, of New York city. Each separate piece or portion is mounted on rollers arranged to rest upon the stage, so that all may be revolved in either direction. To bring a set scene into any desired position tie rods are built up in sections, and suitably connected, to serve as guides for the rotation of the scenes and as ties to held the structure firmly together.

A sad iron has been patented by Mr. Alfred R. White, of Stevens Point, Wis. The ironing block or base is of approximately diamond shape, and from the center of its top projects a post, which has a spring catch for engaging a detachable handle, the latter preferably made in two parts; this handle can be adjusted in a lengthwise or crosswise position, to better adapt the iron for working on wide or narrow sur-

A fire escape has been patented by Mr. Robert Stevenson, of Ferrysburg, Mich. A balcony is devised for each floor of the building, the balustrade and floor of which fold up against the side wall under the windows, and are secured by catches, connected with a rod for releasing any one, when the floor falls on supporting brackets and the balustrade swings upright by springs, ladders being provided with the balconies to be let down by hooks.

A washing machine has been patented by Mr. Lars Christiansen, of Council Bluffs, Iowa. A suds ing vertically, with another series fixed to the sides, while a hub standing in the center has brushes on its circumference, working in combination with a vertical shaft with radial arms, so portions of the clothes may be held between the cover and arms, and other portions rubbed against the stationary brushes.

A polisher and cleaner for metal and other urfaces has been patented by Mr. William Heard, of Paterson, N. J. It is more especially designed for cleaning and polishing cutlery in kitchen use, but used as a scrubber for floors, walls, etc. There is a container, and a percolator of cork, rubber, leather, or an equivalent, the container holding the polishing material, and the percolator being adapted to distribute the same over the surface to be polished or cleaned, as the polisher is passed backward and forward over it.

An apparatus for the application of compressed air to the manufacture of glass has been patented by Messrs. Adrien A. and Leon A. Appert, of Paris, France. It may be adapted to the goblet maker's chair at present used in crystal and glass works, so the blowing can be done mechanically there for all kinds of such work, and the escape and expansion of the compressed air can be utilized for the cooling of the glass, as well as other metal or moulds, thus facilitating the manufacture and saving moulds.

A barrel finishing machine has been patented by Mr. Robert O. Dobbin, of Waterloo, Ontario, Canada. This invention, while recognizing former pa tents in the same line, provides new and special mechanism for finishing barrels after they are set up in truss hoops. There are two rotating chucks and a stationary chuck with adjustable jaws, so a barrel may be centrally compressed until the end chucks are secured when the jaws of the central chuck are radially withdrawn, and the barrel may be revolved. There are numerous special features, and while the machine can be adjusted to different sizes, one machine for each size is most economical, and all the hoops, heads, staves, etc., of one barrel will fit any other of the same kind. reducing the cost of both manufacturing and repairing.

An apparatus for the manufacture of carbon black has been patented by Mr. George G. Shoemaker, of Edenburg, Pa. This invention relates more particularly to making the black from crude petroleum and thick oilor sediment, also from the acid waste of refineries, the fuel being supplied under pressure to burners charged with ashestos or other incombustible material. Over the cup-like burners inclined cones are rotated, their apex upward, and over their upper right hand cover in line with the writer's arm, and if surfaces cold water is distributed from perforations, so the flames strike cool portions of the cones, and the lowered, to bring the surface of the page being written | fumes are condensed, while steel scrapers extend up the opposite sides of the cones and detach the carbon black formed as the cones rotate, the black descending ed by Mr. John S. Fairly, of Charleston, S. C. This into a funnel and thence into a trough or tube for re-'moval.

## NEW BOOKS AND PUBLICATIONS.

OBSERVATIONS OF THE GREAT COMET OF 1882, MADE AT THE UNITED STATES NAVAL OBSERVATORY. Prepared by William C. Winlock, Assistant Astronomer. Government Printing Office, Washington.

This appendix to regular report of 1880 is valuable s affording a complete and chronologically arranged report of observations at the National Observatory from September 19, 1882, to April 4, 1883. The comet observed was the visitor whose nucleus presented so many changes and the whole of the comet such a wide variety of forms, which are well illustrated in the exquisitely beautiful plates here given. No theories respecting comets find place in this concise record, which embraces the observations of Prof. A. Hall, Commander W. T. Sampson, Prof. J. R. Eastman, and Prof. Edgar Frisby, U.S. N., and Assistant Astronomers A. N. Skinner and William C. Winlock,

### Special.

#### REVIEW OF A GREAT AND BENEFICENT WORK.

Two recognized epochs of human life have been completed since we began this work. It is meet that we make a halt, long enough at least to take note of the region over which we have journeyed, and to examine the horizon which opens up to us.

Twice seven years ago one of us started single-handed to inaugurate and develop a new use, at once scientific and practical, professional and commercial, business-like and beneficent. They only who have tried it know the difficulties to be encountered in creating an entirely new business and securing its recognized entrance into the rank and file of business. That we have done this gives us the right to speak.

For eight years this single-handed work was prosecuted. The operator had a conviction that in the Compound Oxygen he had found a mode of redeeming his fellow-men from the sufferings of disease, more potent and benign than the world had ever seen. This inspired him with the courage to abandon a lucrative practice which he had been twelve years in building, and to overcome all obstacles in the way of realizing his dream-of proving to the world that his conviction was securely founded. That this has been fully accomplished, thousands of people—either cured or made richer in greatly improved health—stand ready to testify.

Sixteen years ago the senior partner had his attention called to a few persons who were taking the Compound Oxygen. They declared that they were improving with satisfaction. He felt sure that they were being stimulated; and that, consequently, they would soon show the effect of all stimulation, and retrograde below the point of health at which they began the treatment.

By carefully watching the cases for several months, his prediction failed of verification in a single case. He then induced several of his own patients-cases which any physician would have considered very doubtful under any system of medication—to try the effect of the Compound Oxygen. With surprise he watched them making commendable speed healthward. He then put members of his own family under treatment, and with like good results.

All this provoked a conflict in his mind. He had proof that in the Compound Oxygen there was an agent that would cure many sick ones whose condition would baffle the medical skill of any physicians whom he knew. And many others whom he might cure in six or twelvebox or tub has a series of brushes on the bottom, stand- months would get well in as many weeks nder the ac-

tion of that agent.

Now the question forced itself upon his mind and peremptorily demanded an answer: "What are you going to do with this latter class of patients, who confide to your care the restoration of their health? As a faithful phy sician, is it not your duty to take the surest and shortest way to secure to them that for which they are paying you?" Well, what is the proposition? "Evidently, send such patients where youknow they can be better served than they can be under your care and ministration."
But that would be suicidal. "No, the proportion of such
patients would be small." True, but the public will not discriminate. They will see only that the doctor sends his patients elsewhere to be cured, and. therefore, he lacks confidence in his own medical skill. "Well, there is one way out of the dilemma; get possession of the superior curative agent, and thus make peace with your professional conscience and prove yourself a friend to suffering humanity." What, and be jeered by one's suffering humanity." What, and be jeered by one's friends, and tabooed by one's professional brethren! "That appears to be about the price. But what is the alternative?" Result: He gives up his hard-earned practice, secures at a great price the knowledge of and the right to administer the Compound Oxygen in this city. Thisincluded only the Office Treatment in Philadel-

phia. Soon he was exercised by the fact that the opera-tion of an office business was very limited. Something must be done to dispense the blessing far and wide. Accordingly, at no little expense, he hastened to make known to his professional brethren the virtues of Compound Oxygen, and to furnish them with outfits for administering it. As he ought to have known would be the ease, his efforts excited ridicule and reproaches.

Nothing daunted, he entered upon a long series of ex-periments, which resulted in the conviction that there was a much better method of accomplishing the end in view than the one which had failed. Hence the widely known Home Treatment.

In this untried field he labored for a year; meeting many failures in his experiments, working hard at details, and creating a literature which the work absolutely required. On the last of June, ten years ago, the practicability of the enterprise was demonstrated. But he had exhausted his resources, broken his health, and almost sacrificed his life. The ship was bilt and launched, but three years' struggle proved to him that he could not freight and man it. Six and a half years agohefound a man who could appreciate the value of the work in hand. Our united forces have fulfilled the brightest hopes of the pioneer.

A new departure was the order of the day. The first and essential thing to be done was, to let those who needed our curative agent know that we were in possession of it. Knowing that many fortunes have be in advertising, we decided to put that part of the bustness into the hands of one whose skill and experience had been proven. It is enough to say that the methods which he adopted have revolutionized important branch

es of advertising.
From the outset we have dealt truthfully ith the suffering sick, realizing that they at least had a right to demand such dealing. We knew that we had a curative agent superior to any other in the world, and therefore the simple truth about it would be the best credentials it could have; hence we were not tempted to invent testimonials, nor to steal genuine ones, nor to romance on

The growth of the business has been phenomenal. During the first year the business. doubled each month. During the lastfour years we have recorded in our books statements of diseases, reports of progress, repeated advice and prescriptions, of over twenty thousand persons. Much more could be said in proof of the success of our work as commercial enterprise; but let this suffice. It is of much greater importance to prove that our

professional success has exceeded the other.

What have we to show in this direction? During those fourteen years we have treated thirty thousand patients. Among these a large proportion had been sick for years. Theyhad exhausted the skill of the best physicians of all schools, different sanitariums, various natural health resorts, shops of nostrum-mongers, and months of hygienic traveling. In many of these cases it has cost more to remove the baleful effects of the treatment practiced on them, than those of the original disease. How many of them have been desperate cases may be inferred from the fact that we have filled scores of orders—sent unconditionally-in which the patient had passed beyond the reach of any remedy on its arrival. And out of this unpromising multitude, ninety per cent. have been either cured or greatly benefited.

We have proved that a number of diseases which by common consent have been assigned to the category of "incurables," no longer belong there. We have cured a number of cases of Bright's disease. Two of these cases were brothers whose father, one brother, and one sister had died of the same disease. We have treated four cases of Locomotor ataxia, or progressive paralysis. In all of these the progress of the disease has been arrested (which no system of medication has ever been known to do), and the patients have made genuine progress toward health. We almost never fail to cure asthma-even o fifteen years' standing-unless the case has been spoiled by the use of narcotics, which served as palliatives but constantly aggravated the disease. The same can be said of that "opprobrium medendi," hay fever. The cases of consumption-confirmed phthisis—which the Compound Oxygenhas cured can be counted by scores. We are confident that we make more genuine cures of catarrh-nasal, laryngeal, bronchial, and pulmonary-than all the catarrh specialists in the country.

A distinguished member of the New York Bar, who appeared to be a wreck both physically and mentally, and who had settled up his worldly affairs, resumed his active business after three months' treatment; and this business be has successfully followed for a year. Mrs. Mary A. Livermore, who had been disabled for nearly two years by a dangerous exhaustion of the brain, has for a year and a half been prosecuting her professional work with more ease and energy than ever before. The Hon. W. D. Kelley, the Father of the National House of Representatives, will tell any one that he owes the last ten years of his life to Compound Oxygen; and it can hardly be disputed that during this period his labors have not been surpassed by those of any other member of Congress. William Penn Nixon, of the Chicago Inter-Ocean, says that he owes his life and some years of active usefulness to the virtues of Compound Oxygen. The public know very well the unqualified testimony which Mr. T. S. Arthur has borne in favor of the Compound Oxygen as exhibited in his own case.

But why multiply examples? We have published many hundred statements in the patients' own language of the effects of Compound Oxygen in almost every kind of disease.

Now what of the future? Having accomplished what we have, and against such odds, our progress henceforward should be broader, more successful, and more beneficent. As was to have been expected, proprietors of sanitariums and health resorts, whose business has been diverted from them by the popularity of the Compound Oxygen, try to show that our agent is inert. But until they can rationally account for the thousands of wonderful cures effected by it, their tirades are in vain. Of course there are—and there will probably be more-imitators of the Compound Oxygen. Some have already stolen our title, our literature, and even our testimonials. One of them, having obtained from William Penn Nixon an opinion of Compound Oxygen in his own case, now publishes it as though Mr. Nixon was cured by his treatment instead of ours! Some of those agents may be innocuous; but we have a good reason to believe that many of them are positively injurious.

They will have their day.

But despite all factious opposition Compound Oxygen must become increasingly popular, so long as it esses the ability to effect such remarkable cures a now attest its merit.

For full information regarding the treatment and it use, address 1109 and 1111 Girard St., Philadelphia.

# Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office asearly as Thursday morning to appear in next issue.

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Wanted .- Superintendent for agricultural implement factory near New York. Must understand machine shop, wood shop, foundry, blacksmithing, etc., accord-Address, stating experience, expectations, etc., ' and Iron," care of William Young, 21 Park Row, N.Y.

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If an invention has not been patented in the United States for more than one year, it may still be patented in Canada. Cost for Canadian patent, \$40. Various other foreign patents may also be obtained. For instructions address Munn & Co., SCIENTIFIC AMERICAN Patent Agency, 261 Broadway, New York.

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Water purified for all purposes, from household supplies to those of largest cities, by the improved filters manufactured by the Newark Filtering Co., 177 Commerce St., Newark, N. J.

Split Pulleys at low prices, and of same strength and on the small shaft will be about four times as great

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HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then pubing to modern customs, and be a man of proved ability. lished, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the Scientific American Supple-MENT referred to in these columns may be had at the

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or

(1) C. M. asks: In what proportion of bulk atmospheric air is reduced by compression into 2, 3, 4, "How to Keep Boilers Clean." Book sent free by etc., atmospheres? I mean, for instance, what room will 1 cubic foot of air occupy after having been com-Iron Planer, Lathe, Drill, and other machine tools of pressed to 2, 3, 4, etc., atmospheres, showing a pressure modern design. New Haven Mfg. Co., New Haven, Conn. of 45, 60, 75, 90, etc., 1b. respectively? A. The pressure resulting from the compression of atmospheric air in volumes after cooling to the normal temperature isvolumes compressed into one-

4 vol. 6 vol. 45 lb. 30 lb. **6**0 lb. 90 lb.

At the instant of compression the pressure arising from the liberation of the latent heat carries the pressure somewhat higher.

(2) H. M. B.—We should infer from the description that the substance was some sort of slag having a melting point lower than the heat to which the bricks were exposed. It is probably a silicate of lime or iron. To positively determine its nature an analysis would be necessary, the expense of which would be from \$10 to \$20, and a larger quantity of the coating would be required.

(3) J. L. T. writes that hammering and heating are two essentials to insure a good mill pick. Never strike a pick or any steel tool on edge where the red heat has left it; let all the hammering be on the flat surface, and the last blows right along the point of the tool to bring the steel close where the greatest resistance to the blow is required. Clean, cold, soft water 

(4) F. W. M. writes: 1. Suppose I have gear wheel with a loose journal-bearing surface 2 is in width, revolving on a shaft 11/2 inches in diamete and another loose gear wheel just like the first, on that the width of its journal-bearing surface is half a inch, and it revolves on a shaft 6 inches in diameter Will the bearing surface in both cases be the sam viz., 9.4248 + sq. in.? A. The bearing surface will the same, 9.4248 + sq. in. 2. Now suppose the who on the 6 in. shaft is to be revolved only one-fourth fast as the wheel on the 11/2 in. shaft, would the friction Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J. and wear be same in each? A. The friction and wear appearance as Whole Pulleys. Yocom & Son's Shafting on the larger. The contact surfaces in both instanc Works. Drinker St., Philadelphia, Pa. are the same, but in the former case the same particles. are the same, but in the former case the same particle Supplement Catalogue.-Persons in pursuit of infor. are brought in contact with one another four time weight upon both shafts is assumed to be the same the wear must be four times as rapid in the or instance as in the other. 3. Would it require any mo power to operate one than the other? I have been thinking that under the above circumstances the whe with the large shaft would suffer no more wear or fr the smaller shaft. But if they were both to make revolution in the same time, the former would wear fo Straight Line Engine Co. Syracuse, N. Y. Best in times as fast and take four times the power. A. It impossible to answer the question of power positivel as the conditions are not fully enough given. V should say, however, that the power required to fulfi above conditions will be about the same for both shafts although theoretically a little more power will be r quired to overcome greater wear of smaller shaft.

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Alarm. See Lamp alarm.  Bag holder, M. Hayman	Furnace grate, M. C. Jones. 292, Furnace Joint. E. C. Condit 292, Furnaces, device for indicating the temperature in annealing, M. A. Lhuissier 292, Furnaces, manufacture of non-calcareous linings for metallurgical, J. Keese. 293, Gage. See Liquid or water gage. Sawyer's gage. Gage, J. H. Fenety. 292, Game apparatus, G. A. Lilliendahl. 293, Game apparatus, G. A. Lilliendahl. 293, Gas and water regulator, A. E. Cohn 292, Gas, apparatus for producing, G. W. Billings. 293, Gas scrubber, C. W. Isbell 292, Gas burner. J. G. Sanderson 292, Gas sorubber, C. W. Isbell 292, Glass, apparatus for the application of compressed air to the manufacture of, A. A. & L. A. Appert. 292, Glass articles snap for holding, H. C. Schrader. 292, Glassware, manufacture of ornamental, W. F. Russell 292, Glassware, manufacture of spangled, W. Leighton, Jr. 292, Gold by means of alkaline sulphides, extracting, C. P. Williams. 292, Governor, centrifugal, J. Selwig. 292, Grinding mill, F. Wilson. 292, Grinding mill, F. Wilson. 292, Grinding mill, F. Wilson. 292, Hammer die, J. Withington. 292, Hammer die, J. Withington. 292, Hat bodies, apparatus for stretching, J. Eaton. 292, Hat bodies, machine for feiting and sizing, J. J. Perine. 292, Hat linings, manufacture of, A. Solmans. 292, Hat protector. C. A. Helbig. 292, Hat prake, horse, J. N. & T. Wallis. 292, Hay rake, horse, J. N. & T. Wallis. 292, Heat and fire resisting valve, W. A. Goodyear. 292, Heet burnishing tool, A. E. Stirckler. 292, Heel burnishing tool, A. E. Stirckler. 292, Heel burnishing tool, A. E. Stirckler. 292,	2,492 2,587 2,497 2,508 2,551 2,568 2,769 2,536 2,730 2,730 2,730 2,730 2,730 2,768 2,682 2,765 2,662 2,663 2,662 2,662 2,663 2,662 2,663 2,662 2,663
Alarm. See Lamp alarm.  Bag holder, M. Hayman	Furnace grate, M. C. Jones. 292, Furnace joint. E. C. Condit. 292, Furnaces, device for indicating the temperature in annealing, M. A. Lhuissier 292, Furnaces, manufacture of non-calcareous linings for metallurgical, J. Keese. 292, Gage. See Liquid or water gage. Sawyer's gage. Gage, J. H. Fenety. 292, Game apparatus, G. A. Lilliendahl. 293, Game apparatus, G. A. Lilliendahl. 293, Gas and water regulator, A. E. Cohn 292, Gas and water regulator, A. E. Cohn 293, Gas scrubber, C. W. Isbell 292, Gas burner. J. G. Sanderson 292, Gas scrubber, C. W. Isbell 292, Glass, apparatus for producing, G. W. Billings 292, Glass, apparatus for the application of compressed air to the manufacture of, A. A. & L. A. Appert. 292, Glassware, manufacture of ornamental, W. F. Russell 292, Glassware, manufacture of spangled, W. Leighton, Jr. 292, Gold by means of alkaline sulphides, extracting, C. P. Williams 292, Grain, etc., separator for, F. L. Kidder. 292, Grinding mill, J. Q. Adams. 292, Grinding mill, F. Wilson. 292, Grinding mill, F. Wilson. 292, Hammer die, J. Withington. 292, Harless, S. Funk. 292, Hat bodies, machine for felting and sizing, J. J. Perine. 292, Hat bodies, machine for felting and sizing, J. J. Perine. 292, Hat linings, manufacture of, A. Solmans. 292, Hat prake, horse, J. N. & T. Wallis. 292, Hay rake, horse, J. N. & T. Wallis. 292, Hay rake, horse, J. N. & T. Wallis. 292, Hay rake, horse, J. N. & T. Wallis. 292, Heel trimmer, C. S. Dwyer. 292, Heel trimmer, C. S. Dwyer. 292, Heid souring and fleshing apparatus, A. Whiting, 292, Heel trimmer, C. S. Dwyer. 292, Heid souring and fleshing apparatus, A. Whiting, 292, Heid souring and fleshing apparatus, A. Whiting, 292,	2,492 2,587 2,497 2,508 2,551 2,568 2,769 2,462 2,462 2,766 2,462 2,766 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,686 2,685 2,686
Alarm. See Lamp alarm.  Bag holder, M. Hayman	Furnace grate, M. C. Jones. 292, Furnace joint. E. C. Condit. 292, Furnaces, device for indicating the temperature in annealing, M. A. Lhuissier 292, Furnaces, manufacture of non-calcareous linings for metallurgical, J. Keese. 292, Gage. See Liquid or water gage. Sawyer's gage. Gage, J. H. Fenety. 292, Game apparatus, G. A. Lilliendahl. 293, Game apparatus, G. A. Lilliendahl. 293, Gas and water regulator, A. E. Cohn 292, Gas, apparatus for producing, G. W. Billings. 292, Gas scrubber, C. W. Isbell 293, Gas scrubber, C. W. Isbell 293, Glass, apparatus for the application of compressed air to the manufacture of, A. A. & L. A. Appert. 292, Glassware, manufacture of ornamental, W. F. Russell 292, Glassware, manufacture of ornamental, W. F. Russell 292, Glassware, manufacture of spangled, W. Leighton, Jr. 292, Governor, centrifugal, J. Selwig. 292, Grinding mill, J. Q. Adams. 292, Grinding mill, F. Wilson. 292, Grinding mill, F. Wilson. 292, Grinding mill, F. Wilson. 292, Hammer die, J. Withington. 292, Harness loop, J. M. Basinger. 292, Hat bodies, machine for felting and sizing, J. J. Perine. 292, Hat linings, manufacture of, A. Solmans. 292, Hat prake, horse, J. N. & T. Walliss. 292, Hat sizing or felting machine, J. J. Perine. 292, Hay rake, horse, J. N. & T. Walliss. 292, Hay rake, horse, J. N. & T. Walliss. 292, Hay rake, horse, J. N. & T. Walliss. 292, Heel trimmer, C. S. Dwyer. 292, Hitching bor, horse, F. Taylor. 292, Hitching loop and strap, safety, R. W. Jones. 294, Hitching loop and strap, safety, R. W. Jones. 292, Hitching loop and strap, safety, R. W. Jones. 292, Hitching loop and strap, safety, R. W. Jones. 292,	2,492 2,587 2,497 2,508 2,556 2,709 2,536 2,632 2,730 2,632 2,765 2,632 2,662 2,676 2,685 2,662 2,676 2,685 2,662 2,676 2,685 2,684 2,586 2,584 2,586
Alarm. See Lamp alarm.  Bag holder, M. Hayman	Furnace grate, M. C. Jones. 292, Furnace Joint. E. C. Condit 292, Furnaces, device for indicating the temperature in annealing, M. A. Lhuissier 292, Furnaces, manufacture of non-calcareous linings for metallurgical, J. Keese. 293, Gage. See Liquid or water gage. Sawyer's gage. Gage, J. H. Fenety. 292, Game apparatus, G. A. Lilliendahl. 292, Game apparatus, G. A. Lilliendahl. 293, Gas, apparatus for producing, G. W. Billings. 293, Gas, apparatus for producing, G. W. Billings. 293, Gas scrubber, C. W. Isbell. 292, Glass articles snap for holding, H. C. Schrader. 292, Glass articles snap for holding, H. C. Schrader. 292, Glass articles snap for holding, H. C. Schrader. 292, Glassware, manufacture of ornamental, W. F. Russell. 293, Glassware, manufacture of spangled, W. Leighton, Jr. 292, Governor, centrifugal, J. Selwig. 292, Grain, etc., separator for, F. L. Kidder. 292, Grinding mill, J. Q. Adams. 292, Grinding mill, W. E. Gorton. 292, Grinding mill, W. E. Gorton. 292, Hammer die, J. Withington. 292, Hammer die, J. Withington. 292, Hat bodies, apparatus for stretching, J. Eaton. 292, Hat bodies, manufacture of, A. Solmans. 292, Hat sizing or felting machine, J. J. Perine. 292, Hat sizing or felting machine, J. J. Perine. 292, Hat rake, horse, J. N. & T. Wallis. 292, Hay rake, horse, S. F. Weaver. 292, Heel burnishing tool, A. E. Stirckler. 292, Hide scouring and fleshing apparatus, A. Whiting. 394, Hinge, W. Patterson. 292, Hitching bar, horse, F. Taylor. 292, Hitching bar, horse, F. Taylor. 292,	2,492 2,587 2,497 2,508 2,551 2,568 2,709 2,536 2,682 2,765 2,682 2,765 2,685 2,765 2,662 2,662 2,663 2,662 2,663 2,662 2,663 2,663 2,564
Alarm. See Lamp alarm.  Bag holder, M. Hayman	Furnace grate, M. C. Jones. 292, Furnace joint. E. C. Condit. 292, Furnaces, device for indicating the temperature in annealing, M. A. Lhuissier 292, Furnaces, manufacture of non-calcareous linings for metallurgical, J. Keese. 292, Gage. See Liquid or water gage. Sawyer's gage. Gage, J. H. Fenety. 292, Game apparatus, G. A. Lilliendahl. 293, Game, checker and base ball combination, H. S. Towner. 292, Gas and water regulator, A. E. Cohn 293, Gas, apparatus for producing, G. W. Billings. 292, Gas scrubber, C. W. Isbell 293, Gas scrubber, C. W. Isbell 293, Glass, apparatus for the application of compressed air to the manufacture of, A. A. & L. A. Appert. 292, Glass articles snap for holding, H. C. Schrader. 292, Glassware, manufacture of ornamental, W. F. Russell 293, Glassware, manufacture of spangled, W. Leighton, Jr. 292, Governor, centrifugal, J. Selwig. 292, Grain, etc., separator for, F. L. Kidder. 292, Grinding mill, J. Q. Adams. 292, Grinding mill, F. Wilson. 292, Hammer die, J. Withington. 292, Hammer die, J. Withington. 292, Hat bodies, machine for felting and sizing, J. J. Perine. 292, Hat bodies, machine for felting and sizing, J. J. Perine. 292, Hat protector C. A. Helbig. 292, Hat prake, horse, J. N. & T. Wallis. 292, Hay rake, horse, J. N. & T. Wallis. 292, Hay rake, horse, S. F. Weaver. 292, Hat prake, horse, J. N. & T. Wallis. 292, Hay rake, horse, S. F. Weaver. 292, Heel trimmer, C. S. Dwyer. 292, Hide scouring and fleshing apparatus, A. Whiting. 294, Hell trimmer, C. S. Dwyer. 292, Hide scouring and fleshing apparatus, A. Whiting. 292, Holder. See Bag holder. Broom holder. 292, Insulated conductor of electricity, W. A. Shaw. 292, Insulated conductor of electricity, W. A. Shaw. 292,	2,492 2,587 2,497 2,508 2,551 2,568 2,709 2,562 2,766 2,622 2,766 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,742 2,686 2,742 2,686 2,742 2,746 2,742 2,746 2,742 2,746 2,742 2,746 2,742 2,746 2,742 2,746 2,742 2,746
Alarm. See Lamp alarm.  Bag holder, M. Hayman	Furnace grate, M. C. Jones. 292, Furnace joint. E. C. Condit. 292, Furnaces, device for indicating the temperature in annealing, M. A. Lhuissier 292, Furnaces, manufacture of non-calcareous linings for metallurgical, J. Keese. 292, Gage. See Liquid or water gage. Sawyer's gage. Gage, J. H. Fenety. 292, Game apparatus, G. A. Lilliendahl. 293, Game apparatus, G. A. Lilliendahl. 293, Gas et al. 292, Gas and water regulator, A. E. Cohn 292, Gas and water regulator, A. E. Cohn 292, Gas apparatus for producing, G. W. Billings. 292, Gas burner. J. G. Sanderson. 292, Gas scrubber, C. W. Isbell 292, Glass, apparatus for the application of compressed air to the manufacture of, A. A. & L. A. Appert. 292, Glass articles snap for holding, H. C. Schrader. 292, Glassware, manufacture of ornamental, W. F. Russell 292, Glassware, manufacture of spangled, W. Leighton, Jr. 292, Glowernor, centrifugal, J. Selwig. 292, Grinding mill, J. Q. Adams. 292, Grinding mill, W. E. Gorton. 292, Grinding mill, F. Wilson. 292, Grinding mill, F. Wilson. 292, Grinding mill, F. Wilson. 292, Handle. See Tool handle. 192, Handle. See Tool handle. 192, Hat bodies, machine for felting and sizing, J. Perine. 292, Hat bodies, machine for felting and sizing, J. Perine. 292, Hat sizing or felting machine, J. J. Perine. 292, Hat rack, horse, J. N. & T. Wallis. 292, Hay rake, horse, S. F. Weaver. 292, Hat sizing or felting machine, J. J. Perine. 292, Hay rake, horse, S. F. Weaver. 292, Hat sizing or felting machine, J. J. Perine. 292, Hay rake, horse, J. N. & T. Wallis. 292, Hay rake, horse, J. N. & T. Wallis. 292, Hat sizing or felting machine, J. J. Perine. 292, Hay rake, horse, J. N. & T. Wallis. 292, Hat sizing or felting machine, J. J. Perine. 292, Hat rack horse, J. N. & T. Wallis. 292, Hat sizing or felting machine, J. J. Perine. 292, Heel trimmer, C. S. Dwyer. 292, Heel trimmer, C. S. Dwyer. 292, Heel trimmer, C. S. Dwyer. 292, Hitching bon and strap, safety. R. W. Jones. 292, Lice creeper, J. Reist. 292, Insulated conductor of electricity, W. A. S	2,492 2,587 2,497 2,508 2,551 2,568 2,709 2,562 2,766 2,622 2,766 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,742 2,686 2,742 2,686 2,742 2,746 2,742 2,746 2,742 2,746 2,742 2,746 2,742 2,746 2,742 2,746 2,742 2,746
Alarm. See Lamp alarm.  Bag holder, M. Hayman	Furnace grate, M. C. Jones. 292, Furnace joint. E. C. Condit. 292, Furnaces, device for indicating the temperature in annealing, M. A. Lhuissier 292, Furnaces, manufacture of non-calcareous linings for metallurgical, J. Keese. 292, Gage. See Liquid or water gage. Sawyer's gage. Gage, J. H. Fenety. 292, Game apparatus, G. A. Lilliendahl. 293, Game apparatus, G. A. Lilliendahl. 293, Gas and water regulator, A. E. Cohn 292, Gas and water regulator, A. E. Cohn 292, Gas scrubber, C. W. Isbell 292, Gas burner. J. G. Sanderson 292, Gas scrubber, C. W. Isbell 292, Glass, apparatus for producing, G. W. Billings 292, Glass articles snap for holding, H. C. Schrader. 292, Glass articles snap for holding, H. C. Schrader. 292, Glassware, manufacture of ornamental, W. F. Russell 292, Glassware, manufacture of spangled, W. Leighton, Jr. 292, God by means of alkaline sulphides, extracting, C. P. Williams. 292, Grinding mill, J. Q. Adams. 292, Grinding mill, W. E. Gorton. 292, Grinding mill, F. Wilson. 292, Grinding mill, F. Wilson. 292, Handle. See Tool handle. Harness, S. Funk. 292, Hat bodies, machine for felting and sizing, J. J. Perine. 292, Hat bodies, machine for felting and sizing, J. J. Perine. 292, Hat bodies, machine for felting and sizing, J. J. Perine. 292, Hat sizing or felting machine, J. J. Perine. 292, Hat rake, horse, J. N. & T. Wallis. 292, Hat rake, horse, J. N. & T. Wallis. 292, Hat rake, horse, J. N. & T. Wallis. 292, Hat rake, horse, J. N. & T. Wallis. 292, Hat rake, horse, J. N. & T. Wallis. 292, Hat rake, horse, J. N. & T. Wallis. 292, Heel trimmer, C. S. Dwyer. 292, Hitching loop and strap, safety, R. W. Jones. 292, Heel trimmer, C. S. Dwyer. 292, Hitching loop and strap, safety, R. W. Jones. 292, Heel trimmer, C. S. Dwyer. 292, Hitching loop and strap, safety, R. W. Jones. 292, Heel trimmer, C. S. Dwyer. 292, Heel trimmer, C. S. Dwyer. 292, Hitching loop and strap, safety, R. W. Jones. 292, How and the papar	2,492 2,587 2,587 2,568 2,769 2,568 2,769 2,685 2,765 2,685 2,765 2,685
Alarm. See Lamp alarm.  Bag holder, M. Hayman	Furnace grate, M. C. Jones	2,492 2,587 2,497 2,508 2,551 2,568 2,709 2,568 2,766 2,685 2,685 2,685 2,685 2,685 2,686 2,786 2,686 2,786 2,686 2,786
Alarm. See Lamp alarm.  Bag holder, M. Hayman	Furnace grate, M. C. Jones	2,492 2,587 2,497 2,508 2,551 2,568 2,709 2,568 2,766 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,685 2,686
Alarm. See Lamp alarm.  Bag holder, M. Hayman	Furnace grate, M. C. Jones	2,492 2,587 2,497 2,508 2,556 2,568 2,769 2,685