

**BELT COUPLING**—Samuel Green, of Grand Rapids, Mich., (assignor to Silas B. Green, of Rochester, N. Y.): I claim the plate or stock, C, slotted and provided with tongues, D, one or more, corrugated at one edge, and provided with spurs, G, the whole being constructed, arranged, and applied to the ends, A B, of the belt, so as to act substantially as and for the purpose set forth.

[This invention consists of a metal plate or stock of oblong form, equal in length to the width of the belt to which it is applied, and firmly riveted to one end of the belt parallel with its edge. This plate or stock has one or more slots in it, in which slots tongues corrugated or grooved at one edge, and provided with spurs, are fitted. The opposite end of the belt is passed through the slot or slots in the plate or stocks, and, owing to its relative position with the tongues and plate, is firmly secured therein by the tension of the belt, and the two ends of the same are, consequently, firmly connected.]

**TRACKS FOR CITY RAILWAYS**—E. S. Gardner, (assignor to himself and John H. Gould,) of Philadelphia, Pa.: Disclaiming the exclusive use of a continuous tube with a slot on the top, as a device employed in atmospheric railways.

I claim forming between the rails of a city railroad track, an underground tunnel, and hanging a series of pulleys within the same, said tunnel having a longitudinal slot near the level of the ground, and being otherwise so arranged that a rope may be used for drawing the cars along the track, without impeding the passage of the vehicles across the same.

**SHIP'S BULKHEAD**—Charles Maliphant, (assignor to Thomas West,) of New York City: I claim the arrangement of two or more thicknesses of crossed planking, the interposed felt, or other equivalent material, and the stanchions with each other, substantially as specified, and for the purpose set forth.

**EGG-BEATER**—Patrick Mihan, (assignor to himself and G. Davis,) of Boston, Mass.: I claim the beating apparatus, constructed and operating substantially as described, in combination with the portable plate or cover A, so that it may be either held in the operator's hand, or placed on the top of a vessel.

**REVOLVING FIREARM**—F. D. Newbury, (assignor to R. V. DeWitt, Jr.,) of Albany, N. Y.: I claim the lever, L, formed and fitted as described, for the purpose of cocking the hammer, holding the same when it has been cocked by hand, rotating the cylinder, and holding the cylinder firmly in the act of firing.

I also claim the hammer, with its pin, b, in combination with lever, I, for cocking by hand. The combination of hammer, lever, ratchet wheel, and trigger, arranged substantially and for the purposes set forth.

**RAILROAD CAR AXLE BOXES**—R. N. Allen, of Cleveland, Ohio: I claim, first, The self-adjusting collar or washer, F, in combination with the slide partition, G, and packing, C, operating in the manner and for the purpose specified.

Second, I claim the box, B, and key, C, provided with articulating surfaces, a, b, in combination with the key, D, for the purpose of relieving the axle from strain, and of conveniently removing and replacing the box, B, and collar, F, by simply relieving the axle from strain, without removing it, the whole being constructed and arranged substantially as specified.

RE-ISSUES.

**MACHINE FOR MAKING HAT BODIES**—William Fasket, of Meriden, Conn. Patented January 23, 1846: I am aware that mechanical pickers of various constructions have been used in connection with pervious surfaces and exhausting fans, in the manufacture of hat bodies, and therefore do not claim such devices separately, or in their pre-existing combinations, as my inventions.

But I claim the described automatic method of forming hat bodies, having the required variation in thickness at their different parts, by supplying picked fibers to an exhausted former of the size and shape required, in such manner that a larger portion of picked fibers is supplied to that part of the former which corresponds with the thickest portion of the hat body, and a less portion to the other parts of the former, substantially as set forth.

I also claim the combination of a picking apparatus, a hat body former, an air-exhausting apparatus, and a conductor, the whole combined substantially as set forth.

I also claim a bow-string picking apparatus, constructed and operating substantially as set forth, to pick fur presented to it by a suitable feeding and nipping apparatus.

**METHOD OF EMPLOYING CENTRIFUGAL FORCE IN CASTING IRON PIPES**—Thomas J. Lovegrove, of Baltimore, Md. Patented November 30, 1852: I claim forming pipes, or other castings, by centrifugal force, by causing the mold into which the liquid material is poured, to revolve.

**GRAIN SEPARATORS**—John R. Moffit, of St. Louis, Mo. Patented November 30, 1852: I claim, first, The endless chains, d, composed of metallic links provided with protuberances or depressions, when used in combination with suitable driving pinions, to impart a positive motion to the straw-carrier of a thrashing or separating machine, as explained.

Second, in combination with a receptacle in which the tailings are deposited by the winnowing apparatus, I claim the arrangement of the screw elevator, a, in relation to the thrashing cylinder, for the purpose of returning the tailing to be re-thrashed, as set forth.

DESIGNS.

**COPYING PRESS STAND**—Charles H. Clayton, of New York City.

**LEGS AND POSTS OF IRON BEDSTREDS**—John P. Koch, of New York City.

ADDITIONAL IMPROVEMENT.

**CLASPS FOR METALLIC HOOPS**—James R. Speer, of Pittsburgh, Pa. Patented December 1, 1853: I claim bending the ends of the clasp across the apertures, b and c, so as to present an opening in the clasp for the insertion of the bent ends of the bands, at right angles, or nearly so, to the direction in which the bands are inserted in the clasp, in the manner and for the purposes described.

Lake Superior Iron.

Some very successful experiments have been made with Lake Superior iron ore, and marble as a flux, by which very excellent iron has been made by S. R. Gay, as we learn by the *Lake Superior Journal*. The experiments were made at Marquette, 411 charges being tried in a small furnace to test the flux, as it was supposed by many that it would not answer, but the iron was of a superior quality, and as the ore is plenty in that region, a great increase in the manufacture of the metal is anticipated. As marble is a carbonate of lime, there can be no doubt but it may be used for a flux in smelting where the common limestone cannot be obtained. For this purpose it should be reduced to very small pieces or to powder.

Ventilating Mines.

The thorough ventilation of our coal and other deep mines is a question of much importance, and is becoming more so every day, as our mining operations are extending very rapidly. In older countries, especially England, where deep mining has been carried on for a great number of years, on a very extensive scale, it would naturally be inferred that the utmost perfection in ventilating agencies would have been reached long before this period, but such has not been the case. It is only within the past two or three years that the greatest improvement yet suggested in ventilating mines has been carried out in that country. This consists in the employment of positive machinery for the purpose, which has been erected at the Abercarn collieries. It consists of a rotary fan driven by a small non-condensing steam engine; and it has been constantly at work, day and night, for more than two years, without once being stopped for repairs. The common method of ventilating fiery mines heretofore practiced, has been by a large fire kept burning at the bottom of an up-shaft, at such a distance from the main shaft that the air rushing down the latter to feed the fire, passed through all the workings, and then escaped in a rarified column through the up-shaft. This method is rude and inefficient, affording no remedy for an increase of air, except by enlarging the fire, and it is rendered useless by being extinguished when an explosion takes place—just at the very time when a greater quantity of fresh air is most urgently required.

The rotary fan at the Abercarn colliery was put up by the ingenious James Nasmyth, the inventor of the steam hammer; it is 13½ feet in diameter, has eight vanes, made of plate iron, each 3 feet 6 inches wide, and 3 feet long, fitted on a horizontal shaft. It is enclosed in a plate iron case, with large openings at the center, and trunks for discharging, something like our blowers for furnaces; but it exhausts from the mine, thus causing the fresh air to rush down the main shaft, and pass through the workings to the up-shaft. The mine is 300 yards deep, has seven miles of railroad in it, and fourteen miles of working courses. About 3,000 tons of materials—coal, iron ore, and fire clay—are raised from it weekly. The fan is driven at the rate of 60 revolutions per minute, and draws 45,000 cubic feet of air through the mine in that period. This quantity supplies an abundance of air for the miners; their health has been greatly improved, and they can now labor during a greater number of hours daily.

When an explosion takes place in a coal mine, the greatest danger of immediate suffocation to the workmen, arises, not so much by inhaling carbonic acid gas, as some have supposed, as by the lungs becoming clogged by inhaling fine flaky soot, which generally saturates the atmosphere. To avoid this danger, the miners who are not burned, generally cover their mouths and noses with their handkerchiefs, and lie down, but unless they receive a supply of fresh air very soon, they must perish. An explosion of some extent took place at the Abercarn colliery, since the above ventilating machinery was erected, but the flaky soot and foul air were abstracted, and the fresh air rushed in so rapidly that none of the miners lost their lives. It is believed that but for the rapid and effective action of the ventilating fan on the occasion, every person in the mine would have perished. The velocity of the fan can be augmented or diminished at pleasure; and as the mine is very dangerous, this is necessary, in order to supply an increased quantity of fresh air on a sudden emergency. Our mining companies would do well to pay much attention to this subject.

Laboratory—No. 1.

**Atoms.**—It is not derogatory to the human mind to say that it can neither comprehend great things nor small. It is a fact, that no man knows what an atom is; that is, an atom of any material in its smallest state of exist-

ence. Very few can comprehend the size of the earth we inhabit, or of the sun, or of the planet Jupiter, which immense orbs are but a collection of atoms, and which, after all, are only a few of the countless worlds of the universe. We can conceive the existence of a small particle of marble, or of wood, or of sugar, or paper; but when the mind endeavors to form a conception of the smallest particle of any of these materials, it falters. When again it considers that what appears to be the smallest particle of sugar or of marble can be further divided, and that, in reality, these materials consist of three other atoms of matter united to form one particle or atom of sugar, marble, &c., the idea is perplexing. It is an ascertained fact, that sugar consists of carbon, oxygen, and hydrogen; but the ultimate size of the atoms of any of these elements is beyond the mind's comprehension. Nevertheless, chemists give to atoms of all the elements an ultimatum, and assign to them a definite weight—that is, a weight by comparison of one to another. It is found that when one substance unites with another, it does so always in a definite regular proportion; thus one hundred parts of oxygen always unite with double their weight of sulphur, four times their weight of selenium, and eight times their weight of tellurium, and so on with every other element, sometimes higher in weight, and at others lower, as the case may be; but it never varies for each specific element. Hence, after numerous experiments performed with the greatest care, chemists have fixed an atomic weight to all the elements, which is the proportion with which they combine with each other; though of different weight, yet they are atom to atom.

SEPTIMUS PRESSE.

Difference of Sight and Hearing.

**MESSERS. EDITORS**—I am rather fond of trying experiments on myself, and in consequence make observations that would, perhaps, occur to few others. I have just made one on which I should like your opinion, and at the same time communicate the fact to your readers. My sight is very good, never by any chance do I use spectacles, and yet for the last fifteen years I have observed that I am long-sighted with my left eye, and short-sighted with my right eye; and I can hear the ticking of a watch at a greater distance with my right ear than with my left. I should like to know if this is a common occurrence.

L. R. BREISACH.

[The reason that one eye or ear is more sensitive than the other, is because each has a separate nerve, and one of these may be constitutionally stronger than the other, or one can be weakened by a bad light on one side, or too much exercise of the one member. As to the commonness of the occurrence, we never heard of the fact observed by direct experiment before; but any of our readers can try for themselves, by holding a watch at gradually increasing distance from each ear, until the ticking cannot be heard, and noting distance each side; a small ink-spot on a sheet of white paper will serve to test the eyes.—E.S.]

How to Raise a Fallen Horse.

We have seen it recommended by a gentleman who has had much experience in the matter, that when a horse has fallen from the slippery state of the ground, the readiest method of enabling him to rise is to put an old rug or carpet under his forefeet, and he will be able to get up at once. Many horses are seriously strained by their efforts to rise on slippery ground, and this is most particularly the case with those of high spirit, and frequently those of greatest value are so frightened by the fall that greater injuries to themselves, as well as danger to those in the carriage, ensue from vain efforts to get them up than by the fall. Let the driver leap down at once, and assist the horse to get in position to get up, at the same time placing the rug, carpet, or even an old coat, under his feet.

Recent Patented Improvements.

The following inventions have been patented this week, as will be found by referring to our List of Claims:—

**WALKING STICK GUN.**—Robert R. Beckwith, of New York city, has invented a new walking stick gun; and although we cannot explain it so as to give any definite idea of it without the aid of drawings, yet we can say that it is very simple, and the mechanism to effect the cocking and letting-off of the hammer to fire the gun, is also of very simple construction.

**DAMPER FOR AIR-HEATING FURNACES.**—The object of this damper is to prevent the over-heating of air in the hot air conducting pipes of air-heating furnaces, when the register of the pipes is wholly or partially closed. This over-heating of the air in the closed pipes is attended with dangerous consequences, as adjacent woodwork is frequently ignited, and buildings are burned down, which is a great objection against the use of such furnaces for warming buildings. The invention consists in placing in the lower part of each hot air conducting pipe, a valve or damper, hung on an axis in nearly an equilibrated state, so that when the register of the pipes are closed, and the draft through them consequently stopped, the dampers will close by their gravity, and shut off the pipes from the air-heating chambers, and when the registers are fully, or more or less open, the dampers will be opened to a corresponding degree by the draft. It is the invention of Ebenezer Barrows, Jr., of Brooklyn, N. Y. An engraving of this invention will shortly appear in our columns.

**COTTON GIN.**—This is an improvement in what is known as the "roller gin," for ginning Sea Island or long staple cotton. The object of the invention is to expedite the process to a very considerable degree, without injuring the staple or fiber. The object is attained by the use of a roller, vibratory stripper, pressure plate, yielding feed-board, and screw, used in connection with doffers. Hiram W. Brown, of Millville, N. J., is the inventor.

**CUTTING THE LEAVES FROM SUGAR CANE.**—Calvin Dickey, of Mercersburg, Pa., has invented a machine for the above purpose, previous to crushing or grinding the stalks for sugar. The invention consists in having a cutter attached to a tubular flanch, so as to form a hollow cutting cylinder—this cutting device being connected with a grinding or crushing mill in such a way that the stalks of sugar cane will be drawn through it by the rollers of the mill, and the leaves will be cut from the stalks.

**MACHINE FOR TURNING TOOL HANDLES.**—Hiram Plumb, of Honesdale, Pa., has invented a new machine for the above purpose. It consists in the employment of a series of cutters combined with a pattern and stops, so that the desired articles can be readily turned and cut successively from a bolt or stick, in an expeditious and perfect manner. The invention also consists in a peculiarity of the finishing tool, whereby the articles, as they are finished, are cut off from the bolt, and they present at their ends a smooth and finished appearance.

**REVOLVING CYLINDER STEAM ENGINE.**—This invention consists principally in two hollow stationary steam heads, applied and arranged to serve as journals for the main drum or fly-wheel of the engine, and bearings for the cylinder journals, while they also serve as valves to effect the eduction and induction of the steam to and from the cylinder. The inventor is Thomas Rogers, of Philadelphia, Pa.

The great iron district of South Wales has suffered from strikes very severely, and at the present time the men are only just coming back to work after a very protracted strike, the cause of which was a reduction of wages. This was a necessary consequence of the late hard times, but we are glad to chronicle the fact that the iron trade throughout the world is again on the improving scale.