RECENTLY PATENTED INVENTIONS.

Engineering.

EXHAUST NOZZLE.—Charles W. Umholtz, Bristol, Va. This invention provides an improved locomotive exhaust having a main central and supplemental surrounding passage, but with the nozzle proper independent of and detachable from the standpipe and supported upon vertical pins projecting from the top of the latter, which also has a vertical flange surrounding the base of the nozzle, but separated from it by a narrow space, which serves as the exterior or supplemental steam passage. Through this supplemental passage the steam has practically free exit, and the nozzle proper may be readily detached when required.

VALVE GEAR.—Fred. E. Smith, Boston, Mass. A rocker is yieldingly connected through springs with the eccentric rod, the rocker being also connected with the valve stem and, by a piston, with an auxiliary fluid cylinder, preferably containing oil, the ends of the cylinder being connected by a pipe. The movement of the rocker is thus controlled by the speed with which the fluid passes from one end of the cylinder to the other, so that the valve will always travel at a constant rate of speed, and prevent racing of the engine, giving a uniform motion to the driving shaft.

Railway Appliances.

CAR COUPLING.—Charles W. Stillians, Pueblo, Col. This device is more especially designed for a freight car coupling. A normally elevated vertically sliding link tilter is located in the rear of the link-engaging portion of a coupling hook or arm pivoted in the drawhead, in connection with mechanism for raising the coupling hook and depressing the link tilter. The coupling is strong and durable, and may be operated without danger to the trainmen, and the coupling link may be readily raised or lowered to suit opposing cars of different heights.

CAR COUPLING.—Hampton K. Smith, Union, S. C. This coupler comprises a drawhead capable of an interlocking connection with an opposing drawhead, while valve heads are carried by the drawheads to receive the air pipes for air brakes or steam pipes. The valve heads are so constructed that when the heads of two opposed couplers are brought together a connection is established between the steam or air pipes of the heads, and when the drawheads are uncoupled the valves in the heads automatically seat themselves and prevent the escape of steam or air, the connection and disconnection of the pipes being thus automatically effected.

ILLUMINATING TRACKS.—William E. Ferguson, Montclair, N. J. This invention provides means whereby one or more lights may be arranged between the rails of a track for lighting up the roadbed, the lights being so arranged that trains may pass over without injuring them. A board having battens on its under face at each end engages the webs of opposite rails, and pendent from the board is a series of hangers, in which are held electric lights, brought in circuit in the usual manner.

Mechanical.

CLUTCH.—Daniel T. Denton, Duluth, Minn. A strong, durable, and effective friction clutch is provided by this invention, the friction faces of which may be held in contact without exerting longitudinal or endwise pressure on the shaft, while the clutch gear is idle and does not rotate when thrown out of gear or out of frictional contact, thus enabling the operator to make adjustments or alterations or repairs without stopping the rotation of the shaft. The construction is such that the whole clutch and frictional device may be made in halves or sections when used with the split pulley, thus enabling it to be placed on the shaft without removing the latter.

Miscellaneous.

MUSICAL INSTRUMENT.-Dwight Kempton, Summerland, Cal. An improvement designed to greatly enrich the tone of stringed instruments, such as pianos, and whereby also the weight of the instrument may be reduced, has been devised by this inventor. It consists of a series of harmonic sections, each comprising an independent stringed supporting bar provided with a bridge and pins for holding the strings in place. Each harmonic section carries as many strings as are necessary to produce the desired tone, the hammer striking the series of strings simultaneously, and the several sections are placed sufficiently apart to make them independent of each other.

PENCIL POINTER.—Frank E. Flagg, New York City. The casing of this device has a socket plate with a conical bore to receive the pencil, the bore extending through a beveled face of the plate, while a disk having a beveled inner face and attached abrading material is held to revolve in close proximity to the beveled face of the socket plate, a clamp holding the pencil and a driving mechanism being connected with the disk and the clamp. The device is of simple construction, and is adapted to rapidly and perfectly point a pencil, producing a point as long as may be desired.

EASEL ATTACHMENT.—Henry J. Muhlfeld and Frank J. Spillane, New York City. To enable a student to sketch from casts or life in a crowded school room, the canvas or drawing board needs a support and adjustment not easily obtained, an object this invention is designed to facilitate, providing therefor an attachment for chairs or other supports consisting of vertical supporting rods adjustable toward and from each other, and supports for such rods, there being picture supports mounted on the upper portions of the rods. The device consists of two sections, each attached to the vertical side rail of a chair back at the back.

WINDOW CHAIR.—Adolph Boettcher, South Stillwater, Minn. This is a scaffold or chair constructed in two side sections, adjustably connected by a bar, forming a light and strong structure, which can be quickly fastened in a window to extend outward beyond it, being readily removable from one window to be carried to another. A guard rail may be used in connection with the device, and it is also well adapted for household use in the cleaning of windows, while it may be compactly disposed of when not in use.

VELOCIPEDE. — Martha E. Slocum, Meadville, Pa. The depending seat frame of this vehicle has outwardly projecting arms at its upper end, on which the hubs of large wheels are journaled, one on each side, an arm or arms rigidly mounted on the same axles carrying a supplemental small wheel or wheels. Motion is communicated from the treadle by sprocket wheels and chains to the axles of the large wheels, and the machine is designed to be especially safe and easy riding, so that it can be used by the most timid persons.

WHIP SOCKET.—Henry E. Schreader, Manteno, Ill. This invention relates to whip sockets having locking devices to prevent the whip from being abstracted. The socket has at one side a lock case, in which is a transverse slide rack with an external operating handle, there being a whip retainer at the inner end of the rack, the latter being engaged by a toothed latch, and a series of sliding tumblers engaging the latch. Keys having projecting finger pieces are pivoted in the case in engagement with the tumblers, and by changing the relative positions of the latter a great variety of combinations is made possible.

SIDE REFLECTOR.—Charles E. Plumtree, Spokane Falls, Washington. A reflector support which may be readily applied to any lamp is provided by this invention, the arrangement being such that the reflector can be moved to any position to throw the light where desired. The support has a collar secured by a set screw to the burner or other part of the lamp, a ring sliding in this collar having a socket in which is held an adjustable bar, from which the reflector is supported, the adjustment being maintained by set screws.

ADDRESSING MACHINE. — John P. O'Malley, Manistee, Mich. A type galley containing a series of addresses, at spaced distances apart, is supported on a longitudinally sliding carriage in a suitable frame. An impression block operated by a treadle effects the impression as the paper or envelope is held over the type bearing the desired address, and when the pressure is removed from the treadle the carriage holding the type galley is automatically moved forward the distance between two sets of addresses, the operation being repeated as many times as there are separate addresses on the galley.

SNATCH BLOCK.—Adams C. French, Seattle, Washington. This invention provides an inexpensive and durable block for hoisting purposes, which may be readily detached from its hook, and which is connected with the hook in such a way that the frame cannot spread. The construction is very simple, and the parts may be easily detached or united.

PUMP. — Melchi M. Grove, Garfield, Washington. This is a simple form of pump, which may be partially submerged in water, and which, by means of air pressure applied to the chambers, is designed to pump water rapidly. It is a pump which may be used for any ordinary pumping purposes, but is especially intended for irrigation, the invention covering various novel features of construction and combinations of parts.

GRAIN CUT-OFF.—Philander D. Thompson, Neligh, Neb. This invention relates to a combined cut-off and delivery spout for feed hoppers in granaries, elevators, and mills, providing a device which is inexpensive, and which can be operated either to cut off the supply completely or to cut it off from one point and direct it to another. The construction is designed to prevent the escape of any grain between the operating parts to clog the machine, and the various openings are made to register accurately, whereby friction is avoided.

STOVEPIPE COUPLING. — Francis P. Hart, Strasburg, Pa. This coupling consists of a sleeve piece having one end folded to double its thickness, and longitudinally notched, the unjoined edges of the sleeves having hooks folded internally, and a thin wedge being insertible within and between the hooks. The device is designed to facilitate the making of a neat and secure connection between the ends of stovepipe sections, whether the sections are adapted to slip-joint together or are of equal diameter where joined.

ANIMAL SHEARS.—Charles and Harry Burgon, Main Bridge, near Sheffield, England. This invention relates to improvements in instruments for shearing or clipping sheep or other animals, and provides improved means for applying and adjusting the pressure of the upper cutters upon the lower cutters, relieving the axis of the vibrating lever as far as possible from all bending strain. A spring latch retains the axis of the swiveling crosshead of the lever in its socket, while permitting it to swivel freely and allowing of its easy insertion and removal.

WINDOW FRAME AND SASH.—John Anderson, Hickson, North Dakota. According to this invention, one of the parting beads and one of the inner beads of the window frame are provided with a movable section, connected crank shafts in the frame connecting the movable beads to move them to and from the sashes, to permit the latter to swing outward. The attachment may be conveniently added to any window frame, and by its use the sashes may be swung outward to stand at a right angle, so that both sides of the glass may be conveniently cleaned.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS AND PUBLICATIONS.

RAILWAY CAR CONSTRUCTION. By William Voss. New York: R. M. Van Arsdale. 1892. Pp. 177. No index. Price $3.

Railway car construction, under the auspices of the Master Car Builders' and Master Mechanics' Associations, has reached a definite standard. The object of the present work is to describe in detail the improved construction of all kinds of cars and of all their parts, by the aid of very numerous illustrations. This idea is very adequately carried out. The work, we should conceive, is one which would be indispensable in the car factory, as the numerous dimensions quoted on the plans give them all the meaning of a large scale drawing. The publisher is the proprietor of the *National Car and Locomotive Builder*, and is therefore peculiarly well situated for publishing such a work. "Interchange of traffic codes," as adopted by the Master Car Builders' Association, are embodied, with illustrations as required. The work is without index, but its place is supplied by a very full table of contents.

HIGH MEDICAL CULTURE. By W. R. Dunham, M.D. Cambridge: Printed for the author. 1892. Pp. 225. No index. Price $1.

The author of this work believes that the present tendency of the schools is to teach medical practice without the science, and, as far as they attempt to teach medical science, to teach it incorrectly. The work is radical and claims to touch on medical science as based on the four vital properties of laws of organic force. One theory which he enunciates is that medicines by their presence provoke the various organs to increased, diminished or modified action, but are without action of their own.

THE METAL WORKER ESSAYS ON HOUSE HEATING. Arranged for publication by A. O. Kittredge. New York: David Williams. 1892. Pp. 407. Price $3.

This work is the outcome of prize essays on steam, hot water and hot air heating of dwellings, originally published in the *Metal Worker*. These essays are reproduced, together with a number of letters of criticism upon the prize essays, which letters were also originally published in the *Metal Worker*. The criticisms give a vivacity to the work which might have been found wanting in the more formal prize essays. A valuable feature is the addition of a section on the proportioning of radiating surfaces. The solution of this problem is precisely the great desideratum for practical work, and we welcome its publication in accessible form.

BULLETIN OF THE PHILOSOPHICAL SOCIETY OF WASHINGTON. Vol. XI. Washington: Printed by Judd & Detweiler. 1892. Pp. xxxi, 618.

Quite a large range of scientific subjects is contained in this volume of reports. Geology and astronomy are perhaps the controlling motives of the proceedings. A contents and exhaustive index are embodied in the work. The volume makes a very large octavo and testifies to the scientific activity of the society.

ELEMENTS OF MACHINE DESIGN. By J. F. Klein. Bethlehem, Pa.: The Comenius Press. 1892. Pp. vi, 212. Price $6.

Professor Klein has published the foregoing elements with notes and folding plates for the use of students in the Lehigh University, where he holds the chair of mechanical engineering. The work is profusely illustrated with cuts in the text as well as large plates. The index gives four columns of reference—to the page, to the formula number, to figures and plates and to the page number of tables. After the index, which may be referred to as a real model in its way, an appendix of gear tables is given.

STREET RAILWAYS. By C. B. Fairchild. New York: The Street Railway Publishing Company 1892. Pp. vii, 441. Price $4.

The above work is of interest as testifying to the enormous extension of the street railway industry. The introduction of electric and cable traction has greatly expanded the field of work. The subjects of electric, cable and horse traction, with a short notice of steam, air and gas motors, open the book. Elevated roads, tower building, track construction, discipline and rules for employes and passengers, together with the charters, franchises, bookkeeping, and street railway accounts, are the general topics included. The treatment is as practical as the titles above summarized would indicate. An interesting feature of the work is contained in Chapter 13, in which different types of street cars, 47 in number, built by 18 representative car-building companies of this country, are illustrated.

FOURTEENTH ANNUAL REPORT OF THE STATE BOARD OF HEALTH OF THE STATE OF CONNECTICUT. For the year ending November 30, 1891. With the registration report for 1890 relating to births, marriages, deaths, and divorces. Printed by order of the legislature. New Haven: Tuttle, Morehouse & Taylor, printers. 1892. Pp. xxxvii, 447, 202.

PRIMITIVE MAN IN OHIO. By Warren K. Moorehead. G. P. Putnam's Sons 1892. Pp. xv, 246. Price $3.

The deeply interesting work in archæology and anthropology executed in Ohio during the recent years with particular reference to late discoveries is given, in this book in most attractive shape. Numerous views of scenery and implements and plans of mounds and allied subjects give a vivid aspect to this treatment of an exceedingly popular subject. We note especially several references to Professor Putnam, who of late years has given considerable attention to Ohio anthropology, in the interests of the Peabody Museum.

SADDLE AND SENTIMENT. A story of the turf. By Wenona Gilman. The Outing Company, Limited. 1892. Pp. 284. Price 50 cents.

Horse racing, the development of man's noblest servant, under the auspices of the enthusiastic Kentucky horseman, the excitement of the race track interwoven with a thread of romance so as to weave the whole into the form of an attractive novel are the matter of "Saddle and Sentiment." It is enlivened by numerous illustrations, and will, we believe, find numerous readers.

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(4503) H. B. P. writes: 1. Some arc dynamos, the Wood for instance, have two brushes on each side of the commutator, with several bars of the commutator between them. Kindly explain the reason for using the two brushes. What advantage is gained? Why is no arc formed at the brushes by the short-circuited coils? A. The object in arranging the brushes as stated is to cut out a portion of the armature winding, thus reducing resistance and giving the conductors time to cool. 2. I have been told that arc lamps connected in multiple series on an incandescent circuit will consume the + and — carbons equally fast. Is such the case? A. This will not occur unless the carbons are of unequal size, or unless the current is an alternating one. 3. Will you advise me if there is any book on arc lamps?—the trouble in them, how found, and remedied? A. There is no book treating on arc lamps of all descriptions. We believe that most manufacturers of arc lamps publish information for the benefit of users.

(4504) G. M. R. asks: How is the noise we call thunder produced or caused? Is a side crank on steam engine stronger or in any way better than a center crank? Why does oil or any other lubricant aid a cutting tool in metal, since it certainly cannot touch the cutting edge? Experience has shown that lard oil used in cutting a thread for a tap makes a smoother job than most other oils, and as it could get no nearer the cutting edge, I fail to see what different action it has. A. The cause of thunder and of its prolonged noise is not well understood. According to some the action is similar to the explosion of powder in a gun. When lightning strikes a tree or building, the noise is intensified by the sudden disruption of the solid material, as the splitting of a tree or the tearing apart of the materials of a building. All lubricants depend upon their conductivity of heat to keep the edge of the tool and the metal operated upon, cool.