of air. It is singular to us how a patent was obtained on the safe.

"A. H. of Me."—We have replied to your last, by mail, I hope it will be satisfactory but if it is not, institute inquiry of the commissioner of patents and he will corroborate our statement.

"A. P. of N. Y."—Your letter of the 3d inst. is at hand, and we shall proceed to making out your papers in a few days.

"S. H. of N. Y."—We cannot supply you with No. 34, as the demand for that No. has been so great that we are out of them.

"L. R. of Del."—The notice to you was an error,—your subscription will expire with No. 26, vol. 5.

"J. G. P. of Va."—We have sent you the Nos. you requested, except Nos. 18 and 39, of vol. 2, which we have not. There is a balance of 75 cents which we will add to your subscription, in the absence of any thing to send you.

A. S. of N. C. T. and B. of N. Y. W. W. of Ct. S. S. R. of Tenn. and J. G. P. of R. I.

—Your specifications have been completed since our last issue, and the papers sent to you for signatures.

R and W. and P. B. of Ct. L. and B. of N. J. R. O. G. of Ct. and I. M. of Pa.—Your papers have been deposited in the Patent Office since last week's issue of the Scientific Amer.

Money received on account of Patent Office business since Sep. 4th—A. S. of N. C. \$50. L. T. of N. Y. \$5. P. B. of Ct. \$20. J. F. of Mass. \$30. J. B. F. of N. Y. \$20. H. A. of Ill. \$30. I. M. of Pa. \$20. L. B. of Ala. \$30. W. S. of N. H. \$25.

Read This.

It is known to most of our subscribers that it has been our usual custom to send with the last number of each volume a prospectus of the forthcoming volume printed on a separate sheet, from the paper and a blank left for filling out with the names of new subscribers.

As the Post office law now prohibits the sending of such circulars we are obliged to refrain from thus accomodating our patrons this year which we very much regret, however we hope and feel confident that our friends will not take less active measures to get up clubs than if a blank was sent for that particular purpose.

Peruse our new prospectus which has been published in each number of the Scientific American for the last three weeks, and if you think the new volume is to be worth its cost (illustrated as it will be with our 500 engravings of new and useful machines,) please make no delay in ordering it yourself and withal, ask a friend or two to join you.

See our terms to clubs and remember you are not only rendering your friends a service by getting them to subscribe but an also contributing to advance the cause of inventors and helping to sustain their rights.

The Scientific American has advocated the interest of inventors and mechanics since published by its present proprietors and it shall continue to do so as long as the publication is sustained.

To one and all we would say subscribe, and to insure your elves the volume complete we would advise you to send in your orders early as the first numbers are many times exhausted before the volume has one quarter expired.

Scientific American for Binding

As this number closes volume 4, we would suggest to those that desire to have these numbers bound to send them to this office and have them executed in our usual manner, for the low price of 75 cents.

You can depend upon having your volumes well bound by sending them to this office as they will be executed to conform in style with hundreds that we have bound for ourselves and the trade.

The Benefits of lilustrating inventions.

According to our Patent Laws, no old machine that may have been used abroad, it not used here, and not described in some printed work, would interfere with a patent in this country. All the machines which we illustrate, if not described, as patented, or about to be patented, are made common property,their parts are free to be used by any person. Many of our subscribers receive valuable hints in this way. We have published a history of the rotary engine in this volume, illustrated with 67 good engravings. We have no doubt but these engravings will be the neans of saving much to inventors, it lets them know what has been done before, and makes them acquainted with those things that would prevent them from securing a patent.

We like to throw as much light abroad as possible. Many ingenious men spend both time and money to perfect machinery (to them unknown) which have been tried and laid aside. We will honestly endeavor to be a beacon light to guide the ingenious man into the right haven, by pointing out the rocks and shoals that surround him.

Subscribers Attend.

Remember—That this number of the Scientific American closes volume 4.

Remember—That our terms for this paper are low and payable in advance in all cases.

Remember—That the Scientific American is the leading mechanical paper in this country.

Remember—That this publication is considered a standard work and that thousands of volumes are bound every year, many of which are placed in public libraries.

Remember—That volume 5 commences next week, and that it is to be printed on new type, to be embellished with a beautiful border and that the work shall exceed in interest all past volumes.

Remember—That we have a friendly confidence that all our subscribers whose term expires with this number, will re-subscribe and, withal, send along at least one more name each besides their own.

Remember—That every person who subscribes gets full value for his money, and we publish many receipts worth ten times the amount to every body.

The inducements to subscribe for volume 5, are of no ordinary character, and no man can lay out wo dollars to better advantage, and that will return as good interest; as investing the same in a years' subscription.

In our next volume there will be more illustrations of machines and machinery, of every description, than can be found in any book that is five times the price of a year's subscription.

ZZCEL

Accountant's assistant, 260
Acoustic telegraphs, 149
Aerial locomotion, 226
Agricultural improvements, 37
Agricultural experiments, 37
Agricultural experiments, 37
Agricultural experiments, 37
Agricultural experiments, 38
Agricultural experiments, 37
Agricultural experiments, 37
Agricultural experiments, 37
Air locomotion, compressed, 82
Air navigater, 4
Alarm, instantaneous 100
Alcohol, freezing, 238
Alumina, 27
Animal ext, 72
Animal heat, 71, 331
Animal heat, 171, 331
Arthacite coal, and locomotive englues, 285
Antimony, 27
Archimedes, 174, 182, 190
Arkwright, Richard, 326
Arsenic, 114, 152, 160
Artic Expedition, The 25
Artificial lowers, 76
Artificial slate, 26
Artificial legs of Indian rubber, 80
Artificial slate, 26
Artists, 107
Art, respect for 67
Art, decorative 408
Asbestos, 360
Atmospheric churn, 20
Atmospheric churn, 20
Atmospheric churn, 20
Atmospheric churn, 20
Atmosphere, height of the 67
Atmosphere, height of the 67
Atmosphere, pressure of the 334
Attraction, 98
Augur, Ash's engraving, 217
Axles, 380
Axles for turning curves, two engravings, 157

Bacon, 284
Bacon, Francis 222, 230
Baking invention, 228
Balance pump, Dodge's, eng. 12
Bald heads, cure of 412
Ball Axle, 82, 116
Ball axle. Chinnock's two engravings, 148
Ballooning, 37, 237
Balloons, 157, 189, 205
Balleton, RR. 297
Baltimore & Harrisburg RR. 57
Baltimore and Obio RR. 33: 185
Band boxes, 268
Banvard's panorama, two engs. 100
Barometer, new 20, 408
Bear's oil superseded 397
Bee hive. Spurgin's, 2 engs. 5
Beets, 146
Bella, casting, 190
Blacking 418
Blanchard's patent, 254, 259, 267, 278
Blid hing es, 72
Blow pipe, engraving, 259
Beats, 51
Boiler explosions, 221
Boiler feeder, 300
Book folding machine, 355

Boring machine, 28
Bosphorus, The 67
Boston, introduction of water
into 50
Read and, improved 88
Brad nwl, double headed and
finishing; 3 engs, 12, 18
Brake, Boynton's, eng. 321
Bras separator, Benton's, two
engravings, 257
Brass castings, 24
Brass cornaments, 211
Brass, to zinc 316
Brass, working in 187
Bread, adulteration of 38
Bread, leavened 216
Bread made from horse chestnuts, 77
Brick, 301
Bricks, ventilating 404
Brick machine, Adam's, eng.
156
Brick machine, Franklin's, eng.
292
Bridge tubular, 116
Bridge tubular, 129
Bridge tubular, 138
Butter, 323
Burning well, 83
Burt milstones, 380
Busts, 132
Button manufactures 388
Butter, 325

Calabar 394
Calculating machine, Haines, two eng. 388
Camera Leucida, eng. 29
Camphor, 243
Camphor, solution 176
Candles, 140
Cannon shot, 116
Capstan and windlass, 2 engs. 177
Capstan and windlass, Andrews, 2 engs. 361
Capital and labor, 37
Car coupling, 186, 284, 372
Carding machine, 324
Carpets, 309
Carriages, hose, eng. 286
Carriages iron 69
Carriage spring, eng. 17
Car springs, Beer's RR. 4 engs. 322
Car wheels, 2 engs. 183
Cars for turning curves, 4 engs.

Carriages, hose, eng. 236
Carriages iron 69
Carriages pring, eng., 17
Car springs, Beer's R.R. 4 er 332
Car wheels, 2 engs. 188
Cars for turning curves, 4 er 76
Carving, Chinese 56
Carving machine, 332
Cast iron houses, 293
Castor oil, 34
Cattle feeder, eng. 372
Cayuga and Susqh. R.R. 273
Cement, fire-proof 163
Chaik, 2
Chaik, 2
Charcoal, 38
Cheese, potatoe, 18

Chemical law. new 8, 16, 24, 32, 40, 43, 56, 64, 72, 80, 88, 96, 104, 112, 120, 128
Cheshire RB, 157
Cheenira 499
Chilolains, 232
Chimney cap, improved 204
Chlorine gas, 342
Chloroform in Surgery 413
Chloroform applied to the skin, 259
Chloreform a substitute for steam, 12
Cholera, 29, 43, 64, 69, 98, 106, 115, 227
Cholera aud the atmosphere 398
Cholera liquid, 11
Cholera protector, 2 engs. 132
Chuck, improved taper 20
Chuck, Martin & Parry's, eng. 204
Churn, Irving's, eng. 156
Cinnabar, mines of 62
Cincin. and St. Louis RR. 209, 225
Clock, astronomical 101, 141
Clock, electro magnetic 347
Cloth and wool drier, 2 engs. 73
Clover, extract of 258
Coal, 28
Coal Trade, Pa. 393
Coast survey 101, 105, 158
Cobalt, 357
Cochesion, 270
Cohesion, 270
Cohesion, 270
Cohesion, attraction of 32

Clock, electro magnetic 347
Cloth and wool drier, 2 engs. 73
Clover, extract of 258
Coal, 28
Coal, 28
Coal, 28
Coal Trade, Pa. 393
Coast survey 101, 105, 158
Cobalt, 357
Cochineal, 142, 198, 405
Cocculus Indicus 171
Coffee, disinfecting property of 88
Coffee, Liberia 37
Cohesion, 270
Cohesion, 270
Cohesion, attraction of, 32
Coke 50, 196
Coke vs. diamond 12
Collars and hoops, joining 252
Colors: 128, 136
Columbus and Xenia R. R. 161
Combustion, 134
Combustion, 10comotive, 140
Comp ass, the, eng. 291
Compensation box, 252
Contraction, 371
Cooking stoves, 34
Copper as a poison, 176
Copper and zinc ores, 172
Copper, tinning 136
Copper, to ascertain the weight of 24
Coppers as a disinfectant, 2
Cordage, kyanized 52, 356
Cork 253
Corn sheller 2 eng. 89
Cotton gin 206
Cotton gin 206
Cotton gin 188
Cotton gin improvements, 2 eng.

Crank, 307
Crape shawls, 61
Cream, 75
Cream, crock, 40
Criving marshine, ong. 748
Crucibles, 216
Cublodion, 251
Currents, 134
Currents of the Gates of Hercules 418
Curve, R. R. eng., 360
Cylinders, life boat, 284

Dead Sea expedition, 3
Deafness, 76
Deathn of painful, 19
Delineator, 2 engs., 140
Dental chair, 2 engs., 140
Dental chair, 2 engs., 137
Diamond, oxidation of the, 59
Diseases, Contagious 394
Disinfecting fluid, 72
Ditching machine, 4
Diving bell, 1
Diving bell, Worster's, 3 engs, 313
Dog power 34
Dogr springs 42

Dog power 34
Dogr springs 42
Dragons blood 62
Drawings, chalk and crayon, 288
Dredging steamboat 188
Drill. hand, eng., 348
Drilling machine, 2 engs., 161
1 ropsy 104
Dry Dock, Ballance 412
Dumping car, eng., 220
D yentery 24

Ear hquakes 18
Easet Tenn. and Ga. R. R. 89
Eggts, preserving 48
Electric light 67, 92, 108, 133, 236
Electric telegraph, evg., 35, 43, 51, 59, 75, 83, 91
Electrical light, Paine's 101, 117
Electrical current 396
Electricity as known among the ancients 390
Electricity, animal 228, 320
Electricity, source of 307

ancients 390
Electricity, animal 228, 320
Electricity, source of 307
Electricity, speed of 275
Electro magnetic clock 324
Electro magnetic engine 180, 244
Electro magnetism 197, 198
Embroidery 371, 382
Emery 67
Endless chain pump 98
Engines, high and low pressure 4 engs. 261, 277
Engine brake 244

Cotton gin improvements, 2 eng.
404
Cotton manufactures in R. I. 410
Cotton machinery 348
Cotton picker 172
Cotton press 340
Coupling joint, 260
Courtesy, Dr. Chalmers on 410
Crane, 68
Cotton press 340
Courtesy, Dr. Chalmers on 410
Crane, 68
Engine, horizontal, eng. 54
Engine, hori

Ether, administering 84
Eye, the 374
Eye, light of the human 158
Explosions, lacomotive 294

Factories, lighting of 78
Fan and Fly wheel 380
Faucett, imp, water 60
Faucett, molasses 180
Faucett, Gee's 2 engs. 92
Faucet, Steblins', eng. 220
Feed apparatus 355
Felloe machine 132, 284
Felloe machine, Adams & Moore's, 2 engs. 169
Fence for the prairies 88
Field Irrigator 244
Filter, portable, Eng. 412
Filtering 341
Fire annihilator 236
Fire arms, 2 engs. 108, 115, 372
Fire cements 40
Fire engines 212
Fire escapes, 52, 236
Fire lock 52
Fire proof paint, Blake's 413
Fire. silver 392
Fishes 11
Flannel 33
Flax cultivation 349
Flooring composition 56
Flowers in winter 49
Flour cleaner 364
Fluorine 192
Flying machines 109, 132
Fly wheel, the 243
Fog bell 293
Food made of Indian meal 389
Force pumps and fire engines, 2 engs. 225
Foreig Corresp. 10, 30
Forge and bellows, portable 34
Fosil footprints 30
Fountain marking brush 76
Fountain pen 292
Franklin Institute, circular of the 387
Friction brake, eng. 268
Fruit, preserving 3
Furnaces 366

Friction brake, eng. 268
Fruit, preserving 3
Furnaces 366
Furnace bars 244

Ga. R. R. 1
Galena & Chicago R. R., 329
Galileo 198, 206, 214
Galvanic Sheeting 32
Gas apparatus 34
Gas and steam engines 149
Gas consumers, hints to 10
Gas illumination 206
Gas light monitor 132
Gas meter 43
Gate, vertical 404
Gems, artificial 384
Genius 67
Geology 139
Germantown R. R. 249
Gilding, dry 200
Gild silk or ivory by hydrogen
gas, to 54
Gilass, manuf. of, 8 engs. 328,
336, 344, 352, 357, 368

Glass moulding 76
Glass, sensitive 338
Glass, sensitive 338
Glass, silvering 356
Gloves, to clean 280
Glue 16
Glue, liquid 360
Gold leaf and gold wire 168
Gold mine machinery 20
Gold pens 34
Gold washer, Danforth's eng. 233
Gold washer, Danforth's eng. 185
Gold washer, Glenn's, eng. 185
Gold washer, Singer's, eng. 164
Golden yellow 72
Governor, Bakers, 3 engs. 340
Grain separator, Sanders, eng. 324
Grain separator and thresher, cng. 276
Grape vines 38
Grass, curious 400
Grass cutting machine 2 engs. 289
Gravitation, attraction of 32
Grease, axle 396
Grist mill, metallic, 3 engs. 49
Grinding mill, eng. 201
Grooving machine 172
Grummet, metallic 60
Guage, Lyman's, eng. 308
Guage, cock, steam 90
Guage cock, 7 yler's eng. 148
Gunnery 130
Gunpowder and Greek fire 27
Gunpowder experiments 402
Gunshot wounds 28
Gun stock machine 91
Gutta percha 149
Gypsum mounds 27
Gymnastic Balloonist 410

Hail. formation of 35
Hammer, steam 60
Harlem R. R. 209
Harness, Vogel and Thomas
5 engs. 45
Harness machine 34
Harness machine 34
Harness machine 34
Harness machine 38
Harrisburg and Lancaster R. R. 25
Hartford and Bristol R. R. 241
Hay and straw cutter, Tupper's
412
Heading machine 2 engs. 353
Heat and electric light 211
Heat and electric light by friction 190
Hemp 140, 311, 406
Hoisting apparatus 292
Honey bee, the 219
Honor to whom honor is due
45, 53
Horizons, drawing false 131
Horn pressing machine, eng. 17
Horse power 28, 138, 4121
Horse power, Berthof's, eng.
212
Hot blast for furnaces 181
Hudson river R. k. 17, 57, 97,
201, 297, 385
Husk beds 66

Hydraulic engine 266 Hydraulic press, Bramab's 20 Hydraulic regulator, Pitcher's 2 engs. 369 2 engs. 369
Hydraulator, the 2 engs. 60
Hydraulator, Vedders' eng. 105
Hydro carbon gas, White's, 285
Hydro cyanic acid 240, 248
Hydro electric light, Paine's 347
Hydrogen gas 200, 267, 384, 392
Hydrophobia 2, 42, 238

Ice 50, 112 Ice cream freezer, 2 engs. 252 Ice cream machine 52 Improvements, opposition to 5 Incrustations 316 Ind. R. R.'s 337 India and the Co India rubber 67
India rubber cloth 180
Indianapolis R. R. 153
Indigo 107
Industrial Heroes 387 Inks of different colors 3, 224
Ink out of linen, to take 74
Insects, 142 Inventors 181 Iodine 192 Iron 109 Iron ore 28 Iron, annealing wrought 148
Iron hridge 118 Iron hridge 118
Iron enamelling 156
Iron galvanized 392
Iron, malleable 332
Iron, manuf. of 60, 236
Iron moulding 17 engs. 384, 392
400, 408
Iron, soldering 142
Iron blooming machinese 2 Iron blooming machinery, 3 eng. 393
Iron hridge 404 Iron hridge 404
Iron storehouses 402
Iron, steel, and sheet iron, to
weld 16
Irregular forms, turning 30, 38, 228 Isinglass 21

Jaw temples, 3 engs. 292 Jewellery 376 Joint, universal, 2 eng., 401 Joint, Hooks, eng. 265 Jointing machine 244, 324

Ivory 35 Ivory, flexible 412

Key, ingenious 260
Keyed violin 4
Kilns, steam and charcoal 90
Knife, bread, eng. 316
Knitting looms 396

Labor, dignity of 53
Lackering, art of 64
Lacquer, gold reed and palebrass 3 6
Ladder 6brass 3 6
Ladder, fire, 2 congs. 316
Land and water 337
Languages and learning, 409
Lantern, mining 201
Lard 66
Lard lamps 58
Lasts 122
Latch and locks, Morris, eng, 100. 100~ Lathes, 26
Lathes, double gearing, 4 engs.

Lathes for turning axles, slide 2 engs. 122
Lend 184, 192
Lend, sulphate of 136, 388
Lead pipe 6, 39, 84
Lead pipe machines 84
Lead, reduction of sulphate of 388
Lead to associate the sulphate of 388 Lead, to ascertain the weight of Leather, ornamental 200
Leech, artificial 310
Leech, artificial 310
Leeches bite, how to make 40
Leeches bite, how to make 40
Levelling 59
Leverrier's planet 34
Life preservers 34
Life preserving mattrass, 2 eng: 234
Lifting and force pump 4
Light, velocity of 147
Light, velocity of 147
Lightning conductors 307, 333, 349, 362, 373
Lightning protector 260
Light, emanation of 408
Limes 317

Lime 317
Lime, chloride of 354
Lime in building 302
Linen, receipts for cleansing
240. Liqu da, gravity of 339 Literature in China 86 Lithographic press, eng. 329 Lithographic stone, American Lithographs on linen, to paste 240 Lock and key 92 Lock, Colton's, 5 en s. 36 Lock jaw 114 Locomotive, imp. 36 Locomotive boiler for anthracite Locomotive speed, 41, 66
Locomotives for common roads

412 Loom 303,356 Loom, carret 132 Loom picker 292 Loom, Steurnes', 3 engs. 377 Longitude the 389 Longitude the 389
Lubricating oil 58
Lucifer matches 208
Lumber wagons 196
Luce 162

Machine labor 102 Machinery, 139
Machinery, power of, 2 engs. 116
Mad River R. R. 346
Madder, cultivation of 403
Magnesse 98
Magnesia 8
Magnetic attraction 120
Magnetic clocks 178
Magnetism 298
Mahogany, artificial 48
Mahogany, stain 275
Manufactures 157
Manufactures, value of, 29
Marhle, Arkansas 412
Marine glue 248
Mass. R. R. 33
McAdamized road in Egypt 411 Machinery 139 Mass. R. R. 33
McAdamized road in Egypt 411
Neat chopper eng. 97
Meat cutting apparatus, Perry's 2 eng., 385
Meat cutting apparatus 2 engs.
385
Mechanic arts 29, 99
Mechanical Follows 397

385
Mechanic arts 29, 99
Mechanical Fallacies 397
Mercury 2, 200, 203
Mercury 2, 200, 203
Mercury 2, 200, 203
Mercury 2, 200, 203
Mercury 340
Metalloy 288
Metal for sheathing 316
Metals, assaying 340
Metallic compounds 276
Metallic packing 26
Metals, formation of the precious 395
Meteorites 94, 115
Meteorological knowledge 390
Meteorological statistics 181
Metre, self-registering, Eng. 412
Mezotinto engraving 152
Mich. R. R. 177, 241
Microscopic discoveries 11
Milk, analysis of. 8
Milk, varieties of, 51
Millet 90
Mill stones 28
Mineralology 11, 179, 187, 195, 203, 227, 255, 267, 275, 282, 291
299, 307, 315, 323
Mirage 131
Mirrors of reflecting telescopes, machines for grinding, 3 Engs. 409
Miss. River 19, 27
Mortising machine 348
Mortising machine. Macomber's

Muss. River 19, 27

Mortising machine, Macomber's'
eng. 223, 260

Mosaic art 373

Moss 299

Motion 2 engs. 180, 310 315, 323, 331, 363 Motion and sound 91 Motive power 317 Mounds of Wisconsin 3 Mowing machine eng. 244
Music, power of, 86
Muscular development 412
Mushrooms 398

Nail making 245
Naphtha 258
Naphtha 258
Naptha vs chloroform 404
Nash. R. R. 73, 129
Nautical architecture 70
Nautical telegraph 260
Needles 317 Neptnne, planet 61 New Jersey R R. 409 Nitric acid 360 Nitrogen 368
Nutriment 3
N. Y. and Boston R. R. 33, 121
N. Y. and Eric R. R. 9, 65, 121,
217 N. Y. and New Haven R. R. 57 129, 161, 265

Oaks 99 Oatmeal 13 Observatory, Cinn. 386 Ocean, pressure of the, 269 Ohio and Miss. R. R. 185 Oil for machinery 316 Oil of birch bark 122 Oil of birch bark 122
Oil painting 208
Oil saver eng. 20
Opium, effects of, 371
Opium drunkeness 70
Optical illusions 2
Organ, travelling 244
Oxalic acid 224
Oxidation of iron 320
Oxides of iron &c. 32
Oxides of prevent Oxid zing, to prevent metal from, 56 Oxygen 347 Oxygen in reducing metals 376

Pacific R. R. 113 Paddle wheel 2 engs. 26. 68, 156, 284
Paint 140, 276 Painting, electro 376 Panawa R. R. 153, 337, 369 Paperhangings 365 Paper pulp from straw, manuf. of 142 Patent cases— Blanchard vs. Brown, 77, 133, 258, 301 Child vs. Lenning, 242 Child vs. Wilson, 188 Edger vs. Alger, 277 Foote vs. Silisbee, 253 Goodwin vs. Waring, 242 Many vs. Sizer, 165 Many vs. Sizer, 155
Morse, vs. Bain. 213
Morse vs. O'Reilly, 13, 35, 325
Serril vs. Crawford, 242
Simpson vs. Lieper, 85
Tatham vs. Lowber, 293
Wilson vs. C, and A. R. R. 101
Paper, writing 344
Paper, bank 196

Paraffine 248 Paraffine 248
Patent laws 14, 22, 30, 38, 133
Patent office Reeport 157
Patent rights 125
Paving, street 389
Pegging boots 84
Peat bogs 396
Pen halders 44
Pen telegraph 124
Penn. R. R. 25
Percussion caps 212
Percussion guns, priming for 16 Percussion guns, priming for 16 Perkins, Jacob 405 Perpetual motion 4, 109, 316 Perpetual motion 4, 109, 316
Perpetual motion machine, magnetic 412
Peruvian bark 78
Phila. R. R. 233, 297
Photographometer, the 219
Physiology 139
Piano 20
Piano attachment 28
Pianoforte types 43

Piano attachment 28
Pianoforte tuners 43
Pianoforte tuners 43
Picket machine eng. 37
Pigments 332
Pill machine 34
Pimples on the face 290
Pine free insect 290
Plague in the West, cold 414
Planing machine 34, 43, 54, 62, 70, 73, 204, 380, 406
Planing machine, Barnum's, eng. 137
Planing machine, Daniel's, 2 engs. 52
Planing machine, Law's 4 engs. 281 281
Planing machine, Ware's, 2
engs. 241
Planing machine, Woodworth's,
94, 101, 102
Plaster of Paris 411

Plaster casts, metallization of 171
Platina metal 222
Plating by heat I48
Plough 92 Plough 92
Plough, rotary mould board 52
Poets and inventors 109
Poison, apparatus for extracting
eng. 321
Poison, Indian arrow 83
Poison, Indian arrow 83

Poisons and antidotes 386
Poison, precaution against 413
Poisonous metals 144 Postage, cheap 413
Potass, salts of 330
Pot and pearlash 406
Potash of commerce 408
Potatoes, machine for washing Pounding machine 340

Pounding machine 340
Premiums awarded at the fair 50, 58, 66, 74, 82
Pressure 112
Pride 6
Printing improvement 212
Printing machine 2 engs. 73
Printing presses 68
Prize essay 200, 204, 272
Progress and the press 5
Propeller 132
Propeller, new 2 engs. 9, 188
Propeller, Patch's, eng. 33
Propeller, Patch's, eng. 33
Propelling steamboats, novel mode of 12
Protracting table eng. 337
Providence R. R. 345
Prassic Acid 385
Pulque of Mexico, the 33
Pump, Bennett's, 45, 53

Pump, Bennett's. 45, 53 Pump, Kase's, 275 Pumpkin's, Le Sten, 40 Punctualtty 411

Quadrature of the circle 26 Quartz, artificial 388 Quince marmalade 2

R Railway collisions, to prevent Railway collisions, to prevent 68
Railway station index, Ely's, 4 engs. 1, 4
Raspberry 99
Rats. to kill 96
Rattrap 2 engs. 84
Reading R. R. 209
Reaper 364
Reaping machines 108
Reciprocating Paddles 196
Red River R. R. 89
Refining gold and silver 200
Refrigerators 60
Regulator 188
Regulator, Allen's, eng. 364
Regulating motion 4
Remmington bridge 77
Rhinoceros, African 67 Rhinoceros, African 67 Road scraper 103 Roch and Lockport R. R. 89, 273 Rock drilling machine 100 Rock, singular 91 Rochester and Syracuse R. 409 R∘pe 1

Rope, cotton 348
Rope making machine, Clum's
2 engs, 193
Rol'er gins 92
Roller box 196
R ses, oil of 339
**Return engine history of the *Rotary engine, history of the *Rotary engine, mistor, 67 engs.

67 engs.

[Will be found on the lagt page of each paper from page 32 to page 320 inclusive.]

R. R. accidents 9, 33

R. R. hrake 92, 244

R. R. brake, Burling's, eng. 252

R. R. Cars, improvement in 47 60 R. R. iron, straightening 20 R. R. springs, india rubber 84 R. R. switches 36, 124

Rudder, Gallup's, 2 Engs. \$80

Rudders 364

Sail cloth, cotton 20
Salt water and fresh 2
Saltpetre explode, will 74
Sanding machine 380
Sar. and Whitehall R. R. 257
Sash lock, Arnold's, eng. 260 Saturn's ring 2 Saws 26, 116

Saws 26, 116
Saws, sharpening and setting 396
Saw filing machine 2 engs. 228
Sawing irregular shapes 13
Sawing machine eng. 172
Scagliola 26
Science, investigation of 6
Science, poetry of 262
Science progress of 69
Scientific Association, American 403, 410, 411
Scientific memoranda 62
Screw cutting 63

Scientific themoranda 02
Screw cutting 63
Screw wrench and hammer 220
S. C. R. R. 73
Scurvey, starch a cure for 6
Scythe manufactory 91
Sea water, saltness of 88
Sea weed for manure 52
Screents bite of 56 Serpents, bite of 56
Sewing machine 268
Sewing machine, American 3
engs. 145
Sewing machine, French 2 engs.
153

Sheathing, yellow metal for 72 Sheet lead 68 Shingle machine eng. 117, 380
Ship huilding, impmt. in eng. 132

132
Ship building and navigation 414
Ships light 76
Sight, restoration of 232
Silex 330 Silex 330
Silk 242
Silk, culture of 77
Silk, to clean 280
Silk worm 99
Skate 132
Skates, horse 172
Sleigh, improved 2 engs. 45
Sleep 21
Smithson in st. 114
Snodgrass 358

Smithson in st. 114
Snodgrass 358
Soap 284, 372
Soap stone 349
Sofa bedstead 164
Sofa table 164
Solar system 310, 318
Soldering iron or steal 332
Solid forms, changes in 72
Sound, measuring distance by 24 24

24
Sounding apparatus eng. 381
Sower and planter 220
Spheres 116
Spherical mill, North's 34
Spike machine 348
Spike puller eng. 108
Spiedles 2 engs. 180

Spindles 2 engs. 180 Spindles, of grist mil stones 284 Spinner, Dodge's 396 Spinning machine 204 Spinning wheels 84 Splitting paper 164
Stave dresser and jointer saws
93

Staves, planing rived 36 Steam boiler explosions 45, 246 250, 258, 277 Steam boiler feeder, Bartle's, 2 engs. 305

engs. 305
Steam hoiler incrustations 11,
19, 46
Steam carriages 2 engs. 25
Steam, expansion of eng. 187,
195
Steam, expansihility of 245
Steam engine indicators 2 engs.
280
Steam engine, impmts, in the
212, 220
Steam engine, return incline for

Steam engine, rotary motion for mills eng. 265
Steam engines, new system of

76
Steam navigation 2I, 141
Steam navigation, history of 334, 342, 350, 358, 366
Steam pump, Fulton's, 26
Steam regulator 268
Steam boilers, iron and copper 397

397
Steam expansively, using 410
Steel. adirondac cast 341
Steel, chemical character of 53
267
St eel yard, Jacobi's, eng. 217
Steering apparatus 52, 340
Steering apparatus, Andrew's, eng. 356
St. Lawrence and Atlantic R. R. 169

St one cutting machine 2 engs Stone, new process to color 23 Storms 139 tove, portable air heating 236

Stove, portable air nearing 200 Stove pipe, machine for making tumbler, 3 engs. 401 Straw bleaching 46 Straw cutters 4 Engs, 300 Straw cutters, Hovey's, 3 engs. 236 Str w 301 Strength, best form for 13 Striking bells 196 Strychina 144

Strychina 144
Stump machine 2 engs, 244
Stumps, to remove 212
Sturgeon and isinglass 21
Sugar, potatoe 309
Sulphuric acid 202 Sumach, tanners 42
Sugar planting 93
Sugar, beet root 388
Sugar Honey 396
Surgical apparatus 308 Surgery, case of 394 Suspension bridge 10

witch, R. R. 308 witch, Hick's, R. R. 2 engs. 196 witch stand, Woodward's eng. 124 Syracuse and Oswego R. R. 41

Tail block 180
Tan bark, spent 43
Tanbotype 260
Tea plant 366
Tea in the U.S., culture of 21
Telegraph, the 9, 14. 29, 34 60
236, 298, 361
Telegraph, Bain's, 101, 123
Telegraph, Bain's and House's, 257
Telegraph, Bakewell's 363

Telegraph, Bain's and House's, 257
Telegraph, Bakewell's 363
Telegraph controversy, the 83
Teeth, decayed 404
Telegraphic accuracy, 386
Terrestrial magnetism 400
Telegraph, electro chemicaleng. 364
Telegraph, improv'nt in the deflective 60
Telegraphic system, the 29
Telescope, water 296
Telescope specula 92
Tempering edge tools 306
Ten hour system 302
Tenn and Va. R. R. 273
Telonkonponon, the 90
Theodolite and circumferenter 251 251

Thermometer and gravitating clock 36 clock 36
Tides 32
Tidel currents 11
Tilting wagon 236
Tinning 269
Tinsmiths' wiring machine, 2

engs. 396
Tobacco cutting machine eng.

65
Tongueing and grooving machine 260 292
Tooth extractor 2 engs. 197
Toothache, remedy for 18, 32
Toprographer 196
Tortoise shell 27
Transit of Mercury and Venus

408
Tripoli for polishing 82
Truck, impd. curved spring eng.
60
Truck for narrow curves eng. 97

Truck for narrow curves eng Truss hridge 188 Tube telegraph 164 Tubes, steel 324 Turbine wheel 100 Turbine wheel governor 164 Turpentine, oil of 354 Turn tables 44 Turnip meal 2
Tuyere for forges 244
Type, copper 372
Type machine, copper 340
Type machine, copper 340

Umbrellas, alapaca 84 Utica R. K. 369

Vapor bath 184 Vapor bath 184
Vapor engine 140
Varnishes 104, 299
Valve, Winne's, eng. 268
Vegetarian society 122
Velocity, shipa 292
Ventillation 2 Engs., 286
Vision, physiology of 371
Vision, theory of 6
Vt. central R. R. 1

Wagon hox 76
Wagon wheel 308
Walking beam engme eng. 65
Wall of china 70 Wall of china 70
Washing machine 34, 124
Washing, new mode of 252
Water gate for canal lock 268
Water, to preserve 396
Water guage, Faber's 386
Water in steam boilers, temper-Water, nature of 339
Water, power of 35
Waterproof, to make linen &c.
376

376
Water wheel 4,26,108,284,292
330,355
Water wheel, archimedian 173
Water wheel, Conant's, 2 engs.
297
Water wheel, screw 252

Water wheel, screw 252
Water spout 414
Waves, cause of 6
Weavers beddles 5 engs. 41, 44
Western R. R. 225
Wheat, composition of 370
Wheat, new kind of 85
Wheat, sick 418
Wheat, poison of rusted 414
Wheeling bridge case 414
Wheel pump 44
Wheel, R. R. car 124
Whistle, alarm 388
Whistle for sea, alarm 388
Whistle for sea, alarm 388
Whistlesses 34
Windmills 108 Windmills 108

Window blind morticing 2 engs, 209 Window curtains 76 Window shades 2 Engs. 300 Window latch, Badger's, eng.

No. 396
Wines, old 386
Wire and hamp rop 28.74
Wire fence 3, 316, 364
Wire Machine, Eng. 164
Woods, dyeing 352
Woodworth's Patent 86
Wool spinning 108,300

Wool carding machine, 3 Engs. Wool testing machine, 3 Engs. 345
Wool testing machine, 172
Worcester Mechanics Fair, 413
Worcester R R. 65, 353
Wrench, Merick's, Eng. 348 Wrench and screw driver combined. Eng. 100
Wrought iron, improvement in 12
Wrought and cast iron, to unite 380

Yea and Nay machine 164

Zinc 8 Zinc pails 288
Zinc mines, N. J. 402
Zoophyte 89

POETRY.

Acorns, the crop of 73
Alone 33
American editor I61
April shower 289
Acrostic 297
Aristocrats, the true 233
Autumn 41

Blacksmith's night 273 Brighter days 65 Button, to 289

Church yard stile, the 409 Consolation for the lonely 129

Dirge at Sea, 409 Dying, the 161

Factory girl 361
Falth's guiding star 105
Farmer's daughter 217
Farmer's Hymn 401 Fatherless, the 129 Fisherman, the 137

Genius 73 Genius, lights of 25
Gentle words 265
Girl of the blue eye 25
Go ask my mother 273
Good deed 369 Good in the world 201 Greenwood 385

Hope 113

I will arise and go to my father

Judge gently 393

Lahor 81 Lanor 81
Last leaf 20
Life clock 249
Lightning 97
Lines 41 Love 193 Love of flowers 377

Martyrs of Freedom 898 Martyrs of Freedom 838
Mary 329
Mary's white rose 311
Memory 311
Memory, pictures of 57
Might inakes right 49
Mind that inakes the man 369
Moral cosmetics 225
Moral powers 185
Mrs. Brown 353
Mutual assistance 225
New England 17

Oh! be kindly 265 O, the heart is a treasure 57 Old man's reverie 297 Old printer 337

Pestilence, voice of 241 Poor, the 393 Poor man's doings 233 Pride 217 Prophet child 281

Rainbow, the 393 Rest for the weary 49 Royal pedigree 153

Sabbath, the 169
Sabhath stillness 185
Sabbath thoughts 377
Sciences 305
Seamstress, the 169
Ship canal 321
Simple affinity 65
Snow drop, the 9
Song of the dirt 121
Sower, the 113
Star and the child 209
Stand as an anvil 353
Steam, song of 89 Steam , song of Sympathy 17

There's good in the world 33 There's room enough for all 177
Thought and expression 345
Three weeks after marriage 177 Treasure seeker, the 105 True ornament, the 65
Tuhal Cam 257
Turf is Green 361 Two Shadows 385

Waiting and Watching 1
We watched her breathing 311
Widow's charge, the 401
What is life 1 What is woman 41 Willie 193 Wives, advice to 337
World is full of beauty, the 209

Year's farewell, the 121