these are not published is perhaps a matter of surprise to our correspondents. We are always glad to publish anything that we consider suggestive, or likely to lead to useful research. Many communications, although they may contain entirely erroneous statements and false reasoning, are noticed because they afford an opportunity for the imparting of useful information, or the correction of popular errors. Our readers would be surprised, were we to merely give the titles of some of the communications we receive. Here is a correspondent who writes us upon the duality of sex in the human brain; another who thinks there is a relation between the phenomena of thought and the planets Venus and Mercury; still another who most dogmatically states that he has without experiment, by pure reasoning, discovered the relation of matter in its ultimate condition, and wishes us to occupy four columns of space with his ideas upon the subject. In striking contrast with these is one from a school-boy, asking for information upon a subject which shows that he is inquisitive in the right direction, and couched in language which gives evidence of improved opportunities, and large promise for the future. Welcome, my lad! Your inquiry shall receive attention in due time, while other more pretentious, but far less valuable correspondence, finds its way into the waste-basket.

COPPERED IRON ROLLERS FOR CALICO PRINTING.

The last number of the London *Mechanics' Magazine* says, that to save a portion of the large amount of capital invested in copper printing rollers by calico manufacturers which lies necessarily idle, "the Swiss printers have been experimenting," and with complete success, with iron rollers coated with copper of sufficient thickness to allow of the pattern being engraved upon it. The mode of coating adopted by the Swiss is said to be a secret; but there are several plans by which a thin layer of copper can be obtained upon which as much metal as may be wished can be thrown down by the ordinary electrotype process. We have published several modes of coppering iron already, and add one more devised by Weiskopf. He first brushes the object (say roller) over with a solution made by dissolving one part of nitrate of copper in fifty parts of hydrochloric acid; and afterward with a second solution of ten parts nitrate of copper, ten parts chloride of copper, and eighty parts hydrochloric acid. This latter solution is applied very quickly with a soft brush The copper is deposited in a few seconds, and the object must be rinsed immediately in cold water and wiped with a soft cloth. By repeating the application of this second solution the copper coating may be obtained of any desired thickness. This process, the author says, is to be recommended for its simplicity, cheapness, and the durability of the copper layer. Our own experience with the coating of copper with acid solutions similar to this has shown us that unless the application be made very quickly indeed, the copper does not adhere firmly to the iron and is apt to blister and peel off. For coating rollers, therefore, we should recommend an alkaline process—either Weil's or the old cyanide plan. When the pattern is out of date, the Swiss convert the old roller into a new one by covering all parts of the roller except the engraved pattern, with an insulating varnish, then immersing it in a bath, to fill up the pattern with freshly deposited copper. The roller is then ready to have a new pattern engraved upon it."

We can scarcely reconcile the two statements in the above extract that the Swiss process is a "secret," and that they "immerse the roller in a bath" to fill up, by deposition, the depressions of the engraving. We have, also, very little faith in coating iron rollers with copper for calico printing by the electrotype process. Several plans for coating iron with copper by deposition have been proposed, but we have yet to know of any that have been entirely successful—that is, have produced a perfect homogeneous and solid coating It is almost impossible to make the surface of the iron so chemically clean and to so free it from all minute irregularities that the copper will combine with it and secure a perfect copper covered surface. The colors used in printing frequently contain acids, and if the slightest pin hole exists in the copper covering these acids would certainly affect the colors by the oxidation of the iron, and tend to undermine the copper.

The rollers used in calico printing are hollow, to receive a mandrel, but are composed entirely of copper. When the pattern engraved on a set of rollers has been used sufficiently, the roller is turned in a lathe to remove the engraving, and then ground and polished. Thus the roller may be used for a large number of patterns, being re-engraved and turned until the shell becomes too thin. The worn out roller and the turnings are worth nearly if not quite as much as pig copper to be wrought over again.

We have often thought that iron rollers might be substituted for those made entirely of copper, having a casing of copper—not, however, deposited by the battery—but a sheath or hollow cylinder of copper might be forced upon the iron core by hydraulic pressure and made of sufficient thickness to be engraved and used for printing a number of times. This would seem to be more reasonable than the plan proposed by the *Mechanics' Magazine*, as it would be certain to secure solid metal for the reception of the engraving.

THE QUALITY OF ILLUMINATING GAS.

In looking over our exchanges we notice frequent complaints in regard to the poor quality of illuminating gas furnished by the different gas manufacturing companies These complaints are not confined to particular cities, but seem to be nearly universal. Some seem to cling, however, to the idea that it is not the quality of the gas that is at fault, but the meters. In an article entitled "Gas Measurement," published on page 337, Vol. XVIII. of the SCIENTIFIC AMERICAN, we showed that the meters were unjustly blamed for the want of uniformity in the expense of illumination through corresponding portions of the year, and that the real fault was to be referred to the inferior quality of gas furnished by the manufacturers.

It is not unfrequently the case that the standard of quality is allowed to sink so low that three feet of gas give no better illumination than two feet of the proper quality ought to give. The three feet of poor gas cost the producers but little more than two feet of good gas, and the companies add largely to their dividends by the fraud. When the murmurings of the public begin to be troublesome and seem to threaten opposition, up goes the standard, and the clamor subsides for a season.

It is high time that a remedy for such wholesale imposition should be prescribed. The standard of quality should be fixed by law, in lieu of anything better; but we are confident that our suggestion contained in the article above referred to would be a much better check than any legislation upon the subject could be. The suggestion referred to was the invention of a meter that should register for quality as well as quantity. The idea seems to us perfectly practicable, and the man who can invent a cheap and accurate apparatus by which the daily quality of gas, as well as its average quality for a given time, can be registered, would find a buyer in nearly every consumer of gas. With such tell-tales in every house, gas companies could not practice the irregularities hitherto complained of. People would know what they were buying and would be on an equal footing with the monopolists, who, not content with legitimate profits, seek to swell their gains by depreciating the quality of their products.

We know of no more promising field for inventive genius than this, and we are confident a rich reward awaits the inventor that shall succeed in supplying this growing want in all gas-consuming towns.

OFFICIAL EXAMINATION OF APPLICATIONS FOR PATENTS.

Applications for patents are distributed into thirty-six different classes under the following classifications:

I. AGRICULTURE. II. AGRICULTURAL PRODUCTS (Preparation of). III. BUILDERS' HARDWARE. IV. CALORIFICS. V. CARRIAGES. VI. CHEMICAL PROCESSES. VII. CIVIL ENGINEERING. VIII. CLAY MANUFACTURES. IX. COMPOSITIONS. X. FELTING AND HAT MAKING. XI. FINE ARTS. XII. FIRE-ARMS. XIII. GLASS MANUFACTURE. XIV. GRINDING MILLS. XV. HARVESTERS. XVI. HOUSEHOLD FURNITURE. XVII. HYDRAULICS AND PNEUMATICS. XVIII. ILLUMINATION. XIX. LEATHER MANUFACTURES. XX. MECHANICAL ENGINEERING. XXI. METALLURGY. XXII. METAL WORKING. XXIII. NAVIGATION. XXIV. PAPER MAKING. XXV. PHILOSOPHICAL INSTRUMENTS. XXVI. PRESSES. XXVII. PRINTING AND STATIONERY. XXVIII. RAILROADS AND CARS. XXIX. SEWING MACHINES XXX. SPORTS, GAMES. AND TOYS. XXXI. STEAM AND AIR ENGINES. XXXII STONE WORKING. XXXIII. SURGICAL APPARATUS. XXXIV. TEXTILE MANUFACTURES. XXXV. WEARING APPAREL. XXXVI. WOOD WORKING.

These classes are distributed to twenty principal examiners, and their assistants, and each class embraces a variety of subjects, as for example class thirty-six, devoted to "Wood-Working," contains nearly 500 modifications of machines and implements applied to that branch of industry. Now when an application for a patent is filed it goes to the class or subdivision to which it belongs, and is examined when that comes up, and not upon the plan adopted by the miller who grinds out his grist in regular rotation.

It would not be possible for an examiner to get through with his cases properly unless he should take up and dispose of all that relate to the same subject on his file. This explantion will enable applicants for patents to understand why some cases remain longer than others in the Patent Office.

PATENT OFFICE MATTERS.

Commissioner Foote has appointed James S. Grinnell chief clerk, in place of A M. Stout, resigned Mr. Grinnell was for several years chief clerk in the Agricultural Department, but more recently Examiner in charge of the class of Lumber in the Patent Office. He is a gentleman well qualified to perform the duties of the office, and his appointment, we are sure, will give satisfaction to inventors, and all others who have occasion to do business with the Patent Office. General W. H. Browne, of this city, has been appointed a First Assistant Examiner and assigned to duty with General Schoepf in the classes of Land Conveyance and Mechanical Engineering. Horace Binney, of Philadelphia, Pa., has also been appointed a First Assistant, and Emmett Quinn a Second Assistant Examiner.

The Commissioner, in order to reduce the expenses of the office, has notified a number of those engaged in the model rooms that their services will not be required after the 1st proximo; and there will also, we understand, be a reduction of the clerical force in the draftsmen's and other rooms, after that date.

Perpetual Motion.

An exhibition of a "Perpetual Motion" machine is now going on at Wilkesbarre, Pa., which seems to astonish the natives, if we may judge from the laudatory editorials of some of the papers in that region. One of our Wilkesbarre cotemporaries says:

"We are free to confess that we were disappointed in point of mechanism; it is one of the finest pieces of mechanism that we ever saw, and in a scientific point of view it is a puzzler, and worthy a visit from every mechanic and every philosopher, and we are satisfied that all will be pleased as well as astonished. To describe this wonder of the nineteenth century is a task, and beyond the possibility of description, and must be seen to be understood.

"The power is derived from four brass balls weighing each four and one half ounces, operating upon a combination of levers so combined as to give the long end of each in favor of the power, and while the ball on one end is passing down by its own gravity through an arc of 90°, the other end of the lever, loaded with a ball of the same weight, is being carried up through an arc of 95°, the difference between the arcs being occasioned by the inclination of the planes by which the balls are conveyed from one end of the levers to the other. This excess of distance through which the balls pass on the end of resistance seems to be easily overcome by the third lever, which is attached to the second in such a way that it describes a greater arc than is described on the descending end, which seems a contradiction in mechanics, and yet it is so, and at the same time retaining the balance of power in favor of the end of power.

"While the ball in its descent is twelve inches from the fulcrum, the point of resistance is but one; it is therefore certain that whatever weight the descending ball may have, multiplied by the difference between the point of power and point of resistance, would give the potential power of the machine; and it is manifest that a ball of four-and-a-half ounces will exert an influence equal to fifty-six ounces on the machine. Wonderful as this may seem, yet it must be so

"To describe this beautiful piece of mechanism, is out of the question, and the more we say seems only the more to bother the mind; we, therefore, advise those who are interested, if an opportunity offers, to go and see it and solve the problem for themselves. The man who ventures a negative opinion on any question in this nineteenth century, stands on slippery ground. We prefer to see rather than denounce."

Genius is capable of wonderful things to be sure, and no man can fix its limits But the most ingenious machines, if they operate at all, must move in accordance with natural laws. The phenomenon which astonishes our editorial friend is that of a 4½ ounce ball going down hill and at the same time drawing up the hill a weight of 56 ounces. This apparent contradiction has bothered his mind out of its common sense.

The Berks County self-motor is nothing but a piece of mechanical legerdemain, deriving its motion from a concealed source, probably a clock work or an electro-magnet. Such "perpetual motions" are very old.

An engraving of a machine answering somewhat to the description of the "Berks," was published and explained some years ago in the SCIENTIFIC AMERICAN.

Trial Trip of the First Locomotive.

Major Horatio Allen, the engineer of the New York and Erie Railroad, gives the following account of the first trip made by a locomotive on this continent:

"When was it? Who was it? And who awakened its energies and directed its movements? It was in the year 1828, on the banks of the Lackawaxen, at the commencement of the railroads connecting the canal of the Delaware and Hudson Canal Company with their coal mines—and he who addresses you was the only person on that locomotive. The circumstances which led to my being alone on the road were these: The road had been built in the summer; the structure was of hemlock timber, and rails of large dimensions notched on caps placed far apart. The timber had cracked and warped from exposure to the sun. After about three hundred feet of straight line, the road crossed the Lackawaxen creek on trestle work about thirty feet high, with a curve of three hundred and fifty-five to four hundred feet radius. The impression was very general that the iron monster would either break down the road, or it would leave the track at the curve and plunge into the creek.

"My reply to such apprehensions was that it was too late to consider the probability of such occurrences; there was no other course than to have a trial made of the strange animal which had been brought here at great expense; but that it was not necessary that more than one should be involved in its fate; that I would take the first ride alone, and the time would come when I should look back to the incident with great interest.

"As I placed my hand on the throttle-valve handle, I was undecided whether I would move slowly or with a fair degree of speed; but believing that the road would prove safe, and preferring, if we did go down, to go handsomely, and without any evidence of timidity, I started with considerable velocity, passed the curve over the creek safely, and was soon out of hearing of the vast assemblage. At the end of two or three miles I reversed the valve the valve and returned without accident, having thus made the first railroad trip by locomotive, on the Western hemisphere."

Conduction of Air and Hydrogen.

Prof. Tyndall, in his lecture on "Vibratory Motion" at the Royal Institution, illustrated the very low conducting power of hydrogen for sound by a novel experiment. A bell struck by clockwork was placed under the receiver of an air pump, and the air exhausted as perfectly as possible. By applying the ear close to the glass a faint sound could still be heard. The exhausted receiver was then filled with hydrogen, when the bell was again heard to sound, but faintly. On pumping out the hydrogen all trace of sound ceased, even when the ear was placed close to the receiver. Hydrogen being about fifteen times lighter than air, it might be supposed that its low conducting power arose from its tenuity. But such is not the case; the conducting power of air, rarefied fifteen fold, and therefore of the same density, exceeds that of hydrogen in a marked degree.

IT is stated that timber rendered fire proof by saturation with silicates is extensively used in Germany for flooring planks, doors, and staircases.

THE NEW TEMPLE EMANUEL.

The above is the name of the new Jewish synagogue recently dedicated situated on Fifth avenue and Forty-third street, New York city. Few buildings ever erected in this country, have attracted more attention, or are more entitled to admiration than this edifice. As a specimen of Moorish architecture, slightly modified to adapt the structure to its destined use, it affords a good study to professional architects and to all lovers of art. It occupies a lot one hundred and four feet on Fifth avenue, and one hundred and eighty-four feet on Forty-third street. It consists of a nave thirty-four feet wide, one hundred and sixty feet long, and seventy-two feet high, with transepts of about ninety feet in length, attached to which are aisles about twenty feet wide, containing the galleries. In front, on either side of the nave, rise two towers detached above the aisle walls, but connected with the nave by two bridges on a line with its ceiling and with the choir gallery, as well as by open balconies running all around the front. These towers are to be about one hundred and seventy feet high, and are to terminate in stone cupolas, the surfaces of which are to be covered with relief ornaments. The building is built of sandstone, out of the New Jersey, Cleveland, and New Brunswick quarries—each of these being used and a ranged with reference to its color. The entire cost of the structure and ground will amount to nearly a million dollars. The architects elected by the building committee were Mr Leopold Eidlitz and Mr. Henry Feuerbach.

The *Evening Post* gives a graphic description of the new temple and designates it as a "poem in stone:"

"All admirers of fine architecture will first be impressed with the façade Its fine proportions. varied color, and rich ornamentation are elements of beauty worthy of close study. The openings of the nave—the five entrance doors, the rose window and the transverse gallery near the apex—together with those of the tower crowned with open octagonal domes, are so many distinct forms hapily grouped and tastefully treated The ornamentation throughout is honest, appropriate, and rich. Foliated capitals, delicately sculptured, and clustered columns attached to the doors and windows, fretted spandrils and light pinnacles, rising like minarets from the buttresses of nave and transepts, supply imaginative points of great value in the matter of expression. The bright cream-colored pinnacles relieving against a blue sky and on the brown rubble, sparkling like so many jewels in their setting, animate the entire front and forestall anything like monotony of outline. Various intaglio designs, consisting of intricate mazes of lines peculiar to the Moorish system of decoration, fascinate the eye and enliven surfaces that would otherwise appear sombre. This fine combination of ample forms and ornamental devices, each in appropriate relationship for use and beauty, secures to this building an elegant and majestic air, which more ostentatious structures of greater magnitude fail to convey. The secret of this effect does not lie in size or in richness of decoration, but in proportion, a quality of all others in architectural art the subtlest and most rarely encountered.

USE OF COLOR.

"Attractive as the exterior is, the interior far surpasses it. On entering the building we seem transported to another sphere. Here we enter on the realm of color; forms seem to have vanished or to resolve themselves into radiant splendor. Color as an architectural element appears to reign supreme; we have that which the Orientals, the acknowledged masters of this element of art, most delighted in. The problem they have solved through the skillful handling of ornament, and a consequent distribution of color, is the production of general effects not only pleasing in themselves, but also harmonizing with the constructive masses. The Jews in their Bible, and the Mohammedans in their Koran, prohibited from depicting animated forms, have been obliged to make the most of color on its own merits; color, consequently, is their principal decorative medium. Yellow or gold, blue, red, black, and white are their vehicles of art expression. All muddy compounds of hybrid tints, miscalled color in many modern pictures, are completely ignored. The only figures they employ are delicate arabasques. and patterns arranged in a capricious but still regular manner, and which, adapted to the eye in conformity with its sensuous aptitude challenge no criticism on the score of their non-resemblance to known natural objects. Gorgeous hues, therefore, in true complementary union, cover the spacious walls of this edifice; the eye wanders over them attentive to their innumerable harmonies as the ear listens to the infinite harmonies of musical sounds. Draped arches, festooned with divers tints, support blue panels decked with golden stars, while the stained glass windows, more like luminous interstices than anything else, pour in a flood of prismatic brilliancy to blend all together in soft and radiant light. The obscurities of the triforium, the sanctuary, the organ-loft, and other spaces, lend an air of mystery to the general tone, which is again enhanced by the dark reflections of the richly carved wood work. The general effect is one of subdued richness, an effect in harmony with a spirit of adoration, and with that instinct which leads man to exalt worship by art.

"The use of color in this building will attract all eyes to it, and make it a model for imitation far and wide. Mr. Eidlitz has used color elsewhere, and notably in St. George's Church, but nowhere on the same grand and effective scale as here Decorative motives generally consist of meaningless imitations of Renaissance ornaments, mouldings, panels and tracery bolstered up with artificial shadows, expressing no sentiment and symbolizing no truth. Color, as here employed, conforms to natural law, and is therefore a truth in itself. None of its combinations suggests the intellectual perversity associated with Renaissance symbols so conventionally applied to public and private edifices everywhere."

VENTILATION.

The *Journal of the Franklin Institute,* contains the first, or a part of the first of a second course of lectures on ventilation, delivered by Lewis W. Leeds, before the Franklin Institute during the winter of 1867-'68. There seems to be such an itching for scientific laurels at the present time, that the most common subjects, upon which all that is pertinent can be said plainly and briefly, are made the vehicles of professional display *ad nauseam.*

The subject of ventilation is an important one, and perhaps is not appreciated as it should be, or sufficiently provided for in either public or private edifices. Grant all that; but does it follow, that in order to cure the evil, long harangues upon the constitution of air, the physiology of respiration, the anatomy of the lungs, and the circulatory system, the diffusion of gases, and all the technical information in the remotest degree connected with the subject, should be aired in trying to convince people that unless they breath pure air their health will suffer? The first installment of these lectures treats of all the above-mentioned subjects, and more too. How much is to follow before the real gist of the subject shall be reached, we are unable to say. Perhaps a discussion of the respiratory apparatus of fishes and reptiles, with some accounts of toads which have been imbedded in rocks for nobody knows how many centuries, without breathing, and have emerged from their rocky prisons, "fresh as when in their pristine youth, etc," and hopped away without even thanking their deliverers. This might be made applicable to the subject of ventilation, as thus: The toad does not breath in the same way as man inhales the ambient air, consequently what is fun to them, would be death to you, my hearers Moreover, all the stories of living toads, imbedded in rocks and trees. are humbugs—except the trees were hollow and the rocks had holes in them—from which we conclude that man could not breath without air, or live without breathing. *Quod erat demonstrandum.*

How to get the pure air is the question; a purely mechanical one. Hot air rises—cold air falls. The impure gases do the same thing; therefore it is only necessary to provide for the escape of foul gases at the bottom of a room, provided it is heated with warm air, or at the top, if heated by radiation; the pure air being admitted in the latter case through openings protected so that strong currents shall not be formed, and the exchange of air being fully provided for by passing the vitiated gases through heated flues, or drawing them off by fans or other apparatus.

There is the whole thing in a nutshell and all the scientific discussion of things upon the earth or under the earth can't make it more so; so the SCIENTIFIC AMERICAN believes and we believe its practical readers will concur.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING SEPTEMBER 15, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *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.*

82,058.—MORTISING CHISEL.—Otis Adams and James Hatch, San Francisco, Cal.

We claim making the lips beveled from the edge to the main part of the chisel, and with the ends beveled and inclined, as herein set forth.

82,059.—LAMP BURNER.—Thomas Adams, Hudson City, N. J., assignor to himself, J. L. Romer, and H. T. McCoun, Brooklyn, N. Y.

I claim, 1st, The flattened, cone shaped wick tube, A, provided with a triangular opening, f, for admission of air in front, as it were, of the single wick, to establish a current through the center of the flame, and constructed so that in the passage of the single flat wick through it in a straight line, or thereabouts, from below, said wick is made to assume an annular form at its exit from said tube, substantially as specified.

2d, The arrangement of the wick lifter or operating device, E, relatively to the straight or entering portion, e, of the tube, A, constructed as described, and for operation in connection with the latter to turn and convert the wick from a flat or straight into a round or annular form, essentially as herein set forth.

3d, The base portion of the burner, of globular or enlarged character, as described, and divided, as at h (forming a cap, D), between the collar screw of the lamp and draft opening or openings to the flame, as and for the purpose herein set forth.

82,060.—CULTIVATOR.—A. H Allison, Charlottesville, Ind.

I claim, 1st, The yoke, C, secured to the under side of the tongue, and provided with the adjusting blocks, e g, in combination with the beams, G G, uprights, f f, provided with adjusting holes, double tree, c, arms, c' c', and braces, connecting the ends of the yoke with the main frame, all constructed, arranged, and operated in the manner and for the purpose set forth.

2d, The beams, G G, hinged to the adjusting blocks, g g, and provided with the shanks, i i, and braces, h h, in combination with the bails, J J, and foot pieces, Z Z, all constructed, arranged, and operated as set forth.

82,061.—SCHOOL DESK.—Herbert L. Andrews, Chicago, Ill.

I claim, 1st, The standard, composed of two parts, A B, one provided with the projection, g, and axle, i, and the other with the flange, a, in combination with the arm, C, the standards being secured by the screws and nuts, all substantially as specified.

2d, The combination and arrangement of the recess, b, when filled with rubber, or other elastic material, standard, B, and projecting heel, h, of the arm C, substantially as and for the purposes specified.

82,062.—BLACKBOARD. Herbert L Andrews, Chicago Ill.

I claim the blackboard, A, when provided with the groove, o, arms, c, pins or hooks, c, and supporting, constructed, and operating substantially as specified.

82,063.—LEATHER STRETCHING MACHINE.—W. R. Andrews, and Robert Dingwell, Newark, N.J.

We claim, 1st, The movable beam, B, in combination with the cross slat, C, when constructed and operated substantially as and for the purpose set forth.

2d, Operating the movable beam, B, by means of the ratchet bars, E E, and screws, D D, when constructed and arranged as specified, and for the purpose set forth.

82,064.—STOCK PUMP.—W. T. Armstrong, Freeland, Ill.

I claim the box pump, E, constructed as described, in combination with the stationary pipe, F, rod, D, and the compound hinged platform, B C, all constructed and arranged to operate substantially as shown and described.

82,065.—MOLDING PIPE.—John Aston, Pittsburg, assignor to William Smith, Allegheny City, Pa.

I claim, 1st, The combined arrangement of the flask, G, and hinged door G g, substantially as described.

2d The pit, A, furnaces, B, with their flues, C, and outlets, Cc, ramming up stools, D, stoppers, E, nozzle, F, and sliding thimble, Ff, the bars, K, and slide plates, L, when combined and arranged substantially as herein described and for the purpose set forth.

3d, Drying pipe molds by means of passing currents of heated air or gases through them, without removing them from the pit in which the operations of molding and casting are carried on, substantially as described.

82,066.—JOURNAL BOX.—John E. Atwood, Mansfield, Conn., assignor to himself, A. Sprague, and W. Sprague, Providence, R. I.

I claim the annular rings or collars, B*, near each end of the journal, in combination with the caps or shields, D, and the chambers, C*, provided in the journal box, all arranged substantially as herein set forth, for the purpose specified.

82,067.—SHINGLE MACHINE.—J. E. Austin Oswego, N. Y.

I claim, 1st, The method of operating the tilting tables, F F, namely, the projecting arms, f, obliquely slotted slide bars, H h, the hooking connecting rods, I I, and crank wheels, J having adjustable wrists or crank pins, all arranged and operating as herein shown and described, and for the purpose set forth.

2d, In connection with the tables, F, the laterally adjustable plate and socket block, N ll M, and vertically adjustable fulcrum block, K L, constructed and operating as herein shown, and for the purpose described.

3d, The bolt cutters, C C, having a horizontal movement on frame, D, and provided with wedges, s s, for acting on inclined surfaces of said frame, D, in such manner that all sides of the bolt holders are lifted alike, in connection with tippet lever, R, and link, P, or other suitable device for obtaining the sliding movement of bolt holders on frame, D, as and for the purpose described.

82,068.—WAGON AXLE. C. D. Bachelder, Camden, Me.

I claim, 1st, The combination, with an axle provided with an oil recess, b, of the cap, g, arranged oil tight thereon, and provided with a slot for the wick, substantially as and for the purpose described.

2d, The recess, b, provided with the dividing rib, c, having a recess, d, for the wick, communicating with the recess, b, by the holes, e, substantially as and for the purpose set forth.

82,069.—WAGON JACK.—E. R Baldwin, Southfield, Mass.

I claim the combination, with the bracket, B, and stand, A, of the friction rollers a and b, when applied and arranged as and for the purpose set forth.

82,070.—KNOB LATCH.—T. C. Ball, Bellows Falls, Vt.

I claim the combination of the lock ring, h, slots, c, and projections, k k, with and between the plates, rescuecheon, b, and its projections, e and e', and the ring, g, with its slot, i, all operating together as and for the purpose set forth.

82,071.—ENAMEL FOR WINDOW-SHADES Edward C. Bancroft, Henry M Bancroft, and Ed. H. Bancroft, Syracuse, N. Y.

We claim the employment of the within compound in the manufacture of cloth window shades, for the purpose described, substantially as set forth.

82,072.—ELASTIC DRAFT ATTACHMENT FOR SINGLE AND DOUBLE HARNESSES.—John Barron, Cincinnati, Ohio.

I claim the combination and arrangement of the India-rubber draft attachment, B, adjustable check strap, rods, or case, C, and coupling, G, substantially as and for the purpose herein specified.

82,073.—VISE.—Thomas L. Baylies and Edwin Crawley, Richmond, Ind.

We claim, 1st, The combination of the devices operating automatically, by which the action is changed from the adjusting to the compressing screw or screws, by a continuous turning of lever, a, in one direction, and the action of the screws is reversed by a continuous turning of said lever in the opposite direction, substantially as set forth.

2d, The combination of the pins, c and c', and slots, b and b', with the sleeve, G, and screws, F and E, substantially in the manner described and for the purpose set forth.

3d, The bowl, J, and trigger, H, in combination with the screw, E, adjusting screw, f, and sleeve, G, the latter being provided with a ratchet, as specified, and all operating substantially as described and for the purpose set forth,

82,074.—PLANE.—Valentin Bitsch, St. Louis, Mo.

I claim the combination of the bit, a, having its lower cutting edges to form a re-entering angle, with the open shank bit, a', having its lower cutting edges arranged with beveled corners, acting with the plane stock, A, to form blind slats, whose narrow edges are chamfered, substantially as set forth.

82,075.—FARM GATE.—Charles S. Bonney, Penn Yan, N. Y.

I claim the hinges, D E, when made and applied as specified, and used in combination with the gate, substantially as and for the purpose set forth.

82,076. REFRIGERATOR.—Wilson Bray, Stockton, N. J.

I claim the forming or producing of a current of air within the provision chamber of a refrigerator, by means of a rotary fan or other mechanical device, so arranged as to impel or force the air through an ice box or water vessel surrounded by a freezing mixture, and also through a vessel containing charcoal or other absorbent of moisture and noxious gases, substantially as shown and described.

82,077.—MACHINE FOR FORMING EAVES-TROUGHS.—John Brett, Memphis, Mich.

I claim the eaves trough former constructed as herein described, of the grooved bed plate, A, crimping clamp, F, hinged thereto, with its hinged continuation, H I, and slotted roller, D, all arranged and constructed as herein shown and described.

82,078.—SAW SHARPENING DEVICE.—P. M. Bristol, Ludington, Mich.

I claim the swaging apparatus consisting of shaft C, wheel, D, and rest, E, arranged and combined substantially as described.

82,079.—MANUFACTURE OF ARTIFICIAL FUEL.—George H. Bronson, New York city.

I claim the process of making artificial fuel in which pitch or other similar material is used to produce the agglomeration of the particles of the substance or substances which constitute the basis of the fuel, by first heating the coal or other substance, and, while it is heated, introducing among it the pitch or other similar material in a powdered state, substantially as herein described.

82,080.—APPARATUS FOR DOMESTIC MANUFACTURE OF GAS. John W. Brown, Wooster, Ohio.

I claim, 1st, The retort, D, in combination with a gas apparatus adapted to domestic use, and as described, constructed substantially as set forth.

2d, The arrangement whereby the apparatus is made self-regulating, by the pressure of the gas in the gas holder, substantially as shown and described.

3d, Using the surplus gas as fuel, either under the retort for generating gas, or for other purposes, by the automatic arrangement, substantially as described.

4th, In combination with a gas apparatus, the washer and tar receptacle, G, and purifier, K when the same are constructed and arranged substantially as described.

5th, The rake, l, in the retort, substantially as and for the purpose set forth.

82,081.—CHAIR SEAT.—E. L Buckingham, Jefferson, Wis.

I claim the strips, b, composing the chair bottom, secured in the rails, A, by being passed over and under said rails, the ends being inserted in oblique slots, a, and there retained by the strip, C, applied to the outer edge of the rails, A, all substantially as herein shown and described.

82,082.—CARRIAGE SPRING.—Azro Buzzell, West Fairlee, Vt.

I claim my improved arrangement of the three springs A B C, as described, without any connection extending from or about from the middle of one spring, B, to or about to that of the spring, C, the whole being as shown in the drawings.

82,083.—LUBRICATING MATERIAL.—Calvin Carpenter, Jr., Astoria, N. Y., assignor to H. H. Wolcott, New York city.

I claim a lubricating material prepared from crude petroleum, in the manner above set forth.

82,084.—ANGULAR SHAFT COUPLING.—John M. Case, Worthington, Ohio.

I claim, 1st, Forming the bars, upon which the segmental cogs, E, are cast solid, substantially as herein shown and described and for the purpose set forth.

2d, Forming grims or flanges upon the sides of the segmental cogs, E, for the purpose of preventing their lateral movement, and relieving the side pressure upon the connecting bars, F, as herein shown and described.

82,085.—WRENCH. Luke Chapman, Collinsville, Conn.

I claim the combination with the jaw A, provided with the recess, B, and annular groove, C, of the nut, D, and the spring ring, E, substantially as and for the purpose set forth.

82,086.—CAR WHEEL AND FROG.—W. H. Childe, Gainesville, Ala.

I claim uniting railroads of different gages by means of a frog applied at the junction of two or more tracks, and constructed as described, and by railroad wheels constructed with two or more independent treads, the said frog and wheels being employed together, but one former also permitting wheels with a single tread to pass over it, all substantially as described.

82,087.—MEASURING FUNNEL.—Charles Chinnock, Brooklyn, N. Y.

I claim the arrangement within the funnel of the stem, B, carrying the valve, C, at its lower end, whereby the weight of the funnel closes the valve when the latter is suspended by the stem for filling, substantially as herein set forth.

82,088.—FEED BAG.—Charles Chinnock, Brooklyn, N. Y., assignor to J. Little Hyde, New York city.

I claim the combination of the endless cord, c, and pulleys or slides, b, with the feed bag, A, all arranged and operating essentially as set forth.

82,089.—CULTIVATOR.—Joseph H. Clifton, Newcastle, Pa.

I claim, 1st, The board, A, provided with the knives, a, etc., and teeth, b, as and for the purpose set forth.

2d, The board, A, in combination with the bar, c, and teeth, c', as and for the purpose set forth.

82,090.—SHUTTLE.—Nathan Clough, Lowell, Mass., and James Baldwin, Manchester, N. H.

We claim a shuttle having its tip-shank riveted to the wooden plug, and the plug secured in the shuttle, as herein described.