feet fire surface. 3. Used for house heating how many square feet of radiating surface should above boiler supply to advantage? A. About 600 feet.

(26) B. & A. Co. write: We have two shafts running 1¼ inch to the foot out of line, with two pulleys attached, 36 inches diameter, 10 inch face, run by an upright belt, and the belt in running runs off both pulleys on the same side 1½ to 2 inches; both pulleys are turned the usual way crowning, and running at a speed of two hundred revolutions a minute. What we wish to know is, if we have one or both pulleys made a little crowning off the center, will it lead the belt on straight, and would we get full power of belt; and if we should make them doubly as crowning would it make any difference? A. Crowning will do no good. Your only mode of correcting the evil is to so place carrier pulleys or oilers, that the belt shall run on both pulleys at right angles to their respective shafts.

(27) C. S. writes: I bought SUPPLEMENT, 142, in view of constructing me a telephone for a private line. But there are several points I would inquire further about. 1. Should the ends of the coil wire wound around the spool touch the connection wire fastened in the binding post? A. Yes. 2. How can I tell the like poles on magnets? A. Present the poles to a compass needle. Poles that produce the same effect are alike. 3. Would common tin do for the diaphragm, or what other material should I use? A. Tin is too thick. Use ferrotype plates. 4. Should I use No. 36 common copper wire for connecting the instrument with another? A. Use No. 12 iron wire for your line.

(28) A. S. R. asks (1) for information on melting and pouring caoutchouc. A. Caoutchouc cannot be melted and poured as you suggest. When heated to the fusing point it suffers partial decomposition. 2. Is there a work published on the manufacture of Indian arrow heads? A. We know of no book on this subject.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

T. H. B.—1. Marmolite. 2. Hornblende in quartz. 3. Dolerite. 4. Feldspar and hornblende. 5. Chiefly quartz. 6. Hornblende. 7. Sandstone and lime carbonate.—S. W.—1. Heavyspar—barium sulphate. 2. Limonite on quartz. 3. Gypsum. 4. Ferruginous lime sulphate (deposit). 5. Pyroxene. 6. Chrysocolla. 7. Graphite in sandstone. 8. Chiefly quartz and limonite. 9. Limonite on quartz.—N. O. G.—It is tourmaline (hardness 7·5—corundum is 9, diamond 10).—E. G.—The powder contains traces of gold—hardly rich enough to pay.—J. M. S.—The small pebble (one) is quartz—not diamond.—T. C. Y.—Your ink, where not used in excess is easily removed.—T. F. W.—Iron, copper, and molybdenum sulphides. It may carry gold, but it will require a fire assay to determine this.—L. H. G.—The rock contains much titaniferous iron ore. Some of it may carry gold. An assay would be advisable.

COMMUNICATIONS RECEIVED.

On a Brilliant Meteor. By C. E. S.

On the Operation of Arsenic and How to Detect Carbonic Oxide. By H. M. D.

NEW BOOKS AND PUBLICATIONS.

ZEITSCHRIFT FUR INSTRUMENTENKUNE (JOURNAL OF SCIENTIFIC INSTRUMENTS). Edited by Dr. G. Schwirkus. Berlin: 1881. Julius Springer.

This monthly publication, the first number of which is now before us, is devoted to scientific instruments and the experiments therewith. Each number will contain illustrations and descriptions of the modern scientific instruments, the opinions of scientific men in regard to the same, and all possible improvements and observations in manufacturing the instruments will be given, so as to enable one manufacturer to profit by the experience of others, whereby the accuracy of scientific instruments in general will be greatly improved. All patents for scientific instruments will also receive proper notice. The leading savants of Germany, such as Messrs. C. Bruhns, of Leipsic; Bauernfeud, of Munich; v. Lang, of Vienna, and many others contribute to this work. The first number contains articles by Fuess, on Normal Barometer; Illuminating Micrometer Devices, by Foerster; Micrometer Screws, by Reichel; Vogel and Lohse, on Spectral Apparatus; Kronecker, on Graphical Methods in Physiology, etc. This work is printed in clear English type.

PROYECTO DE ORGANIZATION DE LA SECCION DE ESTUDIOS DEL ATENEO DEL URUGUAY. Por el Doctor F. A. Berra. Montevideo: 1880.

This volume of over 250 octavo pages is an elaborate plan for a total reorganization of the course of studies now pursued at the Atheneum of Uruguay. It seems that these studies have hitherto been quite elementary—just enough to give the student sufficient education to qualify him for business, but not enough to fit him to become a prominent member of society or even to qualify him for the duties of a public life. The consequence is that the administration of the government falls into the hands of a few privileged persons. This state of things for a republic is justly considered radically wrong by the promoters of the project under consideration. Hence the elaboration of a plan to give all the youths of the nation a liberal education which shall make them ornaments of society and good citizens, who shall be capable, when their country calls upon them, of filling any public office to which they shall be elected. The proposed course of instruction here laid down seems to be quite elaborate, and equal to that found in the curriculum of any prominent college or university. Dr. Berra and his associates are to be wished all success in their noble and patriotic undertaking.

THE MAGAZINE OF ART. Cassell, Petter, Galpin & Co. New York.

The March number of this entertaining art publication has made its appearance, and, like the preceding numbers, it is full of illustrations, and complete in interest to all lovers of art in varied departments.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

March 1, 1881,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, will be furnished from this office for one dollar. In ordering please state the number and date of the patent desired and remit to Munn & Co., 37 Park Row, New York city. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications not being printed, must be copied by hand.

Air compressor, H. F. Fitzpatrick 238,374
Air compressor, hydraulic, W. R. Freeman 238,225
Atomizing tube, flexible, I. Heine 238,368
Awning fitting, T. Williams 238,265
Axle box, car, E. R. Esmond 238,280
Axle box, car, G. J. Maxwell 238,242
Axle, wagon, S. G. Mason 238,299
Bale ties, machine for splicing or connecting, L. Miller 238,417
Barrel for holding cranberries, etc., J. Collins 238,215
Barrel head, F. G. Johnson 238,397
Bed bottom, sprine, Creager & Burdick 238,216
Bed bottom, spring, R. Stilwell 238,476
Bedstead attachment, G. G. Gibson 238,282
Bell, door, J. W. Johnson 238,398
Belt clamp, waist, J. E. Parsons 238,247
Belt connection, M. Schulze 238,443
Belting, G. A. Ambler 238,200
Bicycle luggage carrier, F. Morris 238,245
Billiard table, S. May 238,414
Binder's reel, Konold & Deming 238,403
Blind slat adjuster, Pierson & Hill 238,309
Boiler furnace, steam, A. L. Holley 238,235
Boot and shoe, J. A. Safford 238,312
Boot and shoe heel burnishing tool, Z. Beaudry 238,206
Boot and shoe heel plate, S. Crowley 238,362
Boot and shoe heels, machine for shaving and breasting, B. J. Tayman 238,456
Boot and shoe sole edges, rotary cutter for trimming, W. D. Orcutt 238,303
Boot and shoe stretcher, Couch & Glines 238,357
Boot and shoe soles, metallic plate for, W. A. Ingalls 238,394
Boots and shoes, removable sole for, W. Sachs 238,441
Bottle washer, J. M. Hoyt 238,289
Bottle washer, C. Pease 238,306
Brush, G. A. Scott 238,444
Buckle, ornamental bridle, T. Noble 238,426
Buffing pad, A. Andrén 238,201
Buggy body, S. A. Nolen 238,246
Buggy top attachment, E. N. Heney 238,286
Button, detachable, W. P. Dolloff 238,368
Button or stud, Burdon & Brown 238,342
Cabinet, J. Sorenson 238,452
Can, T. G. F. Dolby 238,218
Can heading machine, W. J. Clark 238,351
Can opener, J. J. Henry 238,288
Cans, closing metal, J. Broughton 238,338
Car brake, G. Brenner 238,211
Car brake, H. Gallager 238,379
Car coupling, Arter & Blocher 238,325
Car coupling, E. Delira, Jr. 238,364
Car coupling, S. Nichols 238,423
Car coupling, T. Noble 238,425
Car coupling, M. C. Quimby 238,433
Car door fastening, J. B. Calkins 238,344
Car, railway, C. M. Kimball 238,239
Car, sleeping, J. H. Doerr 238,367
Car, sleeping, F. W. Hunter 238,236
Car, sleeping, T. T. Woodruff 238,470
Car, stock, W. F. Mitchell 238,243
Car, stock, T. Noble 238,424
Car, stock, A. F. S. Osterburg 238,304
Car, strawberry, A. H. Fogg 238,223
Car wheel, R. N. Allen 238,475
Car wheel and axle, O. T. Southworth 238,257
Cars, life guard or wheel guard for street, J. Stephenson 238,258
Carburetor, J. T. Guthrie 238,386
Carpet sweeper, C. O. Allen 238,321
Cartridge shells, machine for drawing, A. C. Hobbs (r) 9,594
Carving fork, C. L. Butler 238,276
Caster, W. C. Coddington 238,355
Cerate, S. E. Hyndman 238,237
Chain, ornamental, E. A. Jenks 238,396
Chain swivel, watch, J. Homer 238,391
Cheese vat, T. B. Wire 238,319
Churn, E. S. Gibbs 238,228
Clevis, plow, I. R. Gilbert 238,384
Clipper, hair, G. H. Coates 238,353
Clock, electric, A. Personne 238,428
Clock pendulum, E. Horton 238,392
Clothes prop, G. O. Lackey 238,404
Coffin handle, C. A. Bailey 238,328
Coffins of clay, etc., manufacture of, W. H. Bachtel 238,268
Cooker, steam, T. J. Whitney 238,264
Corn husks, etc., machine for disintegrating, W. A. Wright 238,472
Corrugating machine, W. Wilson, Jr. 238,468
Cotton and hay press, Cory & Holland 238,356
Crane, steam, W. H. Ridgway 238,438
Cruppers, process of and machinery for making, J. Shaffer 238,446
Culinary pot, W. N. Barrows 238,272
Currycomb, W. E. Lawrence 238,297
Curtain cord tightener, T. Arndt 238,202
Cylindrical bodies, device for swaging, C. B. Morse 238,421
Damper, C. E. Sutphen 238,259
Damper regulator for furnaces, D. C. Kellem (r) 9,590
Digging and grading machine, J. M. Caraway 238,346
Door hanging, sliding, E. Prescott 238,310
Doubletree attachment, C. F. W. Goernandt 238,229
Draught equalizer, L. O. Brekke 238,337
Drilling machine, T. R. Morgan 238,244
Dyers' and bleachers' shells, tool for coring, R. Bell 238,207
Dumb waiters, fan attachment for, J. W. Pettengill 238,429
Earring, G. W. Washburn 238,318
Earthenware vessel handle, H. Mishler 238,420
Egg beater and mixer for kitchen use, H. Howson, Jr. 238,393
Electric machines, current regulator for dynamo, Thomson & Houston 238,315
Eyeglass supporter, F. A. Hardy 238,285
Fan, sun shade, J. H. Dennis 238,365
Faucet, H. Mattullath 238,300
Faucet attachment, J. P. Gruber 238,232
Feed trough and hay rack, J. M. Holladay 238,390
Felt hardening machine, Yule & Yocom 238,267
Fence, W. Churchman 238,348
Fence barb, wire, M. C. Shinn 238,447
Fence, barbed wire, T. Shuman 238,255
Fence post, P. Coughlin 238,358
Fencing, barbed metallic, G. W. Kirchhöffer 238,296
Fertilizer, J. M. & J. Lippincott 238,240
Field roller, Blackford & Reno 238,208
Fifth wheel, vehicle, Campbell & Neider 238,345
Filter for water service mains, J. H. Barnes 238,330
Fire escape ladder, S. Torrance 238,460
Flax brake, W. A. Wright 238,266
Flue for furnace registers, supplemental, C. H. Fifield 238,222
Gas burner, J. F. Barker 238,205
Gas governor, W. Cowan 238,359
Gas lighter, electrical, C. D. P. Gibson 238,383
Gas lighting and extinguishing device, automatic, J. M. Foster 238,377
Gas, manufacture of illuminating, A. W. Wilkinson (r) 9,595
Gas regulating burner, H. W. Rappleye 238,435
Gas regulator, J. M. Foster 238,375
Gas works, door frame for retort benches of, A. H. Lowell 238,411
Glove, H. Urwick 238,262
Governor, marine engine, W. Würdemann 238,473
Grain binder, J. Augspurger 238,327
Grain binder, A. Goodyear 238,230
Grain binder, F. Ogden 238,302
Grain binder, J. D. Reed 238,435
Grain binder, automatic, S. V. Essick 238,371
Grain binder tension, W. R. Coats 238,354
Grappling bucket, F. G. Johnson 238,293
Grate, fire, C. W. Doten 238,219
Grinding machine, W. H. Doane 238,366
Grinding mill, J. S. Tarr 238,260
Hame attachment, W. O. Miller 238,418
Harrow, C. Tolle 238,458
Heating buildings, apparatus for, E. A. Wood 238,469
Hinge, E. G. Adams 238,320
Hoop cutting machine, F. L. Wilson 238,467
Hop picking machine, H. G. Locke 238,409
Hose coupling, D. B. Kendall 238,294
Hose sprinkler, J. W. Killam 238,295
Hydrant, H. Robinson 238,311
Invoice or scrap book, T. Hartung 238,233
King bolt, T. Graser 238,283
Kitchen boiler, G. Salmon 238,442
Lacing hooks, machine for setting, M. Bray 238,335
Lacing studs or hooks, machine for setting, M. Bray 238,336
Lamp, F. G. Palmer (r) 9,592
Lamp, W. H. Smith 238,450
Lamp extinguisher, W. H. Kittle 238,402
Lamp, lime light, A. M. Khotinsky 238,400
Lamp, safety, M. A. Heath 238,234
Lathes, mechanism for operating the slide rests of, W. Sellers 238,254
Leather, artificial, C. A. Evans 238,372
Leather, manufacture of, C. Heinzerling 238,389
Lifting jack, A. Garrison 238,380
Lock strike, H. Fellows 238,373
Locomotive, C. B. Clark 238,349
Locomotive saddle and stack, A. Berney 238,273
Lumber sorter, E. T. Davies 238,220
Magnet and magnetic telephone, S. Russell 238,252
Magneto-electric signaling apparatus, J. S. Brown 238,212
Malt in brewing, etc., treatment of starch and starchy substances, and the production therefrom of a compound used as a substitute for, Sullivan & Valentin 238,474
Meat safe and smoker, F. M. Woods 238,471
Middlings purifier, A. H. Kirk 238,401
Milk and preserve jar, F. Henry 238,287
Milk, preparation of sour, C. Peck 238,248
Millstone, J. Y. Trammell 238,461
Millstone dress, B. C. Lambeth 238,405
Millstone spindles, apparatus for driving, S. Potts 238,432
Mosquito bar, revolving, E. Solomons 238,313
Mower, lawn, Mast & Martin 238,412
Musical box, D. Aubert 238,326
Musical instrument, mechanical, M. J. Matthews 238,413
Nursery chair, E. S. French 238,226
Nut lock, J. W. Bunker 238,340
Ore drying furnace, C. Stetfeldt 238,455
Oxidation furnace, G. W. Baker 238,270
Oyster car, E. H. Frazier 238,378
Painting on velvet in oil colors, L. Farquharson 238,221
Pantaloons, reversible, L. M. Brock 238,275
Pants stretcher, C. C. Chase 238,347
Paper and manufacturing the same, M. Newton 238,422
Paper, making wood pulp for, H. H. Furbish 238,227
Paper pulp, machine for making frames or casings for lamps from, Stevens & Chisholm (r) 9,593
Paper tube machine, A. Tillmes 238,457
Perfumes of natural flowers by absorption, obtaining, R. A. Chesebrough 238,277
Piano action, M. J. Chase 238,214
Piano coupling, J. M. Foster 238,376
Pipe coupling, G. H. Reynolds *et al.* 238,437
Plaiting machine, C. Clark 238,350
Planters, coupling stop and wire for check row, J. C. Dupee 238,370
Pole tip, I. R. Gilbert 238,385
Press, T. A. Watrous 238,463
Printing machine, chromatic, T. B. Dooley 238,278
Pump and sprinkler, A. J. Polansky 238,430
Pump, portable force, S. Bonser 238,333
Rake, W. S. Pickett 238,249
Refrigerating apparatus, air, T. B. Lightfoot 238,408
Refrigerating cover, portable, A. C. Pecor 238,307
Refrigerator, P. Balz 238,204
Road or tramway for vehicles, T. S. Mills 238,419
Rolling iron, method of and apparatus for, M. V. Smith 238,449
Rub rolls, hanging and driving device for, J. Barker 238,329
Sand paper roll, H. L. Hapgood 238,284
Sash cord fastener, W. H. Day 238,363
Sash fastener, W. Tyler 238,462
Saw gummer, gin, J. B. Clopton 238,352
Scarf, neck, W. A. Laverty 238,406
Scoop, wooden, E. P. Phillips 238,308
Sewing, book, D. M. Smyth 238,451
Sewing machine spinning attachm't, J. C. Blackett 238,332
Shaft coupling, J. State 238,454
Shawl strap, M. Rubin 238,440
Silo, L. H. Whitney 238,465
Smoke and gas consuming furnace, W. D. Smith 238,256
Snap hook, A. N. Bragg 238,259
Soap, A. C. Selby 238,445
Soldering apparatus, N. Jenkins 238,291
Soldering machine, automatic, J. A. Forbes 238,224
Spectacle frame, J. L. Borsch 238,274
Spokes and fellies, machine for tenoning and boring, M. P. Ellison 238,279
Stamp, canceling, D. C. Breed 238,210
Staples for fences, machine for forming, W. D. Brown 238,339
Steam engine, compound, M. MacMahon 238,241
Steering apparatus, steam, G. W. Baird 238,269
Stove L. F. Betts 238,331
Stove burner, gas, A. W. Morton 238,301
Stove lamp, J. H. Irwin 238,395
Stove leg, J. McMaster 238,415
Suspenders, W. G. Anderson 238,323
Telegraph, duplex, G. Smith 238,448
Telegraph, dynamo-electric, O. Lugo 238,298
Telegraph mechanism, S. M. Plush 238,250
Telephone, electric, S. Russell 238,253
Telephone exchanges, pole changer for, E. P. Warner 238,263
Telephone relay, C. T. Tomkins 238,459
Telephone signaling apparatus, G. W. Coy 238,360
Telephone switch board, T. De Lockwood 238,217
Telephone systems, circuit charger for district, G. W. Coy 238,361
Telephone systems, shunt for speaking, F. W. Jones 238,399
Telephonic transmitter, C. A. Randall 238,434
Testicle support for stallions, S. Taylor 238,261
Thill coupling, A. Walter 238,316
Tool holder, J. F. Allen 238,322
Tooth crown, artificial, W. G. A. Bonwill 238,334
Tooth crown, artificial, W. H. Gates 238,382
Torch, J. A. McPherson (r) 9,591
Toy cymbal, J. White 238,465
Trimming, M. Lowenstein 238,410
Truck, locomotive, J. Apsey 238,324
Trunk clamp, J. J. Feth 238,281
Tube skelps, device for handling, W. C. Allison 238,199
Type writer, T. Hall 238,387
Umbrella, P. A. Meurgey 238,416
Umbrella, parasol, etc., C. C. Juif 238,238
Vehicle seat fastener, G. Ward 238,317
Vehicle spring, S. Palmatier 238,427
Vent for beer kegs, automatic air, J. B. Gruber 238,231
Ventilating and cooling buildings, E. E. Rice 238,251
Voting machine, A. M. Stephens 238,314
Washing clothes, device for, J. B. Calkins 238,213
Washing machine, S. Parks 238,305
Watch, chronograph, J. S. Aubert 238,203
Watch, stem winding, P. H. Wheeler 238,464
Water closet valves, mechanism for operating, J. H. Spencer 238,453
Water supply for cities, C. H. Roberts 238,439
Window, bay, W. S. Garrison 238,381
Wood preserving compound, W. W. Bunnell 238,341
Wood, stone, etc., machine for dressing, N. Jenkins 238,290
Wood, stone, etc., machinery for dressing or shaping, N. Jenkins 238,292
Wrench, B. Donohue 238,369
Wrench, combination, Butler & Campbell 238,343
Wringing machine, R. G. Baldwin 238,211

DESIGNS.

Carpet border, Chambellan & Magee 12,181
Jewelry, J. F. Chatellier 12,180

TRADE MARKS.

Blacking, shoe, C. Leroy 8,183
Cigars, cigarettes, and chewing and smoking tobacco, D. E. Rose 8,184
Cigars, cigarettes, and smoking and chewing tobacco, S. Hernsheim & Brother 8,181, 8,182
Corsets, ladies', L. Schiele & Co. 8,190
Explosive compound, Thunder Powder Company 8,187
Flour, wheaten, Lyon, Dupuy & Co. .... 8,177 to 8,180
Paper of all kinds, writing, Hard & Parsons 8,189
Spices (ground), flavoring extracts, salad dressing, and sauces, E. R. Durkee & Co. 8,188
Tobacco, cigars, cigarettes, and snuff, smoking and chewing, C. W. Allen 8,176
Tobacco, fine-cut, smoking, and plug chewing, C. W. Allen 8,175
Watch, L. Strasburger & Co 8,185, 8,186

English Patents Issued to Americans.

From February 25 to March 1, 1881, inclusive.

Compass, needles for, J. Lewis *et al.*, Mass.
Compound for treating iron, A. H. Siegfried *et al.*, Selins Grove, Pa.
Electric lamp, T. A. Edison, Menlo Park, N. J.
Electric lamp, T. A. Edison, Menlo Park, N. J.
Hydrocarbon furnace, B. Sloper *et al.*, Washington, D. C.
Illuminating, E. B. Reynolds, Cleveland, Ohio.
Packing box machinery, F. Myers, N. Y.
Paper drying machinery, L. A. Turner, Chicago, Ill.
Paper punching machinery, Automatic Music Paper Company, Boston, Mass.
Paving cement, E. J. de Smedt *et al.*, Washington, D. C.
Printing press, E. B. Welch, Cambridge, Mass.
Printing press, W. H. Golding, Chelsea, Mass.
Sewing machine, J. M. Fair, Buffalo, N. Y.
Telephone, J. Goodman, Louisville, Ky.
Type writer, T. Hall, New York city.