parts of the collar in positions to receive the strains of pulling the load without imposing such strains upon the hames.

WELL-ROD EXTRACTOR.—W. W. FRENCH, Vanderbilt, Mich. In this patent the invention consists in the novel construction and arrangement of a clutch device, and the object of the inventor is the provision of a simple and practical apparatus for extracting from well-casings the working rod whenever it becomes broken or uncoupled at a point low down in the well.

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

Business and Personal Wants.

READ THIS COLUMN CAREFULLY.—You will find inquiries for certain classes of articles numbered in consecutive order. If you manufacture these goods write us at once and we will send you the name and address of the party desiring the information. **In every case it is necessary to give the number of the inquiry.**

MUNN & CO.

Inquiry No. 4813.—For makers of steam pipe couplings having two cup-shaped balls, through which the steam can pass, and which can take any position; when cold, the coupling can be turned any way, but when the steam is turned on, the coupling maintains the position it originally had.

Inquiry No. 4814.—For manufacturers of fine gear wheels and pinions similar to those found in French clocks.

Inquiry No. 4815.—For makers of automatic electrical clocks for closing circuits, having 24 figures on dial.

Inquiry No. 4816.—For tools, appliances and apparatus for sharpening small tools, punches, scissors, knives, etc.

Inquiry No. 4817.—For makers of elevators for large office buildings.

Inquiry No. 4818.—For makers of acetylene gas machines.

Inquiry No. 4819.—For the manufacturers of tools using the letter "W" in a diamond.

Inquiry No. 4820.—For makers of novelties and new patent labor-saving devices.

Inquiry No. 4821.—For makers of bicycle sundries, typewriters, novelties, etc.

Inquiry No. 4822.—For the manufacturers of the Tee handle air pumps.

Evaporation, Box 773, New York. Party who advertised as above, on March 14 last is requested to call at this office for a reply to advertisement.

Inquiry No. 4823.—For printing presses on which to print lithograph plates, and machinery, etc., for the manufacture of such plates.

Inquiry No. 4824.—For manufacturers of adding machines.

Inquiry No. 4825.—For manufacturers of buggies, pottery, novelties, etc., for the mail order business.

Inquiry No. 4826.—For the manufacturers of the Saxon rolling mill.

Inquiry No. 4827.—For makers of inventions or devices for outdoor advertising purposes.

Inquiry No. 4228.—For manufacturers of slot machines.

Inquiry No. 4829.—For manufacturers of advertising novelties.

Notes and 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.

Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.

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.

(9228) R. E. W. says: In the SCIENTIFIC AMERICAN of June 13, 1903, page 444, is an article regarding the Parsons turbine as an air compressor. Can you give me formula for computing volume and pressure of air compressed by this method? I wish to build an experimental machine, but can find no data on the subject, such as inclination and number of vanes and variation of pressure with variation of speed. A. The principle on which the Parsons turbine, when used as an air compressor, acts is similar to that of the ordinary revolving disk fans, such as are commonly used to keep the air circulating in offices and restaurants. These fans act exactly as the screw-propeller of a boat does; the velocity and volume of the air current produced depending upon the size and the angle of the vanes, and the number of revolutions per minute which the fan makes. If you will imagine such a fan placed inside a pipe approximately equal to its own diameter, you can readily see that if there were no slippage between the air and the fan, the quantity of air moved per minute would equal the area of the fan times the pitch of the blades times the number of revolutions made per minute. From this you can easily determine the velocity of the air current. The pressure against which such a fan may work is proportional to the square of this maximum velocity. There is, however, always a certain percentage of slippage, so that the volume of air and its velocity, as determined above, must be multiplied by a certain coefficient. The value of this coefficient depends entirely upon the size and number of the vanes, their pitch or angle, and the speed at which they are run. Unfortunately there are no experimental data to cover the case of the Parsons turbine, and the speed, size, and angle of the vanes here will be so different from the conditions of the ordinary ventilating practice that it is almost impossible to predict what coefficients should be used. The effect of the several rows of blades on the Parsons turbine, if the different rows of blades are all set at the same angle, would be simply to reduce the slippage, and to thus make possible the use of a very much higher pitch—producing a correspondingly greater velocity or pressure of the air current—than would be otherwise admissible. We trust that this explanation will be of service to you in directing the experiments which you are about to make, and we regret that there are no more definite data that we can send you as a guide.

(9229) W. R. writes: Your answer to W. E. H. (9107), July 25, states that only the force of gravity by falling weights, or I might add, a wound-up spring or springs when uncoiling, would give him the motor or power he is in search of. He objects to the aid of steam, water, electricity, etc., but only wants a mechanical power, such as wedges, inclined planes, or levers. Surely, he must know that no power could be given out from these agents unless a power had been applied to them. For his information, I would state that instead of springs or weights for driving clocks, or carriages, or phonographs, he can erect an overshot waterwheel (although he objects to water) to drive a clock perpetually, not by perpetual motion, which I see he has the sense to know is humbug, but by keeping the buckets full, with the rain or water from the mains. I erected one a year ago, and it has been going ever since and keeping splendid time, and will go on forever till it falls to pieces or rain stops falling.

(9230) M. L. says: How would I determine the foci of an ellipse, the diameters as 9 inches by 7½ inches being given? Would like a definite rule by which I could describe the ellipse. A. To determine the foci of an ellipse, when the axes are known, draw lines at right angles to each other and lay off the semi-axes from their points of intersection. From one extremity of the shorter axis as a center, with a radius equal to half the longer axis, describe an arc cutting the longer axis in two points. These points are the two foci. An ellipse is most easily and accurately described by drawing the two axes as above, and setting a pin at the two foci and at the extremity of the minor or shorter axis. Then tie a fine cord, which does not easily stretch, around the three pins, forming a triangle. Now remove the pin at the extremity of the minor axis, and with a pencil having a sharp point, take the thread on the point of the pencil where the pin has been removed. Now draw the curve, keeping the thread at a uniform tension. The loop of thread slips around the pins which are at the two foci, and each point of the curve obeys the definition of an ellipse, which is: "A curve each point of which has the sum of its distances from two fixed points a constant quantity." This constant quantity is the major axis.

(9231) H. F. says: I have had a curious experience with watches that I am at a loss to explain, and should be glad to know whether there is any reason why a watch might keep good time when carried by one person and be wholly unreliable when carried by another, under apparently the same conditions. My first watch had been in use a good many years when it came into my possession. After some time, about half of which the watch was in the repair shop, I concluded that it was worn out, and bought a new one with as good works as I could get. This watch kept accurate time for two or three days, or even a week at a time, then it became very irregular. It was as likely to be one time of day as any other. I reset it several times, and then took it back for regulation. This experience I kept repeating for six months, the jeweler meanwhile declaring that the watch kept good time so long as it remained with him, and I fancy, suspecting that I did not keep it wound. At last, however, he took the watch and gave me another, which behaved precisely the same way. It may sometimes have run two weeks accurately, but very seldom more than two or three days. As an investigating experiment, I exchanged watches with a friend who had a perfect timekeeper. My watch was carried six weeks by this person, keeping accurate time during that period. In the meantime, the watch I borrowed lost time regularly, at the rate of half an hour in three or four days. This watch during the six weeks never behaved quite as erratically as mine, but it never kept good time while I carried it. I now have my own third watch, and am never able to keep it going more than a few days without finding it one, two, or three hours behind time. It must stop and start again, for it could not lose so much in so short a time, though it is always going when I examine it. I think it starts with the movement of looking at it. Since this experience my first watch has proved a satisfactory timekeeper in other hands. I inquired of a watchmaker, who assured me that there is a great difference in people in their capacity to carry watches and have them keep good time. He attributed it to the difference in the movements of the different people. This does not seem a plausible explanation, and if true, would not be satisfactory in this case, for my movements are less active than those of the person who carried my watch. I have met two people who claim that they have never been able to carry a watch, and have given it up. I am curious to know if there is any reason why I or any one should not be able to carry a watch, the watch being in good condition and kept wound, and if there be any cause, what it is. Can you give me any advice in regard to the matter? A. We have referred your statement regarding the change in the rate of a watch when different people carry it, to a wholesale dealer in watches in this city, and his reply is to the effect that it is not proved that the carriage of the person can affect the running of a watch. The difference in the stepping of one person and another is not sufficient to change the running of a watch appreciably, certainly not to the extent which you describe. The irregularity you ascribe to the watches is, by this good authority, considered to be due to the treatment of the watch in service. This is, in his opinion, irregularity in the time of winding as the most important; laying it down at night in different positions, sometimes on its back and sometimes on its face, and sometimes hanging it up in the pocket. These things make any watch irregular, no matter how good the watch may be.

NEW BOOKS, ETC.

THE PRACTICAL PHYSICS OF THE MODERN STEAM BOILER. By F. J. Rowan, A.M.I.C.E., M.I.E.S. Preface by R. H. Thurston. New York: D. Van Nostrand Company. 1903. 8vo. Pp. 638. Price $7.50.

The work is admirably illustrated by 314 engravings and describes the best modern practice. The literature on the mechanics of the steam boiler, such as the strength of materials, etc., is voluminous, so the present author has endeavored to take another path, as guided by the indications of physical research, toward the goal of a fuller understanding of the action involved in steam raising and of the requirements of efficient boilers.

ACETYLENE: THE PRINCIPLES OF ITS GENERATION AND USE. By F. H. Leeds, F.I.C., F.C.S., and W. J. Atkinson Butterfield, F.I.C., F.C.S. London: Charles Griffin & Co., Ltd. Philadelphia: J. B. Lippincott Company. 1903. 12mo. Pp. 276. Price $2.

The literature concerning acetylene is limited, so that a work of this kind is welcome. The author deals with the cost and advantages of acetylene lighting, the physics and chemistry of the reaction between carbide and water, the general principle of acetylene generation, selection of a generator, and the subsequent treatment of the gas, subsidiary apparatus, mains and service pipes, combustion of acetylene, incandescent burners, compressed and dissolved acetylene, the valuation and analysis of carbide.

SPRAYING CROPS: WHY, WHEN, AND HOW. By Clarence M. Weed, D.Sc. New York: Orange Judd Company. 1903. 16mo. Pp. 136. Price 50 cents.

This little manual has been prepared for the purpose of aiding owners of spraying machines to use them to the best advantage. The practical results of the most recent investigations and experiments have been embodied in it. The development of the practice of spraying crops furnishes a striking illustration of the practical results agriculture may derive from scientific investigation and accurate experimentation. The present is the fourth revised, rewritten, and enlarged edition.

ETAT ACTUEL DU LABOURAGE ELECTRIQUE. Par Emile Guarini. Paris: Publications du Journal Le Genie Civil. 1903. Pp. 16.

In this paper, which is a reprint from Le Genie Civil, Emile Guarini, well known to the readers of this journal as a contributor, very thoroughly examines the use of electricity in agriculture and shows just what the commercial possibilities of a system of electrical plowing are, basing his conclusions upon experiments actually carried out.

DIE EISENKONSTRUKTIONEN DER INGENIEUR-HOCHBAUTEN. Ein Lehrbuch zum Gebrauche an Technischen Hochschulen und in der Praxis. Von Max Foerster. Ergänzungsband zum Handbuche der Ingenieurwissenschaften. Leipzig: Verlag von Wilhelm Engelmann. 1903. Pp. 544. Price $12.50.

This is the second edition of a book which it was our pleasure to comment upon about a year ago. In that brief space of time the work has met with such marked success that a second edition has already become necessary. Naturally, the changes which have been made in civil engineering have not been so marked that a revision was at all necessary. The author has, therefore, confined his attention to a careful editing of certain of the sections, notably those treating of the behavior of iron structures when subjected to heat, forged iron columns, anchorages, and particularly those sections which treat of strains. The Hennebique process is now fully described, and also Mohrsch's calculation methods. The bibliography has been increased by the addition of references to articles in books which have appeared since the publication of the first edition. Additional figures are also to be found in the book. On the whole, the improvements which have been made have added to the excellence of a book, which should be of great value to the practitioner as well as to the student.

THE ART OF PATTERN MAKING. By I. McKim Chase, M.E. New York: John Wiley & Sons. 1903. 12mo. Pp. 254, 215 figures. Price $2.50.

A good book on pattern making is always welcome, and the volume before us will prove specially valuable to those who have occasion to make patterns for such objects as screw propellers, cylinders for marine engines, etc. The book will be of special value to students in technical and manual training schools. It is a book which we can heartily commend.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending November 17, 1903,

AND EACH BEARING THAT DATE

[See note at end of list about copies of these patents.]