Knitting machine, circular, E. A. Hirner..... 471,220

Business and Personal.

The charge for Insertion under this head is One Dollar a line for each insertion : about eight words to a line. Advertisements mu.t be received at publication office as early as Thursday morning to appear in the following week's issue

Wanted-50 second-hand screw-cutting lathes, 8 to 12" swing, either foot or steam power. Will pay cash. W. P. Davis, Rochester, N. Y.

Acme engine, 1 to 5 H. P. See adv. next issue. Wanted manufactured or will sell oil cup, page 21& "U.S. metal polish. Indianapolis. Samples free. Presses & Dies. Ferracute Macb. Co., Bridgeton, N. J. 6 Spindle Turret Drill Presses. A.D. Quint, Hartford, Ct. Patent Open-Side Planing and Shaping Machines.

Pedrick & Ayer, Philadelphia, Pa. For first-class patterns write to Chas. Cassell, general patternmaker, Canton, Ohio,

For foundrymen's metallic nattern letters and figure

send to H. W. Knight & Son, Seneca Falls, N. Y. Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Screw machines, milling machines, and drill presses The Garvin Mach. Co., Laight and Canal Sts., New York. Centrifugal Pumps for paper and pulp mills. Irrigating and sand pumping plants. Irvin Van Wie, Syracuse, N. Y.

For Sale-Eleven hundred acres best coal land on Pacific coast. For samples, etc., address C. F. Pearson, box 148. Portland, Oregon.

For Sale-Patent No. 463,912, issued Nov. 24, 1891. Tools for miners' and blasters' use. Address R. A. McVitty, Portland, Oregon.

Split Pulleys at Low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works, Drinker St., Philadelphia, Pa.

Convertible chair, cradle, and lounge. Patent for sale (No. 440,974), or wanted manufactured on royalty. Address F. A. Thomas, 149 Willoughby St., Brooklyn, N. Y. For the original Bogardus Universal Eccentric Mill. Foot and Power Presses Drills, Shears, etc., address J.S. & G. F. Simpson, 26 to 36 Rodney St., Brooklyn, N. Y. Good Investment-Half interest in lamp wick raiser

for flat wicks. Price, \$500. Patented Nov. 3, 1891. Particulars for stamp. M. A. McBride, M.D., Thomaston, What do you want to buy? We will send without cost to you, catalogues, price lists, and information concerns

ing anything you wish. Paret, Willey & Co., 265 Broad Competent persons who desire agencies for a new popular book, of ready sale, with handsome profit, may

apply to Munn & Co., Scientific American office, 36 Broadway, New York. A middle aged married man, a traveled salesman of

experience, now permanently located at Denver, Colo. (pop., 150,000), where he has extensive acquaintance, do sires agency of some Eastern or foreign specialty. Address Brewster & Co., Mendota Block, Denver, Colo.

The Hall & Cook post hole digger (see advertisemen page 220), patented U. S. Jan. 26, 1892, has won a brilliant place among its users in Canada. Already the Canadian Pacific Railway has adopted it, and the Grand Trunk Railway took its adoption into favorable consideration just as frost set in. It is beartily indorsed by Hon. John Dryden, Minister of Agriculture for Ontario, besides a host of farmers, etc., who have thoroughly tested it. Judging from the favor it bas already received with railway, telegraph and telephone companies, farmers, well and drain diggers, etc., it will be as indispensable as the spade bas been in the past.



HINTS TO CORRESPONDENTS.

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.

price.

Minerals sent for examination should be distinctly marked or labeled.

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(4207) C. M. M. asks if there is anything that can be put in water so that by heating a piece of cast steel and plunging it into the water it will come out annealed. A. There is nothing needed in the water for "water annealing." The process is simply to heat the steel to a low red heat and allow it to cool slowly in hot ashes until it looks black or the red heat is entirely gone, then plunge in water.

(4208) H. M. B. says: Two miles from the city of Quito in Ecuador, and 1,600 feet above its elevation, there is a waterfull that would fill a pipe 12 inches in diameter. If that water was piped down to the city in the best iron or steel piping, what thickness of pipe would be required at the lower end to withstand the strain? A. Wrought iron pipe 12 inches is amply strong, if about 16 inch thick. The pressure is too great for a city water supply. Extra strong plumbing will stand a water head of 200 feet, at which height a reservoir should be placed and the water brought to it by a free run through ordinary pipe with an overflow waste. This is far better than any attempt to rnn a high pressure servi

(4209) C. H. asks: 1. Is it necessary for one desirous of learning any of the type-setting or typecasting machines to first learn the art of setting type by hand? A. It is not absolutely necessary, if one knows Candles, ornamenting, T. V. Forster. 471,490 G. Wilcox. 471,490 G. Wilcox. 471,491 G. Wilc

how to punctuate, capitalize, paragraph, read difficult manuscript, etc., with the facility and correctness usually acquired by the compositor in learning to set type 2. Where is the Rogers typograph machine manufactured? A. Cleveland, Ohio. 3. Is it probable that a machine will be invented that will print short band characters as the ordinary type are printed by these machines? A. It would be as easy to print short hand characters as Roman, but there is no call for a machine

(4210) V. D. R. writes: 1. I am a student of the high school of this place, and in one of our experiments in chemistry we were directed to take a piece of sodium and hastily plunge it under the mouth of a test tube inverted in water in a larger dish. In about nine cases out of ten an explosion takes place. Will you kindly inform me through Notes and Queries the reason of the explosion, which does not occur when potassium is substituted for the sodium. A. This is a phenomenon of the spheroidal state. The heat is at first so great as to prevent full contact of sodium and water. When the heat falls and contact occurs the sudden heating produces an explosion. Potassium acts in the same way; neither should be used unless they are held under water. Both experiments are dangerous, 2. Also please give me equation for action in Leclanche cell. A. It may be written thus: Zn+2NH₄Cl=ZnCl₂+ 2H+2NH₃, but is undoubtedly complicated by other re actions. 3. Is it necessary to wind secondary coil of an induction coil in opposite direction to that of primary? If so, why? A. No. 4. Is there any gal vanic cell which has chloride of lime in porous cup with carbon and common salt in outer cup with zinc? If so, will you please give its E. M. F. in volts? A. You are thinking of Niaudet's battery. Plate of zinc in strong solution of common salt, porous cup containing plate of carbon and packed with chloride of lime and fragments of carbon. E. M. F. 1.65 running down to 1.5 volts. Resistance high, no action on open circuit.

(4211) F. L. W. asks: Can you tell me of a test that will indicate the presence of a very small percent of dissolved copper in water? Say one-tenth of a grain or less in a gallon of water. A. Excess of ammonium hydrate produces blue coloration in solution of copper. A very slight excess is enough. Possibly in your case it would be well to evaporate the water down in a porcelain dish or other vessel to about onetenth its volume, acidify, filter and add ammonia water. Add enough to react on litmus paper or to give a perceptible odor of ammonia.

TO INVENTORS.

An experience of forty years, and the preparation of more than one bundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequaled facilities for procuring patents everywhere. synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices which are low, in accordance with the times and our extensive facilities for conducting the business. MUNN & CO., office Scientific American, 361 Broad-

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Photographic films, machine for forming flexible, G. Bastman. Photographic shutter, Anthony & Lewis. Photographs, producing colored, J. W. McDonough. Piano, R. B. Watson. Pianos, tongue for stringless, T. Miller. Picture, magic, F. Tschofen. Pigments, manufacture of, G. W. Scollay. Pipe connection, W. Vanderman pipe corrugating machine, G. C. Keene. Pipe banger, J. Collis. Pipe wrench, A. L. Engelbach.	471,187 471,248 471,183
Picture, masic, F. Tschofen. Pigments, manufacture of, G. W. Scollay. Pipe connection, W. Vanderman.	471,305 471,147 471,247
ripe connection, w. vanderman, ripe corrugating machine, G. C. Keene. Pipe banger, J. Collis. Pipe wrench, A. L. Engelhach. Piperazin, making, W. Majert. Plane, carpenter's, O. Longval. Planers and shapers, to ol head for iron, F. W. & E. P. Parsons. Plow, C. C. Pields. Plow, D. J. Hill. Plow, B. Huenerjaeger. Pocketbooks, etc., frame for, A. W. Scheuber. Poke, animal, T. H. Sparks. Portfollo, C. M. Leonard. Press. See Glass press. Hay press. Printing press, Signature press. Printing press, L. W. Southgate. Printing press, L. W. Southgate. Printing press and folding machine, combined, L. C. Crowell.	471,348 471,471 471,520
Plane, carpenter's, O. Longval. Planers and shapers, tool head for iron, F. W. & E. P. Parsons.	471,391 471,189
Plow, C. C. Fields. Plow, D. J. Hill Plow, F. Huenerjaeger.	471,111 471,30 471,290
Pocketbooks, etc., frame for, A. W. Scheuber Poke, animal, T. H. Sparks. Portfolio, C. N. Leonard	471,144 471,149 471,390
press. Signature press. Pressure gauge, duplex, F. H. Haskell. Printing press, L. W. Southgate	471,383 471,403
Printing press, W. B. Yates. Printing press and folding machine, combined, L. C. Crowell. Printing press reciprocating mechanism, W. B. Yates.	471,368 471,102
Yates Propulsion of vessels, screw, E. J. Pahtz. Propulsion of vessels, screw, E. J. Pahtz. Protector. See Trunk protector. Pulley block, P. Freund. Pump, reciprocating, A. F. Abrahamson. Pump, rotary, J. Menge. Pump, rotary, B. F. Tahor. 471 279	471,369 471,274
Pulley block, P. Freund. Pump, reciprocating, A. F. Abrahamson. Pump, rotary, J. Menge. Pump, rotary, B. F. Taber. 471,279.	471,519 471,411 471,486 471,280
Pump, rotary, J. Menge	471,115 471,228 471,422
Railway conduit, electric, F. O. Blackwell	471,375 471,452 471,240 471,296
Puttying seams, implement for, J. Hawksley Pyrozyline varnish, R. Haie. Railway conduit, electric, F. O. Blackwell Railway, elevated, E. D. Wilson Railway signal, electric, E. T. Turney. Railway signal, electric, E. C. Wiley. Railway signal apparatus, electric, A. J. Wilson Son	471,230 471,410
Range attachment, J. F. Myers	471,222
Register. See Cash register. Regulator. See Temperature regulator. Thermostatic regulator.	111,120
mostatic regulator. Revolvers, barrel strap catch for, Foehl & Weeks Rock drill machine, W. Arnold Rock drill tripod, A. Ball Roller. Bee Friction roller.	471,112 471,331 471,300
for W.C. Westerrer	471 407
Ruler, V. M. Ariza. Sand box and axle collar, S. F. Welch. Sash fastener, M. Higgins.	471,459 471,365 471,118
Sash fastener. G. B. Sloan, Jr	471,363 471,241 471,159
Saw holding machine, S. W. Daly. Sawmill, gang, F. O. Kilgore. Saw set, J. M. Basket	471,168 471,125 471,461
Screw cutting machine, automatic, C. Rosine Screw, wood, H. K. Jones Section liner and protractor, combined, L. Miller.	471,194 471,179 471,428
Roofing, metallic, F. C. Robbins. Ruler, V. M. Ariza. Sand box and axle coliar, S. F. Welch. Sash tastener, M. Higg ins. Sash fastener, M. Higg ins. Sash fastener, G. B. Sloan, Jr. Sash holder, F. Keyser. Satchel strap, E. G. Wheeler. Saw bit. insertible, M. A. Howe. Saw holding machine, S. W. Daly. Sawmill, gang, F. O. Kligore. Saw set, J. M. Basket. Screw. cutting machine, automatic, C. Rosine. Screw. wood, H. K. Jones. Section liner and protractor, combined, L. Miller. Seeder, grain, S. H. Purdy. Separator. See Clay separator. Sewer trap, D. H. Donaldson. Se wingmachine, W. Y. Ober. Sewing machine operating attachment, M. L. Birdsong. Saxing reaching second bolder S. Whittier.	471105 471,494
sewing machine operating attachment, M. L. Birdsong. Sewing machine spool holder, S. Whittier	471,462 471,366 471,202
Sewig machine operating attachment, M. L. Birdsong. Sewing machine spool bolder, S. Whittier Sheet or band metal, making, Winlund & Larson. Shelf support, H. M. Hart. Shingle edging machine, H. E. Kingsley. Shoe fastening, N. P. Sjoberg. Shoes from squeaking, preventing, J. C. Gallagher. Shoulder breen G. W. Clerk	471,481 471,180 471,304
Shoes from squeaking, preventing, J. C. Gallagher. Shoulder brace, G. W. Clark. Shutter worker, Kraske & Noorm Ir	471,355 471,267 471 129
Sifter, coal, E. W. Humphreys Signal. See Rail way signal. Signature press, C. Seybold.	471,177
Shoes from squeaking, preventing, J. C. Gallagher Shoulder brace, G. W. Clark, Shutter worker, Kraske & Naerup, Jr. Siffer, cosl, E. W. Humphreys Signal. See Railway signal. Signature press, C. Seybold. Skate sharpener, J. Young, Shall arms, firing p. Tock for, J. D. Irvine. Solds ling machine, T. Bentley Solde ing machine, can, W. P. Quentell. Sole trimming machine, E. C. Moody. Spirometer, S. P. Lacey. Splini, P. F. Hanley. Spraying device, W. J. Ruff. Spring, See Bed spring. Vehicle spring. Steam boiler, O. D. Oryls.	471,164 471,122 471,231 471,360
Sole trimming machine, E. C. Moody. Spirometer, S. P. Lacey. Splint, P. F. Hanley.	471,394 471,389 471,252
Spraying device, W. J. Ruff. Spring. See Bed spring. Vehicle spring. Steam boiler, O. D. Orvis. Steam generator, W. N. Barrett. Steam trap, Renner & Hofbauer. Steering gear for vessels, R. J. Victor.	471,141 471,135 471,338
Steam trap, Renner & Hofbauer	471,397 471,200