Scientific American.



CAPILLARY TUBES, SPONTANEOUS MATTIMANT 1 UDES, SPONTANEOUS Motion in.—A paper by C. Decharme upon the applica-tion of electricity to the study of the spontaneous as-censional motion of liquids in capillary tunes—the question being studied from a dynamic standpoint. With 10 engravings of apparatus and details. Contain-ed b SCHENTIFIC AMERICAN SUPPLEMENT, No. 538. Price 10 cents. To be had at this office and from all newsdealers.

catalogue. PierceWellExcavatorCo, N2w York.



JAPANESE HOUSE BUILDING. – BY Prof. E. S. Morse. An interesting description of the Japanese method of building: the mode of constructing the foundations. of framing the sides, ends and roof, of Pracing the imbers, and of putting on the tiles. With 19 Illustrations. Contained in SCIENTFIG AMERICAN SUPPLEMENT, NO. 543. 'Frice Il cents. To be had at this office and from all newsdealers. The PRICES The BEST STEAM PUMP.



STEA.

HAVE MANY PATENIMPRI

NOT FOUND IN

THAT WILL WELL REPAY AN

INVESTIGATION

BY THOSE WHO DESIRE TO SECURE

THE BEST SAFE

MARVIN SAFE CO.

OTHER MAKES

This effice and from all newsdealers.
And the science of the Scientific American, continue to examine improvements, and to act as Solicitors of Patents of numerican of the scient for numerican of the scient for numerican diverses they have had forty-one years experience, and now have unequaled facilities for the prosecution of Atent Drawings, Specifications, and the prosecution of Atent Drawings, Specifications, and the science of the science

Interchangeable rubber type; 15 styles of type in Eng-lish, also Greek, Italian, Norwegian, Swedish, Danish, French, Spanish, Russian, etc. "The Hall is, in my opinion, equal to any of the writ-ers on the market for speed, while it is simpler than all, and without a rival for distinctness. "Jas. A. Spaulding, M.D., Portland, Me." Send six cents in stamps for 40 page illustrated cata-logue. Hall Type Writer Co., Saleun, Muss.

ARTESIAN WELLS.—BY T. C. CHAM-berlain.—Principle of artesian wells. Essential features. The water-bearlog beds. The confining beds. Inclina-tion of the heds. Advantages of low inclination of the strata. Surface condition of the porous bed. Rain-fail. Irrigation by artesian wells. Escape of water at lower levels than the well. Conditions relating to the well. Height of flow. Detection of flow. Effect of time on flow. Character of the worder. Limits like the the sinking wells. Record of drillings. Areas of faverabel doubt ful. and adverse probabilities. Illustrated with 31 engravings. Contained in Scientrifo Americans To be had at this office and from all newsdealers.



Express Money Order. Money carefully placed inside of envelopes, securely sealed, and correctly addressed, seldom goes astray, but is at the sender's risk. Address all letters and make all orders, drafts, etc., payable to MUNN & CO., 861 Broadway, New York.

THE

Scientific American Supplement.

This is a separate and distinct publication from THE SCIENTIFIC AMERICAN, but is uniform therewith in size, every number containing sixteen large pages. THE SCIENTIFIC AMERICAN SUPPLEMENT is published weekly, and includes a very wide range of contents. It weekly, and includes a very while range of contents. It presents the most recent papers by eminent writers in all the principal departments of Science and the Useful Arts, embracing Biology, Geclogy, Mineralogy, Natural History, Geography, Archeelogy, Astronomy, Chemistry, Electricity, Light, Heat, Mechanical Engineering, Steam and Railway Engineering, Mining, Ship Building, Marine Engineering, Photography, Technology, Manufacturing Industries, Sanitary Engineering, Agriculture, Horticulture, Domestic Econo-my, Biography, Medicine, etc. A vast amount of fresh and valuable information pertaining to these and allied subjects is given, the whole profusely illustrated with engravings.

The most important Engineering Works, Mechanisms and Manufactures at home and abroad are represented

them is done with special care and promptness, on very reasonable terms

A pamphlet sent free of charge, on application, con-taining full information about Fatents and how to pro-cure them: directions concerning Labels, Copyrights, Designs, Patents, Appeals, Roissues, Infringements, As-signments, Rejected Cases, Hints on the Sale of Pa-tents, etc.

We also send, freeof that w, a Synopsis of Foreign Pa-tent Laws, showing the cost 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.

ELECTRICE C.A. SCHIEREN & CO. G. Ferry St., New York; 416 Arcb St. Philadelphia; 85 Federal Street, Boston.

STEEL WIRE OF CARY & MOEN

THE PENBERTHY INJECTOR. A FAIR PROPOSITION.

As every Injector is tested by the manufacturers before it leaves the factory, we know that, if properly connected and instructions are carried out, they cannot fail to work. The manufac ersoffer to pay the expenses of any man to go to their factory, and \$10 per day while there, if the injector does not work, provided it has not been misused. **JENKINS BROS.**

and described in the SUPPLEMENT.

Price for the SUPPLEMENT for the United States and Canada, \$5.00a year, or one copy of the SCIENTIFIC AM-ERICAN and one conv of the SUPPLEMENT both mailed for one year for \$7.00. Address and remit by postal order, express money order, or check.

MUNN & Co., 361 Broadway, N. Y.,

Publishers SCIENTIFIC AMERICAN.

To Foreign Subscribers.—Under the facilities of the Postal Union, the SCIENTIFIC AMERICAN is now sent by post direct from New York, with regularity, to subscribers in Great Britain India, Australia, and all other British colonies; to France, Austria, Belgium, Germany, Russia, and all other European States: Japan, Brazil. Mexico, and all States of Central and South America. Terms, when sent to foreign countries, Canada excepted, \$4, gold, for SCIENTIFIC AMERICAN, one year; \$9. gold for both SCIENTIFIC AMERICAN and SUPPLEMENT for one year. This includes postage, which we pay. Remit by postal or express money order, or draft to order of MUNN & CO., 361 Broadway, New York.

PRINTING INKS. The "Scientific American" is printed with CHAS DENCE, 71 John St., New York. 105 Milk St., Boston. 13 S. Fourth St., Philadelphia. The "Scientific American" is printed with CHAS bard Sts., Phila, and 47 Rose St., pop. Duane St., N.Y.