

Mention this paper.

SOLID EMERY WHEELS.-BY T. D. Paret.-Early forms of emery wheels and their defects. Yulcanite wheels. The tanite wheels. Testing of tan-ite wheels at Stroudsburg. Best working speeds for emery wheels. Bursting of emery wheels. Tests for emery wheels. Comparative merits of American and Knglish emery wheels. With 2 engravings. Contained in SCINNIFIC AMERICAN SUPPLEMENT, No. 538. Fric 10 c nts. To be had at this office and from all newsdealers.



STEAN PUMPS for Hot or Cold, Fresh or tha, Tar; for Cane Juice, Liquors. Syrups, Scum; for Am-monia, Alkalies, Extracts, Acids; for Thick, Vasilie, Vis-cous or Foul Liquids, etc. Vacuum Pumps of the highest efficiency. Filter Press Pumps. Air, Gas and Acid Blowers. Air Compressors. Etc.

BUILT BY GUILD & GARRISON, Brooklyn, N. Y. HOW TO GRAFT.—A VALUABLE PA-

95 MILK ST. BOSTON, MASS.

This Company owns the Letters Patent granted to Alexander Graham Bell, March 7th, 1876, No. 174,465, and January 30th, 1877, No. 186,787.

The transmission of Speech by all known forms of Electric Speaking Telephones infringes the right secured to this Company by the above patents, and renders each individual user of telephones not furnished by it or its licensees responsible for such unlawful use, and all the consequences thereof, and liable to suit therefor.

Water Wheels New and Second Hand Address FLENNIKEN TURBINE CO., Dubuque, Iowa. -тне**-**

Scientific American Building Edition.

THE SCIENTI IC AMERICAN ARCHI-TECTS' AND BUILDERS' EDITION is issued monthly. \$2.50 a year. Single copies, 25 cents. Fortylarge quarto pages, equal to about two hundred ordinary book pages; forming, practically, a large and splendid Magazine of Architecture, richly adorned with elegant plates in colors, and with fine engravings; illustrating the most interesting examples of modern Architectural Construction and allied

A special feature is the presentation in each number of a variety of the latest and best plans for private residences, city and country, including those of very moderate cost as well as the more expensive. Drawings in perspective and in color are given, together with full Plans, Specifications, Costs, Bills of Estimate, and Sheets of Details.

Architects, Builders, and Owners will find this work valuable in furnishing fresh and useful suggestions. All who contemplate building or improving homes or erecting structures of any kind, have before them in this work an almost endless series of the latest and best examples from which to make selections, thus saving time and money.

Many other subjects, including Sewerage, Piping, Lighting, Warming, Ventilating, Decorating, Laying Out of Grounds, etc., are illustrated. An extensive Compendium of Manufacturers' Announcements is also given, in which the most reliable and approved Building Materials, Goods, Machines, Tools, and Appliances are described and illustrated, with addresses of the makers, etc.

The fullness, richness, cheapness, and convenience of this work have won for it the Largest Circulation of any Architectural publication in the world. Sold by all newsdealers.

MUNN & CO., Publishers,

361 Broadway, New York.

Building Plans and Specifications.

In connection with the publication of the BUILDING EDITION of the SCIENTIFIC AMERICAN, Messrs Munn & Co. furnish Plans and Specifications for Buildings of



MESSRS. MUNN & CO., in connection with the publi-cation of the SCIENTIFIC AMERICAN, continue to ex-amine improvement, and to act as So leitors of Patents for Inventors.

for inventors. In this line of business they have had forty one year' experience, and now nave snegrated facilities for the presention of Patent Drawings, Specifications, and the presention of Applications for Patents in the United States, Canada, and Foreign Countries. Messes Munn & Co. also attend to the preparation of Carvists. Copyrights for Books, Labels, Reissues, Assignments, and Reports on Infringements of Patents. All business intrusted to them is donewith special care and promptness, on very resonable terms.

A pamphlet sent free of charge, on application, con-taining full information about Patents and how to pro-cure them; directions concerning Labels, Copyrights, Designs, Patents, Appeals, Rolssues, Infringement, As-struments, Rejected Cases, Hints on the S le of Pa-tents, etc.

We also send, *freeof charge*, a Synopsis of Foreign Pa-tent Jawa, showing the ceat and method of securing patents in all the principal countries of the world.

MUNN & CO., Solicitors of Patents, 361 Broadway, New York.

BRANCH OFFICES.-No. 622 and 624 F Street, Pacific Building, near 7th Street, Washington, D. C.

The value of the SCIENTIFIC AMERICAN RAY Similar journal more than to see his advertises many times greater than that of any similar journal per divide the source of the world. A budgets and the sea of the source of the source

WITHERBY, RUGG & RICHARDSON. Manufacturers of Patent Wood Working Machinery of every descrip-tion. Facil ties unsurpassed. Shop formerly occupied by R. Bail & Co., Worcester, Mass. Send for Catalogue.

To Business Men.

361 Breadway, New York.



every kind, including Public Buildings, Churches, Schools, Stores, Dwellings, Carriage Houses, Barns, etc. In this work they are assisted by able and experienced architects.

Those who contemplate building, or who wish to alter, improve, extend, or add to existing buildings, whether wings, porches, bay windows, or attic rooms, are invited to communicate with the undersigned. Our work extends to all parts of the country. Estimates, plans, and Terms drawings promptly prepared. moderate. Address MUNN & CO..

