Scientific American.

Scientific American. ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT NO. 37 PARK ROW, NEW YORK.

TERMS FOR THE SCIENTIFIC AMERICAN. Clubs.—One extra copy of THE SCIENTIFIC AMERICAN will be supplied gratis for every club of five subscribers at \$3.20 each: additional copies at same proportionate rate. Postage prepaid. Remit by postal order. Address

MUNN & CO., 37 Park Row, New York.

A. E. BEACH.

The Scientific American Supplement is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly. Every number contains 16 octavo pages, uniform in size with SCIENTIFIC AMERICAN. Terms of subscription for SUPPLEMENT, \$5.00 a year, postage paid, to subscribers. Single copies, 19 cents. Sold by

all news dealers throughout the country. Combined Rates - The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for one year postage free, on receipt of seven dollars. Both

papers to one address or different addresses as desired. The safest way to remit is by draft postal order, or registered letter.

Address MUNN & CO., 37 Park Row, N. Y

Scientific American Export Edition.

The SCIENTIFIC AMERICAN Export Edition is a large and splendid periodical, issued once a month. Each number contains about one hundred large quarto pages, profusely illustrated, embracing · (1.) Most of the plates and pages of the four preceding weekly issues of the SC(KNTIFIC AMKRICAN, with its splendid engravings and valuable information: (2.) Commercial, trade, and manufacturing announcements of leading houses Terms for Export Edition, \$5.00 a year, sent prepaid to any part of the world. Single copies 50 cents. IF Manufacturers and others who desire to secure foreign trade may have large, and handsomely displayed announcements published in this edition at a very moderate cost.

The SCIENTIFIC AMERICAN Export Edition has a large guaranteed circulation in all commercial places throughout the world. Address MUNN & CO. 37 Park Row, New York.

NEW YORK, SATURDAY, JANUARY 28, 1882. Contents.

(Illustrated articles are marked with an asterisk.)

Inventions, agricultural. Inventions, engineering. Inventions, mechanical. Inventions, mechanical. Inventions, mechanical. Inventions, mechanical. Inventions, mechanical. Inventions, methods Inventions, recent. Inventions, attention. Inventions, attention. Inventions, attention. Inventions, attention. Inventions, attention. Inventions, attention. Inventions, methods Inventions, attention. Inventions, attention. Inventions, attention. Inventions, attention. Invention in the set of t Fireproof paper and ick Gas figures, photography of, Gas. to nipe 250 miles

TABLE OF CONTENTS OF

THE SCIENTIFIC AMERICAN SUPPLEMENT,

No. 817,

For the Week ending January 28, 1882.

Price 10 cents. For sale by all newsdealers,

I. ENGINEERING AND MECHANICS .- Compound Air Locomotive. The Beaumont Improved Compressed Air Locomotives for Street Railways. 9 figures.... Compressed Air Locomotive Engines..... 5047

5048 The Forth Bridge. 10 figures and full page illustration of the continuous steel girder bridge to cross the Firth of Forth....... 5048 Comparative Diagrams of Large Span Railway Bridges. 13 fig-res. New Continuous Girder Bridge for Firth of Forth.—Old Bridge over the Forth.-Poughkeepsie Bridge.-St. Louis Bridge.-Kuilenburg Bridge.-Bridge over the Vaal, near Nijmegen.-Bommel Bridge.-Britannia Bridge.-Douro Bridge.-Niagara Suspension Bridge.-Saltash Bridge .. 5051 ridge Easily made slide rest ; 3 figures.—Bor ng Amateur Mechanics. Easily made slide rest; 3 figures.—Bor ng attachment; 1 figure.—Gear cutting and apparatus.—Index plates for gear cutting; 1 figure.-Method of graduating index plates; 1 figure.-Apparatus for gear cutting; 4 figures.-Transmitting and

FRAUDULENT CLAIMS IN REISSUED PATENTS.

There are hopeful indications that a final stop may be put to the fraudulent acquisition of patent rights by means of reissues, the most fruitful source of complaint against the working of the Patent Office.

A characteristic illustration of this sort of proceeding was brought out in a case lately decided in the United States Supreme Court. A patent was taken out in 1860 for an alleged improvement in lamps. The patent described a combination of devices, including two domes, one over the other, elevated above a perforated cap through which a wick tube and a vapor tube ascended. It was claimed that this combination of devices, especially including the two domes (which admitted the external air between them for producing a more perfect combustion), would allow a chimney to be dispensed with. The invention was a failure, but the inventor and others found that a single dome, used with a chimney, would be a real improvement: and for fifteen years such lamps, as undisputed common property, were manufactured in large numbers for burning kerosene.

Notwithstanding its intervent worthlessness, a reissue of the patent was ask find obtained in 1873, extending the time, but, as would appear, without any material change in the claims. Meantime, the holder of the patent (not the original patentee) had discovered that, had it covered only a single dome to be used with a chimney, the patent would have been valuable, whereupon another reissue was sought and obtained in 1876, the amended claims being made to cover the very thing the original patentee professed to avoid and dispense with. The object, of course, was to make all manufacturers of kerosene lamps tributary to the assignee of the extended patent.

Suit was brought in the Circuit Court of the United States for the District of Connecticut by the holder of the extended patent, Edward Miller & Company, against the Bridgeport Brass Company, to restrain the infringement of the patent and for an account of profits, etc. The court dismissed the bill on the ground that the second reissue was not for the invention claimed in the original patent. The case was appealed to the Supreme Court of the United States, and the decision of the Circuit was sustained.

In his decision Mr. Justice Bradley comments upon the case and upon the matter of reissued patents in a manner which indicates a clear determination on the part of the Court to discourage, so far as possible, further proceedings of this nature.

After pointing out the effrontery of claiming in the reissue a combination involving the specific device which it was the avowed purpose of the inventor to dispense with, the court points out another grave objection to the validity of the reissued patent, namely, that the suggestion of inadvertence and mistake in the original specification was a mere pretence, "too bald for human credence," or if not, the mistake was so obvious as to be instantly discernible, and the right to have it corrected was abandoned by unreasonable delay. "If two years' public enjoyment of an invention, with the consent and allowance of the inventor, is evidence of abandonment and a bar to an application for a patent, a public disclaimer in the patent itself should be construed equally favorably to the public. Nothing but a clear mistake or inadvertence, and a speedy application for its correction, is admissible when it is sought merely to enlarge a claim."

After tracing the historical development of the abuses which have arisen under the laws granting reissues, the court observes that it is clear that it was not the special purpose of the legislation on this subject to authorize the surrender of patents for the purpose of reissuing them with broader and more comprehensive claims, although under where it clearly appears that an actual mistake has inadvertently been made. But adds the court, by a curious misto for the purpose of enlarging and expanding patent claims.

"Reissues for the enlargement of claims should be the portant particulars. They now announce that should an exception and not the rule. And when, if a claim is too invention or improvement be worthy of a greater reward narrow, that is, if it does not contain all that the patentee is than the sum (\$50) originally fixed, the firm will either entitled to, the defect is apparent on the face of the patent, grant a higher sum, or, should the invention be considered 55 and can be discovered as soon as that document is taken out, worthy of being protected by patent, pay the inventor \$50 of its envelope and opened, there can be no valid excuse for and assist him pecuniarily in disposing of his patent or in delay in asking to have it corrected. Every independent completing it, at the same time reserving to the firm the inventor, every mechanic, every citizen, is affected by such right of using such invention themselves free from the pay-⁵⁵ delay, and by the issue of a new patent with a broader and ment of any royalty for patent rights. These offers still keep well within the bounds of prudence, more comprehensive claim. The granting of a reissue for such a purpose, after an unreasonable delay, is clearly an and indicate a sharp outlook for the main chance. The firm abuse of the power to grant reissues, and may justly be de- enjoy in consequence the pleasure of being generally lauded clared illegal and votd. It will not do for the patentee to for generosity. We shall not be surprised if they discover wait until other inventors have produced new forms of im- in time that it will pay them to still further encourage the provement, and then, with the new light thus acquired, inventive faculty and habit among their workmen, if not by under pretense of inadvertence and mistake, apply for such assisting them to take out patents for their inventions, at 12 an enlargement of his claim as to make it embrace these new least without reserving any right of use without payment of forms. Such a process of expansion carried on indefinitely, royalty. Assistance so rendered might fairly be accredited without regard to lapse of time, would operate most unjustly to generosity; and yet, from a strictly selfish point of view, against the public, and is totally unauthorized by the law. the generosity would pay handsomely, for the habit of In such a case, even he who has rights, and sleeps upon constantly seeking better and more economical methods of | them, justly loses them." working could not fail to make any workman more valua-57 The significance and importance of this decision need ble to his employer, even if it did not lead him to invent

izing claims in reissues has been the source of serious wrong to the public and of hazard to the entire patent system. The Patent Office, as well as honest inventors and the public at large, is interested in having it stopped.

LOSSES BY FIRE IN 1881.

It is estimated that the losses by fire in the year 1881 are considerably in excess of any previous year, and that on account of the competition among fire insurance solicitors and their companies the fire insurance business of the country has, in the aggregate, been a losing business. The fire hazard has been, with many unscrupulous companies, a second. ary consideration, and they have insured anything at more than its value for the sake of the premium, which is practically offering a bonus for incendiarism. Indeed some insur ance men go so far as to say that six-tenths of all the fires that occur are of incendiary origin. Another important cause of destructive fires is faulty buildings, especially in villages and smaller cities, where they are built of wood without the least regard to protection against fire either from without or from within.

The Fireman's Journal publishes a list of 350 large fires that occurred in this country in the eleven months next preceding December, 1881. It foots up nearly \$50,000,000, although it includes only those recorded fires that caused a loss of \$50,000 or more. The average loss by each fire appears to be \$145,000.

There is also a list of 122 fires in December which has such recorded fires as caused a loss of \$10,000 and upward. The aggregate of this list is \$7,500,000, and the average loss caused by each is \$61.500.

Of unrecorded fires and those causing a loss of less than \$10,000, there was probably enough to make the December total as much as \$10,000,000.

At this monthly rate, and making due allowance for the season of the year, it appears that not less than \$100,000,000 worth of property was destroyed by fire in the year 1881 in the United States, the territories, and the provinces.

A notable feature of the list is the very large percentage of the losses set against the various manufacturing industries. If this list was extended so as to include the smaller establishments that have been wholly destroyed, and the less destructive fires in large mills and factories that have occurred during the year, no doubt the proportion would be greatly increased.

As it is, the list for eleven-twelfths of the year does not include losses less than \$50,000. Perhaps three-fourths of the fires in all kinds of factories and workshops caused average losses much less than that amount.

What we can glean from these lists is that there were over sixty woodworking establishments that suffered losses greater than \$50,000, amounting in the aggregate to \$5,750,000.

Establishments that grind or clean grain, causing the diffusion of fine carbonaceous dust in the closed rooms, stand next in number and in aggregate of losses. There were twenty-five of this class, including grist and flouring mills, breweries, distilleries, and elevators, their losses amounting to \$3,000,000. Twenty-five cotton, woolen, and flax mills and cordage works were burned, the loss being \$2,500,000. Of oil works and lard rendering establishments there are in

the lists twenty, whose losses foot up also \$2,500,000.

..... LEFT-HANDED GENEROSITY.

A year or two ago a Scotch firm of shipbuilders established what was widely noticed at the time as a "generous" scheme of, awards to workmen in their employ who should the general terms of the law such a reissue may be made invent or introduce any new machine or hand tool, or improve any existing tool, or make any other change of means or methods calculated to improve or cheapen the work of application of the law it has come to be principally resorted their shipyard. The policy was good, though, if our memory serves, it was characterized by shrewdness rather This is clearly wrong, except where an actual mistake has than generosity, since the granting of the award was condioccurred, not from a mere error of judgment (for that may tioned upon the surrender by the inventor to the company of be rectified by appeal), but a real bona-fide mistake inadver- the right to use the new invention without further charge. tently committed; such, a court of chancery, in cases within The plan seems to have worked well for the company, who its ordinary jurisdiction, would correct. The court adds: | "have been encouraged to amend the scheme" in two im-

Inventions, agricultural.

54 56

50

O. D. MUNN.

converting motion; 7 figures.—Hints on model making	505
II. TECHNOLOGY AND CHEMISTRY.—Firework Formulæ.—Colored lights.—Colored fimes.—Stars.—Rockets, etc. 34 recipes Colored Lights in Parlor Theatricals. Apparatus and formulæ. Popular Science of Colors. By JOHANNES HIRILENGER.—Mix- ing colors.—Brown pigments.—Gray pigments.—Harmony of colors. —Discord of colors.—Phenomena of gradual contrast.—Phenomena	505 505
Of simultaneous contact	
Waterproofing ClothLowery's processPaut's processRei-	
mann's grocessTownsend's processOther processes	605
About Photo-Lithography	505
Mr. Muybridge's Photographs of Animals in Motion	505
The Preservation of Eggs	505 506 506
III. AORICULTURE, ETCTeaIts culture and usesHow to make a good cup of tea	506
ways, etc.	
IV. ARCHITECTURE, ETC.—Suggestions in Architecture.—Houses at Leicester.—Perspective and blans	505
V. HOME DECORATIONPseudo-Ceramics8 figuresHow to make imitation pottery for decorative uses	505