#### Business and Personal.

The charge for Insertion under this head is One Dollar a lin for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue

20" combination wheel and lever drill. The best drill on the market for the money. Send for catalogue and prices. W. P. Davis, Rochester, N. Y.

"U.S." metal polish. Indianapolis. Samples free. Drop presses a specialty. Am. Tool Works, Clev., O. Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J. 6 Spindle Turret Drill Presses. A.D. Quint, Hartford, Ct. Best baling presses. RytherMfg. Co., Watertown, N.Y. G. D. Hiscox, 361 Broadway, N.Y., Consulting Engineer Portable and Stationary Cylinder Boring machines. Pedrick & Ayer, Philadelphia, Pa.

For Sale-Patent No. 342,617, poultry carver. Address for terms, Ligon & Allen, Sonora, Ky.

Tools for sheet metal goods, presses, lathes, dies, etc. Empire Machine and Tool Co., New Brunswick, N. J.

The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York. Screw machines, milling machines, and drill press The Garvin Mach. Co., Laight and Canal Sts., New York. For bridge erecting engines. J.S. Mundy, Newark, N.J. Centrifugal Pumps. Capacity, 100 to 40,000 gals, per minute. All sizes in stock. Irvin Van Wie, Syracuse, N.Y. Portable engines and boilers. Yacht engines and B. W. Payne & Sons, Elmira, N. Y., and 41 Dey Street, New York.

Guild & Garrison, Brooklyn, N. Y., manufacture steam pumps, vacuum pumps, vacuum apparatus, air pumps, acid blowers, filter press pumps, etc.

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

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### 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 This is for our information and not for publication.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.

Inquirles 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

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

Minerals sent for examination should be distinctly

(4532) W. J. P. asks: 1. Suppose a horse shoe steel magnet were substituted for the core of an electromagnet and a current of electricity were sent through the wire with which it was wound, would there be any limit to the strength which the magnet would attain? A. In this case a permanent magnet will becomestronger if the current is sent in a direction to favor the magnetism. On the other hand, it would be weaker if a current were sent in the opposite direction. and in all probability the polarity of the permanent magnet would be reversed. 2. Explain how four messages can be sent over one wire at the same time ! This quary connet be ensured in the ensure at command. You will find it described at length in Prescott's "Electricity and Electric Telegraph." 3 Will the lead foil with which tea chests are lined do for the plates of a secondary cell? What other metals besides lead can be used for the same? A. Lead foil will do for experiment, but it is not thick enough for practical use. 4. Please tell me how to make fulminate of mercury. A. You will find the method of mak ing fulminate of mercury described in almost every work on chemistry, but we advise you not to undertake it, as it is a very dangerous explosive. 5. Please ex plain the thermostat used in chicken hatchers. A. I generally consists of a compound thermostatic bar made of brass and steel brazed or riveted together and ar ranged to open and close dampers, or to regulate lamps either directly or through the medium of an

(4533) J. J. B. asks: 1. How can I obtain pure nitrate of silver from the coin? A. Dissolve the coin in nitric acid, evaporate to dryness, fuse, melt at a low heat, cool, dissolve and filter 2. How can l reduce the coin into pure metallic silver, suitable fo electroplating? A. Dissolve in nitric acid, precipitate with salt, filter, and wash, and reduce to metallic silver

electric current.

with dilute sulphuric acid and zinc. 3. Also nickel and ammonia double sulphate. A. This salt you can buy ready made. Or dissolve equal weights of ammonium sulphate and of nickel sulphate in water, evaporate and crystallize. 4. What are the acids of compounds and proportions used to make pure hydrochloric acid? A. Salt and sulphuric acid are caused to react on each other. For 47.5 parts sult, 98 parts of acid are needed. The gaseous hydrochloric acid is collected in water. 5. Is hydrocyanic acid (pruseic acid) expensive? If so please state if it would be cheaper to make it in small quantities than to purchase it ready made? A. The dilute acid costs \$1 per pound, the concentrated \$1.50. It is dreadfully poisonous, and its preparation is exceedingly dangerous, and should not be attempted except by a skilled person. 6. Is there any way that I can temper twist drills that have become untempered by heating while drilling? A. You can temper by ordinary methods, except that they may bend or spring when dipped.

(4534) O. A. J. asks (1) the melting point of bronze phosphor. A. About 1,692° Fah. 2. Are plaster of Paris moulds sufficiently good to cast bronze vokes for dynamo? A. Plaster of Paris will hardly answer for the moulds. You should use sand of the quality used by brass founders. 3. Please describe how I can melt the bronze in a forge. A. You can melt bronze in a forge by building up the fireplace a few inches with brick and making the fire deeper, place the bronze in a black lead crucible in the center of the fire and cover the crucible with a large piece of charcoal 4. What kind of wheel shall I use for water at 28 pounds pressure per half inch? A. For information on small high pressure water wheels we refer you to the catalogues of the manufacturers of such wheels

(4535) C. E. F.—Dirty type is generally cleaned by soaking it in cold lye for several days, after which it is washed with hot or cold water. This operation will clean the type but it will not make it as bright as new type. If the type sticks together, it should be soaked in weak ammonia, but if it is copper-faced ammonia cannot be used. It is to be separated by soak ing for about a week in weak lye. For thinning ink use inkaline, but anything that reduces the ink detracts from the efficiency. The sample of printing which you send to us is printed in the usual way, and after printing the work is embossed by means of a bronze stamp cut the reverse of the type. The counter dye can be made in several different ways. It is often made from leather, by taking a new belt leather, wetting it well and while it is soft gluing it on the press, then running the impression'up the center and letting it remain overnight. In the morning the leather will be hardened and the counter will be ready for use. The sheets are fed face, in in the usual way, without ink.

(4536) P. C. R. asks: How can the contents of a ball be obtained? A. For the contents of a ball or sphere, multiply the cube of the diameter by 0.5236. Why do some boats have their propellers partly out of the water? A. The boats are designed to have the propellers submerged at the deep load line. Is there anything gained by this? A. When light or partly loaded the propellers project above the surface of the water

Communications Received. Case of Hydrophobia in a Horse. By G. A. S.

### TO INVENTORS.

An experience of forty years, and the preparation of more than one hundred 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. As ynopsis 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. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

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. 482,430 . 482,337	Glove, tennis, C. C. Obear	Stove for heating ovens for japaning, enameli and glazing, T. M. Lincoln. Stove, oil, Bowman & Shaw.
. 482,626 . 482,388	Governors, sefety attachment for coming to 482,448 to 482,450	Stove, oil, Bowman & Shaw
. 482,667 . 482,696	Dean	Street sweeping machine, A. Voelkle Switch. See Railway switch. Table. See Extension table. Folding table.
. 482,696 . 482,401	Grate, shaking, C. E. Mark	Table. See Extension table. Folding table. Tank feeder, Burt & Skilton
. 482,453 . 482,391	Guns, cartridge holder for magazine, P. Mauser 482,376 Hame, W. H. Simmons	Tank feeder, Burt & Skilton.  Telegraph relay, W. Mayer, Jr. Testing device, strength, P. J. Dooling  Thermostat, adjustable, M. D. Compton  Thrashing mechane O. Anderson
. 482,524 . 482,477	Garter attachment, P. H. Flynn. 482,639 Gas burner attachment, G. Le Vesconte. 482,530 Gate. See Automatic gate. Fence gate. Gate, P. Johnson. 482,640 Glass cutting attachment, J. Urbanek. 482,601 Glass moulds, apparatus for mechanically operating, paste, M. J. Owens. 482,626 Glove, tennis, C. C. Obear. 482,647 Gold and silver from ores, composition of matter for the extraction of E. D. Kendall. 482,577 Governor, Hemphill & Fawell. 482,481 Governors, safety attachment for engine, F. W. Dean. 482,404 Grate, T. Henderson. 482,404 Grate, T. Henderson. 482,452 Grinder, J. E. Trawick. 482,452 Guns, cartridge holder for magazine, P. Mauser. 482,376 Hamger. See Door hanger. Harrows, planter attachment for disk, J. E. Gal-	Thermostat, adjustable, M. D. Compton Thrashing machine, O. Anderson
	Harrows, planter attachment for disk, J. E. Gal-   Larvester, corn, G. A. Farrall	Thrashing machine, J. N. Wilson
482,695	Hat ventilator, W. P. O'Connor	Thrashing machine and grain separator, continued, J. Galland Timepieces, bearing for balance staffs of, G. N
. 482,564	Hay rake, J. H. Thomas	Tire, prieumatic, L. J. Phelps. To oth, artificial, J. W. Moffitt.
482,596 482,612 482,543 482,529	Hay Stacking instance P. Bernard     52,679       Heating apparatus J. N. & E. N. Gates     482,679       Heating furnace, P. Kell, Jr.     482,581       Heel, A. Parkison     482,581       Holder, See Bag holder, Clothes holder. Fuse	Toy extension ladder, R. A. Booth
. 482,543 . 482,529 . 482 682	Holsting device, A. Olson. 482,641 Holsting device, A. Olson. 482,648 Holder See Bag holder Clothes builder English	Transportation system, L. F. Cook
. 482 682 . 482,454	Holder. See Bag holder. Clothes holder. Fuse and file holder. Sash holder. Hook and eye, H. C. Frank. 482,473 Horseshoe, C. A. Reade 482,650	Truck, lumber, A. T. Bemis.
. 482,479	Hose connections, machine for applying, A. M.	Type case and galley support, Hamilton & Kamann, Jr.
. 482,484 . 482,542	Smith 482,593 Hub attaching collar, vehicle, L. Faris 482,627 Hub attaching device, M. F. Deininger 482,571 Hub attaching device, M. F. Deininger 482,571	Typewriting machine, W. S. Edwards.
. 482,690	Hub attaching device, M. F. Deininger	Unloading vessels. cars, etc., device for, J. So
. 482,705 . 482,499		
. 482,604	other purposes, Jerdan & Broadbridge, Jr 482,362 Indicator. See Budder indicator.	Valve for set bowls, outlet, Thurston & How

6	Insecticide, J. J. Carter. Iron, manufacturing sheet, B. Talbot. Ironing board, E. R. Fowler. Ironing machine, F. D. Adams. Jack. See Lifting jack. Jewelry, H. Lehr. Kerf snreader, I. M. Kostar	482,403 482,396 482,348
3 1 1	Jack. See Lifting jack. Jewelry, H. Lehr	482,483 482,507
0 4 1	Jewelry, H. Lehr.  Kerf spreader, J. M. Foster.  Kuitting machine, C. J. Appleton  Lamp carbons, clamp for arc, A. Weber  Lamp, electric arc, Bigland & Burns  Lamp, electric arc, H. H. Cutler.  Lamp supports. line wire tightening device for electric, C. A. Pfluger.  Land roller, E. Geisendorfer	482,608 482,535 482,568
8	Lamp supports. line wire tightening device for	482,435 482,486
5 6 9	Lantern, Baron & Cockayne	482,406 482,671 482,349 482,482
8 0	Latch, gate, C. M. Lamb Leather, process of and apparatus for degreasing, F. N. Turney Lifting jack. Fisher & Perry Lighting device, B. H. Pendleton. Lock. See Carriage lock.	482,661 482,628
§ 6 5		482,587 482,594
5 9 3		482,393 482,446
5 8 9	for, B. F. Stockford.  Loom for weaving tufted fabrics, H. Dixon.  Loss by accident, means for insuring travelers against. E. N. Hill (r).  Lounge. W. S. Bowle	11,270 482,673 482,674
9	Lubricator. See Axle lubricator. Lubricator, M. H. Fine	482,346
0 4 7	Lubricator, Martin & Brownfield Lubricator, A. Ness. Mangle, C. A. Oveson Mangle, steam, F. Baldwin.	482,559 482,560 482,410 482,609 482,333
5 5 7	Mangle, Steam, F. Baldwin, Mangle, steam, F. Baldwin, Mannel, adjustable, E. B. Benbow, Masonry, pointing mechanism for, E. K. Kruck Matol safe, M. R. Land Mechanical movement, H. D. Mentzel (r)	482,333 482,369 482,371 11,271
5 8 7	Mechanical movement, H. D. Mentzel (r)	11,271 482,489 482.364
9 5	Mother-of-pearl articles and making the same, Eckert & Cohen Motion, device for converting, Morrison & Dye,	482,548
2 4 6 7	Motto plate, C. M. Underwood	482,584 482,662
0		482,347 482,432 482,442
3 1	Muff, C. C. Ashbaugh Musical notation, J. W. Robberson Nail extractor, M. D. Converse. Nailing implement, band, W. J. Brown Necktie or band, C. S. Cole. Net, dip, F. Hanish Net, fly, G. Sollenberger Nitroglycerine from waste acids, recovering, J. Lawrence.	482,338 482,540 482,547 482,635
3	Net, fly, G. Sollenberger	482,417
1 2 1 1 9	Lawrence Nut and bolt lock, T. A. Flanigan Nut lock, J. Bender Nut lock, W. Cokay e.	482,472 482,610 482,518
2	Oil burning apparatus, G. H. Harvey Oil can, lamp filling, J. Geary Oil extracting apparatus, C. Mann	482,508 482,680 482,581
3 4	Nut and bolt lock, T. A. Flanigan.  Nut lock, J. Bender.  Nut lock, W. Cokay e.  Oil burning apparatus, G. H. Harvey.  Oil can, lamp filling, J. Geary.  Oil extracting apparatus, C. Mann.  Oil purifier and reservoir, R. Metz.  Ore crus her and grinder, N. F. Acers  Ore washing machine feeding device, C. A. E.  Meinicke.	482,330 482,330
598	Pan. See Frying pan.	482,455 482,480
2	Pen, fountain, L. A. Shattuck. Pencil clasp, E. W. Mildrum. Pianos, stringing, C. S. Weber.	482,592 482,409 482,512
3	Pin. See Clothes pin. Pineapples, machine for treating, G. W. Zastrow.	482,493
10 12 12	Pipe wrench, D. R. Porter. Planing machine, A. B. Hutchinson. Plank, walk and bridge, A. Zagelmeyer. Planter, check row S. B. Sare. Plow attachment, C. H. Warrington. Plow, double mould board, C. E. Parks. Plow fender, G. N. Spencer. Plow standard and attachment, W. T. Stapler. Pole, coupling A. Drew Poet, Son Woo, A. Drew	482,481 482,536 482,437
1	Plow, double mould board, C. E. Parks	482,380 482,595 482,510
8	Dot See Fleeting not	482,678
8567	ism, W. S. Huson	482,359
04	Pump, W. Peterson Pump, A. Siehert. Pump, double-peting G. J. Noth	482,619 482,586 482,416 482,692
00	Pump, A. Siehert. Pump, double-acti g, G. J. Neth. Pump, portablegarden or spraying, G. D. Hamb- lining and shearing machine, F. N. Helfrich Rack. See Wagon rack. Railway coach. M. Goetze.	482,681 482,356
4	Rack. See Wagon rack. Railway coach. M. Goetze	482, <b>6</b> 34 482,352
9 39 38 36	Railway coach, M. Goetze.  Railway crossing, E. B. Gibson.  Railway crossing protector, R. J. M. Danley,  Railway switch, street, T. L. Johnson.  Railway time signel W. Scott	482,423 482,426
15	Railway switch, street, T. L. Johnson	100,000
0	R R	193.703 431 (50
18	R	462, 18 182,42?
4 66	St 11.7	4×2 5.77
34	Saw tuing macuine, T. S. Disston. Saw gummer, stave, A. Scamahorn. Saw setting machine, F. J. Drake. Sawing machine, A. Rodgers, Sr. Scaffold, J. Dunbar. Scraper, earth, J. D. Brainard. Scraper, wheeled, C. Rath. Screen. See Coal scuttle screen. Seats, reversible back for car or other. M. N. Forseats, reversible back for car or other. M. N. Forseats, reversible back for car or other.	482,386 482,624 482,679
37	Scaffold, J. Dunbar	482,625 482,711 482,414
7 17 59	Screen. See Coal scuttle screen. Seats, reversible back for car or other, M. N. Forney	482,447
0 36 79 15	Sea is, reversible back for car or other, M. N. Forney. Sectional boiler, cast from H. A. Smith. Seeder, F. A. Crane. Separator, A. A. Goubert. Sewerage system, pneumatic, C. T. Liernur.	482,657 482,470 482,354 482,439
54 11 39	Sewing machine quilting attachment, J. W. Clay-	482 467
)1 25	Shade rollers, spindle tip for spring, Perkins & Leigh Leigh Leigh Shafts, bending vehicle, O. A. Goldsworthy. Shafts, vehicle, W. R. Cullison Shavings washing machine, R. H. Herder. Shelf, banging window, W. A. Thompson Shoe, E. McDonald Shutter worker, J. S. Patten Sifter, A. Charlesworth. Sifter, flour, I. M. Ingram. Sifter, flour, I. M. Ingram. Sifter, hand, J. R. Storie. Signal. See Railway time signal. Spirometer, H. G. Cady. Spring. See Vehicle spring. Stairbuilder's tool, W. T. Gagnebin. Stand for beer glasses, etc., E. Weigel. Stapling implement, G. Hay. Steam boiler, M. H. Plunkett. Steam boiler, M. H. Plunkett. Steam boiler, M. H. Plunkett. Steam or tempering grain, device for, R. L.	482,563 482,475 482,471
30 24 78	Shavings washing machine, R. H. Herder	482,684 482,502 482,456
58	Sifter, J. Charlesworth Sifter, flour, I. M. Ingram. Sifter, hand, J. R. Storie	482,545 482,576 482,576
33	Signal. See Railway time signal. Spirometer, H. G. Cady Spring. See Vehicle spring.	482,336
5 33	Stairbuilder's tool, W. T. Gagnebin Stand for beer glasses, etc., E. Weigel Stapling implement, G. Hay	482,350 482,603 482,357
5875	Steam boiler, M. H. Plunkett. Steam boiler, J. Pollock. Steaming or tempering grain, device for, R. L.	482,384 482,459
30 40	Rodman. Step, movable, F. Forster Stone, composition of matter forartificial, Kesel- ing & Fuchs. Jr.	482,590 482,573 482,367
)1 26	ing & Fuchs, Jr. Stool, P. H. Fuhrmann. Store service apparatus. C. W. McCormick. Stove and furnace, combined, C. Brandt	
17	stove for neating ovens for japaning, enameling, and glazing, T. M. Lincoln	482,485 482,539
50 04	Straw stacker, L. D. Wells.	482,513
56 52 00 76	Table. See Extension table. Folding table. Tank feeder, Burt & Skilton. Telegraph relay, W. Maver, Jr	482,617 482,440
56	Street sweeping machine, A. Voerke. Switch. See Railway switch. Table. See Extension table. Folding table. Tank feeder, Burt & Skilton. Telegraph relay, W. Mayer, Jr. Testing device, strength, P. J. Dooling. Thermostat, adjustable, M. D. Compton. Thrashing machine, O. Anderson. Thrashing machine, O. M. Wilson. Thrashing machine, and grain separator com-	482,623 482,420 482,494
32 51 41 29	Thrashing machine, J. N. Wilson. Thrashing machine and grain separator, combined, J. Galland. Timepieces, bearing for balance staffs of, G. New-	482,709 482,554
29 12 32 11	Tire, pneumatic, L. J. Phelps.	482,585 482,487 482,377
79 63 61	Toy extension ladder, R. A. Booth. Traction engine, I. Townsend. Transfer sbeet, F. Koskul. Transportation system, L. F. Cook. Trolley, underground, J. Fischer. Truck, lumber, A. T. Bemis. Tube cutter, M. C. Coppage. Type case and galley support, Hamilton & Kaufman, Jr.	482,40°2 482,599 482,451
48	Transportation system, L. F. Cook.  Trolley, underground, J. Fischer.  Truck, lumber, A. T. Bemis.	482,469 482,500 482,333
73 50	Type case and galley support, Hamilton & Kauf-	482,496
u2	mann, Jr	482,522 482,361
93 27 71 18	mann, Jr. Typewriter counter, F. W. Jones. Typewriting machine, B. Granville. Typewritind machine, B. Granville. Unloading vessels. cars etc., device for, J. Socci.	482,522 482,519 482,521 482,521