namental brass work. A number of finely formed vases o excellent design have just been delivered from the bras foundery. They are, however, the reverse of sightly being of a dull, spotty, copper color. The workman has a number of bundles of them strung on wire, and is treating them to a series of baths of diluted aquafortis. The vases are first immersed in a weak solution, which removes earthy matter and the outer skin. They are then moved to a stronger solution, in which the liquid, while the brass is in the bath, bubbles violently, giving off a strong vapor of sulphuric acid gas: it is then moved to the third bath, and, after a few alternate plunges, is ready for drying, a wonderful transformation having taken place during the process, the final dip giving the article a beautiful but evanescent color. The precipitate in these baths is copperas, which is readily salable. Following the vases we have been referring to, we find that they are thoroughly dried in heated sawdust, when they are ready for the burnisher.

BRASS BURNISHING.

While the vases are being dried, we notice that some boys are very deftly filing the edges of brass castings, and learn that hundreds of boys are engaged at this work in Birmingham. One of the vases having been thoroughly dried is passed to the burnisher, who rapidly enhances its beauty greatly, by burnishing the shields and other projecting parts of the ornaments. His appliances are his burnishing tool, a Chartley Forest stone upon which to polish it, a solution of soda to keep his hands free from grease, and gall in which to dip the tool and help its slipping action. Gall is a very valuable commodity in Birmingham. From the burnisher the work is conveyed to the lacquering room. This part of the work is done very neatly and effectively by women, and is necessary, as may be known, to the preservation of the color of the metal and to the preservation of the surface indeed. Quick drying is essential here as in the painting room; and to provide this, the room is furnished with large flat-topped stoves, heated by gas, which obviates the smoke and dust that would be produced by stoves heated by coal. Brass tubes are lacquered upon an iron tube through which a jet of steam is passed. Any depth of tint can be given to the lacquer, but whether deep or light all brass work receives a number of coats. In this room we noticed a variety of brass bedsteads of very charming designs in twisted, taper, and plain pillars, with ornaments of great beauty."

About 200 people are employed by Mr. Whitfield in all the departments of the trade, and from his works bedsteads of every form and pattern, and of widely different prices, are sent to all parts of Great Britain. The works are admirably arranged, and every care has been taken for the comfort and convenience of the work people. The ventilation is admirable; the shops are large, lofty, and airy.—*Iron.*

A New Comet.

The inhabitants of this part of the world are likely, before long, to enjoy the evening entertainment of a brilliant comet, which is now barely visible in the western sky; but it is approaching the earth and sun with great velocity, and will soon be a conspicuous object in the heavens. This comet was first seen on the 17th of April, at Marseilles, France. It was discovered here June 8th, by Professor Lewis Swift, of Rochester, N. Y., who gives the following particulars:

"It is approaching both the sun and the earth with a constantly accelerated velocity, arriving at perihelion (nearest the sun) and perigee (nearest the earth) about the 1st of August. I see nothing, therefore, to prevent its being a very conspicuous and beautiful object in the western sky during the months of July and August. It is now situated, at 1

o'clock in the morning, directly beneath the polar star, and about twenty-five degrees from it, and is just visible to the naked eye. With an opera glass it can be easily seen as a hazy nebulous mass, with a bright point a little to one side. Through my telescope of four and one half inches aperture, six feet focus, it presents a, tail filling the whole field, with a low power of thirty-six. So directly toward us is it moving it seems almost to stand still, its slight deviation from it giving an apparent motion toward β *Ursæ Majoris.* It is now visible all night, but will soon be so only in the early hours of evening, setting in the northwest.

If at the time of its nearest approach to the earth the moon should be absent, we may expect, from present indications, to be treated with a cometary display which may rival the transit of Venus in popular as well as in scientific interest. The comet will be brightest on the evening of August 3, being then 245 times as bright as at the time of discovery, while now it is only 5½ times as bright; and as the moon will be absent, it will be subjected to spectroscopic analysis under circumstances more favorable than may occur again in many years. It will then be about 5° from Denabola, the brightest star in *Leo."*

To assist those of our readers who are not versed in astronomy to find the comet, we give a diagram showing the seven bright stars forming what is commonly known as the Dipper, from which the observer will carry imaginary lines down to three smaller stars below the Dipper, thence obliquely to the right, where the comet will be found. Just at present a spyglass or an opera glass will be needed to assist the vision; but in a few days the comet's tail will stand out clearly, and a special search will be unnecessary.

Three Thousand Five Hundred Miles by Railway.

The new route between San Francisco and New York is thus composed:

	Miles.
Central Pacific—San Francisco to Ogden	878
Union Pacific—Ogden to Kearney	835
Burlington & Missouri River, in Neb.—Kearney to Hastings	40
St. Joseph & Denver City—Hastings to St. Joseph	226
Hannibal & St. Joseph—St. Joseph to Hannibal	206
Hannibal to Louisiana	25
Chicago & Alton—Louisiana to Chicago	275
Michigan Central—Chicago to Detroit	284
Great Western—Detroit to Suspension Bridge	230
New York Central—Suspension Bridge to New York	447
Across the Continent	3,446
TO BOSTON.	
San Francisco to Chicago	2,485
Chicago to Albany	818
Albany to Boston	201
	3,504

THE cheapest articles of which we have lately heard are alligators. A correspondent from the South says that you can buy them five feet long at Perry, Ga., for one dollar a piece.

ALUMINUM SILVER.—The following alloy is distinguished by its beautiful color, and takes a high polish: Copper 70 nickel 23, aluminum 7, total 100.

Recent American and Foreign Patents.

Improved Watch Escapement.

George H. Knupp, Wapakonetta, O., assignor to himself and Harvey Brokaw, same place.—To prevent overbacking, the notched end of an escape lever with curved arms is so arranged as to guide the pin of a balance wheel back into a notch when the trouble occurs.

Improved Children's Carriage.

A C spring is attached to the front axle, and extends back over the hind axle, to which it is also attached, and then springs by a large curve around the body, which is suspended from it. The body of carriage is provided with a portion which may be made to serve both as a dash and a table.

Improved Hoof Trimmer.

Frederick R. Sutton and William G. Sutton, Wellington, Ill.—This invention consists of a pair of side bars pivoted to a toe piece, and connected, at the heel, by a right and left screw, constituting a frame, to be clamped upon the hoof by screwing the side pieces against it. On the frame is a cutter fixed in slots in the aforesaid side pieces, and provided with a cranked screw for forcing it up to the toe piece, to shave off the bottom of the hoof. At the toe is a gage, to regulate the amount to be shaved off, and on one of the side clamping pieces is a contrivance for quickly releasing the clamping frame from the hoof in case the horse becomes restive.

Improved Cross Cut Sawing Machine.

David R. Carter, Rockport, Ky., and Thomas H. Carter, Bremen, Ky.—This invention relates to a mechanical contrivance whereby a cross-cut saw may be operated by hand mechanism to so much advantage that one man may be made to do the work of six, the whole device weighing but about one hundred pounds, and being conveniently portable to the timber.

Improved Carriage Door.

F. Herman Jury, New York city.—This is a door pull handle and a holder for the sash-holding strap, combined in one device, and so arranged that both purposes are subserved by the one device better than by the separate devices as commonly arranged. The invention also consists of a novel contrivance of the device for connecting the strap holder, which holds the sash-holding straps up out of the way of the door when it closes to said strap.

Improved Feeder for Grinding Mill.

John Phillips and John E. Bradford, Scranton, Pa.—This invention consists of a hopper of two or more compartments, and a feed shoe, with a special compartment and regulating gate for each compartment of the hopper, all so arranged that two or more different kinds of grain, meal, or other material may be fed separately from different compartments into the stones at the same time. The object is to mix different kinds of grain substances more regularly and with less labor than they can be in the ordinary way of first mixing them and then feeding them together.

Improved Mowing Machine.

Frank H. Bryan, Troy, N. Y.—This machine may be reversed at each end of the field for cutting forward and backward along one side, for side hills and other places where it is not convenient to go around the field. It is also designed to effect the changes merely by turning the horses and the truck around without requiring the manipulation of any part by hand, except the raising of a catch pin.

Improved Level.

Dr. John Thornley, Charlottesville, Va.—This invention relates to an improvement in the class of levels provided with a hinged base bar for indicating different grades by the adjustment or angle to the body of the level proper. The improvement consists in arranging the block or prop piece to slide between the hinged bar and an inclined plane formed on the base of the level, so that the bar will be adjusted at an angle to the base corresponding to the distance it moves over the inclined plane. Means are provided for clamping the sliding block at any desired point, and the base is graduated to indicate the grade. The block is also connected with the base and hinged bar by a screw and dovetailed groove.

Improved Grave Mound.

Joseph R. Abrams, Greenville, Ala.—This invention relates to means whereby the dome of a grave mound is adapted to graves of different lengths and sizes by fitting thereto successively increasing elliptical pieces.

Improved Cheese Mill.

Abraham C. Brinser, Middletown, Pa.—This invention consists in a cheese mill in which are combined a vessel having a partially perforated bottom and rotary grinder, whereby cheese or smearcase may be ground and delivered free of lumps and in a uniformly granulated condition

Device for Registering the Slipping of Locomotive Wheels.

James W. Boyle, of New Texas, Pa.—This invention consists of a couple of wheels or disks independent of each other, driven synchronously, one by the truck axle and the other by the driving wheel axle. They are arranged with a cam and ratchet mechanism, so contrived that, in case the driving wheel slips, and thus turns one of said pulleys faster than the other, the pawl mechanism will be caused to move the recording apparatures one degree for each turn of one wheel more than the other, and thus record the slip.

Improved Wheel or Vehicles.

Michael Mickelson, Ashland, Oregon.—By this device, a tire may be tightened without removing it from the wheel. The invention consists in the pieces or caps in combination with the tongue and socket blocks formed upon the ends of a cut tire, and with the wedge or key that draws said ends together.

Improved Grading Scraper.

Jonathan C. Smith, South Solon, Ohio.—This invention consists of a road, ditch, or grading scraper, having the front portion, which carries the blade, jointed to the body portion, and provided with springs and pushers adapted to tilt the blade down so as to run into the ground when the scraper is drawn along the surface. Latches and levelers are combined with the said jointed front part and the handles, to turn the blade upward to run out of the ground when a load has been obtained by pressing the handle downward. Cams throw the latches into connection with the levers so that the blade may be turned up when the handles are pressed down. The handles pass down below the spring catches, to be fastened to the body by the latter to raise the rear end to dump the scraper by causing it to ro over on the front end.

Improved Boiler Flue Cleaner.

John Dykeman, Green Island, N. Y.—This invention consists in the combination of three toothed rollers, whether made solid or of toothed disks springs, and levers with each other, and a box for cleaning the outer surface of flues; and in the combination of a loose arm and a set screw with a box that supports the toothed rollers, the springs, and the levers, to adapt the machine to be attached to the tool rest of a lathe. In using the machine, the levers and roller are turned back, and the flue to be cleaned is placed upon the rollers, and its end is secured to the chuck of the lathe The roller and levers are then turned down upon the flue, the necessary pressure is applied by the weight or spring, the lathe is set in motion, and the machine is fed forward with the feed screw, cleaning the flue thoroughly.

Improved Spring Brace.

Sidney T. Bruce, Marshall, Mo.—The brace is connected to the carriage body adjustably, by means of a slotted or grooved plate. The front half of this plate is bent downward to accommodate the pin above it. Thus the bottom and top of the front spring being both fastened to a common point behind, whatever depresses the body of the vehicle similarly depresses the free end of an inflexible bar, which cannot go forward so as to enforce a perpendicular motion of the carriage body. The bars being fastened to the springs at the top and bottom in front, and to each other a the center, no force can project the springs, either front or rear.

Improved Movable Head Light.

Horatio G. Angle, Chicago, Ill.—By suitable construction, as the truck of the locomotive turns in passing around a curve, the head light is also turned, so that the stream of light may always be thrown upon the track. The light from the lamp may also be thrown more or less from a straight line to adapt it to the curvatures of the road.

Improved Kettle Scraper.

Samuel A. Potter, Emaline Potter, and John Potter, Fowler, Ill.—This is a scraperplate with a round or otherwise shaped rear handle at one side and a pocket guard for the fingers at the other side.

Improved Apparatus for Making Torpedo Envelopes.

Mahlon Chichester, Shelter Island, N. Y.—The paper bags for torpedoes have been made, one at a time, with the aid of a piece of board having holes and a hand pin. The present invention consists in an improved apparatus whereby a number of bags are simultaneously made, the paper being cut with one motion, and pressed into the holes by another motion, for any desired number.

Improved Fare Box.

Joseph J. White, New Lisbon, N. J., assignor to himself and Howard White, Tullytown, Pa.—This invention relates to apparatus for collecting passenger fares on rail cars, and consists of a cash box supported from the waist or shoulders of the conductor, to which is attached a flexible tube, having at its end a hand piece or receiving box containing an endless carrier, which is arranged on pulleys, so as to be moved, by means of a ratche and pawl operated by a spring lever, by the conductor. The conductor carries a hand piece in his hand, and, by virtue of the flexible tube and belt, he is enabled to pass it round among the passengers to receive the fares.

Improved Furnace for the Manufacture of Iron and Steel.

Edgar Peckham, Antwerp, N. Y.—This is a new method and apparatus for manufacturing steel blooms directly from the ore. It consists in the furnace patented by the same inventor, June 24, 1873, improved so that it has two series of ore chambers instead of one, so as to treat the ore at different degrees of temperature to remove sulphur and phosphorus, and so that one series may serve for a flue to heat the ore in the other series when the coal is impure.

Improved Hatchet.

Guilford Norton, South Boston, Mass.—This is a combined claw hammer and hatchet. The bit has projecting threaded studs, by which it is connected with the hammer portion, so that, when worn out, it may be removed and a new one substituted.

Improved Folding Desk.

David H. Pierson, Fort Rice, Dak. Ter.—This desk is made in sections which are hinged together and so arranged that they fold together and form a compact body, resembling in shape and proportion an ordinary field desk.

NEW BOOKS AND PUBLICATIONS.

A TREATISE ON BRACING, with its Application to Bridges and Other Structures of Wood or Iron. By Robert Henry Bow, Civil Engineer. With 156 Lithographed Illustrations. Price $1.50. New York: D. Van Nostrand, 23 Murray and 27 Warren streets.

This is an excellent and very explanatory book on the whole question of arranging the parts of any construction so that they shall be as little as possible affected by variation in the strains to which the erection is subjected. As a matter of course, the building of bridges is very extensively treated, and the examples explained and illustrated show that the author is a writer of considerable knowledge and very varied experience.

THE INTERNATIONAL OR METRIC SYSTEM OF WEIGHTS AND MEASURES. By J. Pickering Putnam. Price 50 cents. New York: Hurd & Houghton, 13 Astor Place.

A very able *resume* of the recent progress of the metric system in popular favor. Although many of the arguments used by the advocates of the method are well known, and are generally deemed irrefragable, they will bear repeating till the world has adopted this most simple and rational arrangement of weights, measures, and coinage, which, it must be now everywhere admitted, is only a question of time.

THE KEYSTONE BRIDGE COMPANY'S ILLUSTRATED ALBUM, embracing Iron Bridges, Roofs, Columns, Chord Links, and Shapes, with a Description of Long Span Bridges Quality of Materials, and Principles of Construction Pittsburgh, Philadelphia, and St. Louis: Keystone Bridge Company.

An elegantly printed and illustrated volume, which contains not only a full and interesting description of the large means and business operations of the extensive firm who issues it, but also much explanatory and statistica information, formulas, etc., of great value to the engineering profession to whose notice we cordially commend it.