

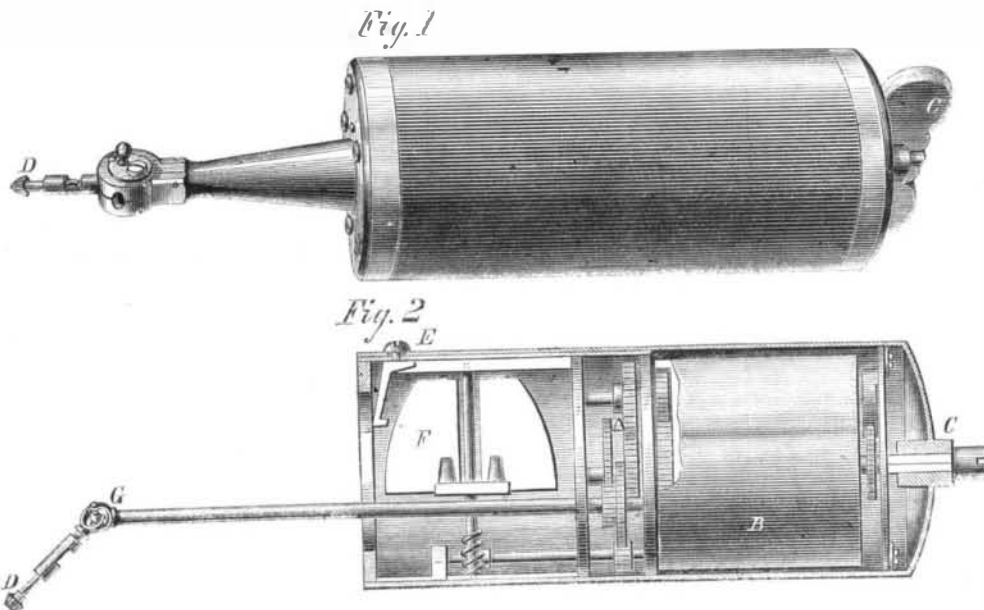
**Improved Grinder and Driller.**

This instrument is intended for dentists' use, and is designed to enlarge cavities and remove the carious portions of the bone with dispatch. From the nature of the mechanism employed to drive the cutting tool, it will be seen that the object is attained.

In the engraving, A represents a train of gearing of the usual kind, driven by a spring in the barrel, B. This spring is wound up by the key, C, at the end (see sections), and will run for a long time; the cutting tool, D, at the end is stopped or started by a spring stop, E, which catches in the vanes of the fly, F. The tool can also be diverted from a straight line and used at an angle of 45 degrees, as shown. A universal joint, G, is provided, so that the rotary action is transmitted without any irregularity.

Externally the instrument is as shown in Fig. 1; this view is very nearly the full size. It can be easily grasped in the hand and directed to any part of the mouth with great facility. There is no prying or pushing in its use, so apt to be the case with the old-fashioned tool, and the patient suffers much less accordingly.

A patent is pending through the Scientific American Patent Agency. For further information address, Philo Soper, inventor, London, C. W.

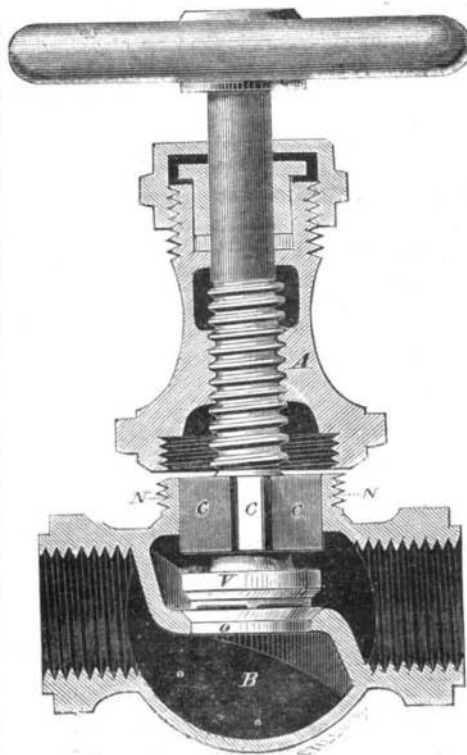


**SOPER'S GRINDER AND DRILLER.**

of Wall street is made by individuals like Mr. Robbins. This supply is increased by these men spending less than their income; it is diminished when they spend more than their income, or when they make loans that are not repaid. It is neither increased nor diminished by the quantity of currency circulating in the community.

**POWELL'S GLOBE VALVE.**

It is well known that globe valves frequently require grinding so as to keep them tight, and prevent leakage through them into the cylinders. Instances



have been known where engines have started from steam creeping through the stop valves and caused great damage.

In this engraving we show a new method of construction whereby the valve may be ground in at any time by merely removing the cap. This method also permits the valve to be constructed much more

cheaply than usual, for a large number of parts may be made up at once and put together irrespective of one being specially adjusted to the other at the time of making.

In the engraving, A represents a screw cap fitting over the shell, B, as usual, at N. The top of the chamber is bored out parallel with the seat so as to receive the wings, C, of the valve, V. These wings, in addition to others at the bottom of the valve, serve as guides to the same, so that as it is drawn up or down by the screw on the stem, it always rises true, furthermore, by simply raising the cap, as shown in the engraving, and rotating the wheel, the valve will bear truly on the seat and be ground in a perfect manner, at the same time the steam passages are unobstructed, and the area of them remains the same.

The invention was patented on May 2, 1865. For further information address the inventor, James Powell, Union Brass and Plating Works, Box 247, Fifth street, Cincinnati, Ohio.

**A NOVEL STORE.**

We have received from Messrs. Kennedy & McCandless, of Oil City, Pa., a photograph which represents an immense barge safely moored at the Phil-

lips Ferry Dock. The trade circular of this enterprising firm, informs us that the barge bears the name of Floating Palace "SCIENTIFIC AMERICAN." The photograph represents the palace as bearing on its side, in bold letters, the title

**SCIENTIFIC AMERICAN,**

to which is added the following miscellaneous list of articles kept on sale in this modern Scientific Palace, viz., cigars and tobacco, pipes, pens, ink, paper, pencils, fish hooks and lines, dominoes, ready-made clothing, boots, shoes, carpet bags, umbrellas brooms, lamps, lanterns, oil and wick thread, needles, pins, brushes, window glass, demijohns, planks, buckets, smoking mixture, clocks, watches.

This firm is bound to succeed.

**Statistics of Manufactures.**

The Secretary of the interior, in response to a resolution of the House, communicates a list of the cities of the United States with the statistics of their manufactures, including those having 10,000 inhabitants and upward. It includes 102 cities, beginning with New York and ending with Newport, Ky. The total capital employed is \$417,129,234; hands employed, males, 410,920; females, 147,000; value of products, \$874,934,827. New York stands first in the list. Capital, \$61,212,757; males employed, 65,483; females, 24,721; value of products, \$159,107,369. Philadelphia employs a capital of \$78,318,885; male operatives, 68,350; females, 30,633; value of products, \$135,979,777. Cincinnati is third in order; products, \$46,000,000; capital, \$17,000,000 in round numbers. Boston; products, \$36,000,000; capital, \$13,000,000. The other principle cities produce as follows:— Brooklyn, \$34,000,000; Newark, \$22,000,000; St. Louis, \$21,000,000; Baltimore, \$21,000,000; San Francisco, \$19,000,000; Lowell, \$18,000,000; Providence \$15,000,000; Louisville, \$12,000,000; Richmond, \$12,000,000; Pittsburgh, \$11,000,000; New Bedford, \$11,000,000; Chicago, \$11,000,000; New Orleans, \$10,000,000; Manchester, \$10,000,000; Troy, \$10,000,000; Rochester, \$10,000,000.

INVENTORS and manufacturers, by reading H. M Crane's advertisement of this date, will learn of something to there advantage.

The average wages of sewing girls in Dublin, Ireland, are 75 cents a week.

THE Scientific American

MUNN & COMPANY, Editors & Proprietors.

PUBLISHED WEEKLY AT

NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

Messrs Sampson Low, Son & Co. Booksellers, 47 Ludgate Hill, London, England, are the Agents to receive European subscriptions for advertisements for the SCIENTIFIC AMERICAN. Orders sent them will be promptly attended to.

"The American News Company," Agents, 121 Nassau street New York.

VOL. XIV., No. 6. [NEW SERIES.] Twenty-first Year.

NEW YORK, SATURDAY, FEBRUARY 3, 1866.

Contents:

(Illustrations are indicated by an asterisk.)

*Merrill's Hoisting Machine.....	79	American Sanitary Museum.....	55
Inspiring of Air.....	79	The Pinch of Unvarnished Walnut.....	85
Photography in Colors.....	79	*Soper's Grinder and Driller.....	83
Araxo's Plan for Proving the True Theory of Light.....	80	The Way the Money Market is Supplied.....	86
Recent American Patents.....	81	*Powell's Globe Valve.....	86
Patent-office Decisions.....	81	A Novel Store.....	86
The Use of Ammonia as a Manure.....	82	Statistics of Manufactures.....	86
Continental Telegraphic Convention.....	82	The Chocera Coming.....	87
*Procurement of Fuel.....	82	Reciprocity with the Canadas.....	87
*The Foot Lath.....	82	Exhibitors at the French Fair.....	87
Casting Car Wheels—Invention Wanted.....	82	Petroleum as Fuel.....	87
Osage and Cholera.....	84	Prosperity and Adversity of Insurance Companies.....	87
Blowing Out Boilers.....	84	Patent Claims.....	88, 89, 90, 91
Saw Cutting.....	84	Notes and Queries.....	91
Mr. Wilkins on Incrustations.....	84	*Pratt's Sulky Plow.....	94
A Portable Engine.....	84	Jelliffe's Hacking Box Holder.....	94
Crosscutting Preserving Timber.....	84	The Lake Tunnel—The Wonderful Artesian Wells of Chicago.....	94
The Way Vermorel's App Made.....	84		
Table for the Teeth of Gears.....	85		

Every man who has money to invest always desires to place it where it will make the best return. This being admitted, we undertake to say that \$3, invested in the SCIENTIFIC AMERICAN, will return three-fold in the amount of valuable information which its columns supply. Mechanics, inventors, manufacturers, farmers—as well as every head of a family—will get, on an average, \$10 worth of information from a year's number of this journal, and yet they can get it for the low sum of \$2 50, in clubs of ten names.

Talk about high prices—here is something cheap enough to stop the mouths of all grumblers. Only think of it—a large volume of 832 pages, full of costly engravings, for \$3, and less to clubs. If any of our readers think we can get rich at such prices, let them try the experiment. Send in your clubs and subscriptions.

THE CHOLERA COMING.

Next summer we are to have the cholera. Its course so far has been just the same as its course in previous visitations, and next summer it will be due in this country. Thousands of the inhabitants of New York will be in the full vigor of health one day, and the next will be hastily borne to their final resting place. A universal panic will seize upon our people; all who can get away will flee from the pestilence; business will be prostrated; and general gloom and stagnation will take the place of our present prosperity.

And yet, all this can be prevented. There is no necessity for the prevalence of the cholera in this city next summer. While the causes of most diseases are hidden from knowledge, the cause of cholera has been positively ascertained. It is filth. The proof of this is conclusive. The progress of the disease in its several epidemics has been carefully watched and faithfully recorded; its history is remarkably full and minute; and, without exception, it has attacked filthy cities only, and it has prevailed only in the filthy portions of the cities which it has attacked.

We have before us a report made to the Citizens' Association of New York, by their Council of Hygiene and Public Health, on the subject of the cholera. This council is composed of the leading physicians of the city—men of the very highest posi-

tion for learning and character—and their report treats the subject with the masterly ability which was to be expected. It traces the progress of the cholera in each of its visitations, and shows that in all places the one cause of its prevalence was want of cleanliness.

The following are a few among the numerous facts cited in proof of this:—

"In the city of Buffalo, where there was fearful mortality from the epidemic of 1849, its principal ravages were witnessed in the filthy and undrained sections of the city, and in the purlieus of poverty, vice, and fevers along the canal. In Sandusky, where nearly one-third the resident population died in a single month, Dr. Ackley states that a stench pervaded the streets. At Louisville, Ky., the centers of the epidemic were associated with filth, malaria and crowding. In Cincinnati, where the epidemic killed 5,314 persons, out of a population of 116,108, it was first associated with local filth and crowding. In St. Louis, 4,557 inhabitants perished out of 50,000. Dr. McPheeters reported that the epidemic elected as its chief centers the crowded tenant buildings, the streets and dwellings alongside the stagnant ponds and open ditches that then abounded in that city; also that seven-tenths of the mortality was among the German and Irish population. In New Orleans, when the epidemic appeared, the streets and gutters were filled with filth so that even the Board of Health declared that "the elements of putrefaction had accumulated fearfully in every direction, until the atmosphere was polluted by poisonous exhalations in which a sickly acid smell predominated."

The report then cites numerous proofs that by proper attention to cleanliness, the pestilence may be avoided; we select two of these:—

"In various towns and cities of England, the actual benefits of preventive measures, the sanitary works of cleansing, drainage and ventilation, have been fully tested. For example, the city of Worcester, on the river Severn, having been twice scourged by cholera, undertook to avert the later epidemics by means of effectual cleansing and efficient sanitary regulations. The result was, that while the pestilence swept through the neighboring cities and villages, the populous city of Worcester escaped, "and the destroyer of uncleanly cities made a passover with the people of Worcester, for on every lintel and door-post was written, 'cleanliness, cleanliness.' Not a house was entered, and the town was saved in the midst of the most frightful desolation."

"In Philadelphia the cholera broke out and made some progress in the districts of Moyamensing and Southwark, where the work of cleansing was incomplete. But the citizens had anticipated the coming pestilence by the most comprehensive and energetic effort to effectually purge their city of all nuisances, and all the known causes that produce or localize disease; 2,970 privies were cleansed; 340 houses were cleaned by authority; 188 ponds were drained; 66 rag and bone shops were closed, etc., and in all the city removed upward of 6,000 separate sources of nuisances and disease. Cholera sent but 474 persons to their graves in Philadelphia, while in the city of New York it claimed 5,071 dead."

Is there not in this energetic community, sufficient energy, is there not among this provident people enough provident spirit, to arouse us to take hold of the work, and avert this awful pestilence, when it can be so surely done?

RECIPROCITY WITH THE CANADAS.

It is represented in one of the morning papers that the committee on reciprocal relations with the Canadas have nearly agreed upon a basis for a new treaty.

The people of the States have no unkind feelings toward the Provinces, and will not oppose any well-adjusted system of reciprocity. We only need to be assured that the treaty is really one of reciprocity, and no opposition will be made to its ratification. We desire to call the attention of the committee having the matter in charge, to the importance of securing, among other things, reciprocity in regard to patents.

The Canadian Patent Law is now the most illiberal in existence, requiring, as it does, that all applicants

for patents shall be resident subjects as well as inventors of the things for which patents are sought. This practically excludes our citizens from the benefit of the law, and leaves our neighbors over the line free to appropriate our inventions without let or hinderance. Efforts have been made, from time to time, to secure an amendment to this unjust law, but to no purpose.

We have been regularly consulted, for years past, in reference to a bill to amend the Canadian patent laws, so as to open the door to inventors of all countries, but our advice has been wasted upon a set of sharp legislators who evidently preferred to allow their people to help themselves to whatever valuable inventions they could pick up on this side of the line. Now, inasmuch as there seems to be no prospect of getting a reciprocal law, let us, by all means, secure it by reciprocal treaty. We trust that the committee will not overlook this important subject.

EXHIBITORS AT THE FRENCH FAIR.

Mr. James W. Tucker, a citizen of the United States, but for many years past doing business as banker and commission merchant at No. 13 Faubourg, Montmartre, Paris, is now on a visit to this city, and intends to offer his services to all those who propose to exhibit at the approaching French Exposition. We have known Mr. Tucker for many years, and can vouch for him as a gentleman of high character. Every thing indicates that the exhibition is to be one of the wonders of the world. And it is especially important to those of our countrymen who intend to send articles for exhibition, that they should have a good representative in Paris—one who thoroughly understands the country and its language. Mr. Tucker may be addressed to the care of W. A. & M. White, No. 63 Broadway.

PETROLEUM AS FUEL.

On another page we publish an illustration of a new plan for burning petroleum by mixing it with steam. In connection with the illustration is a statement by Mr. Julius W. Adams of an experiment conducted by him, which gave a result of 29 1/2 pounds of water evaporated from a temperature of 60° with one pound of petroleum: equal to 32,820 pounds of water raised one degree of Fahrenheit's scale, or 18,233 pounds raised one degree of the centigrade scale. In the delicate experiments of Favre and Silbermann, where the whole heating power of the fuel was utilized, it was found that pure hydrogen gas would heat only 34,462 times its weight of water one degree, C., while hydrocarbons, similar in constitution to petroleum, heated only 11,858 times their weight of water one degree, C. As in Mr. Adams's experiments, a large portion of the heat generated was wasted by passing out of the chimney, and by radiation, it would be satisfactory to receive a more minute account of the methods by which he reached his astonishing results.

PROSPERITY AND ADVERSITY OF INSURANCE COMPANIES.

The insurance companies of this city received during the fiscal year ending June last the enormous sum of \$27,513,582 for premiums on the policies issued from their offices. This amount does not include the great number of offices in Brooklyn, Hartford, Philadelphia and other places, who have agencies in this city, which would swell the amount many millions more.

Notwithstanding this apparent prosperity of the insurance business in this city, the losses during the year preceding July, 1865, were immense. The Columbian Insurance Co., notwithstanding its annual receipts of upward of four millions for premiums, has been obliged to succumb within a few days, owing to the immense marine losses sustained by it.

Some of the oil companies of Pennsylvania make a deplorable exhibit to the Auditor-General. The law requires them to assess their stock at a valuation so that the tax can be adjusted. The same stock which a few months ago was represented to be cheap at ten dollars per share, is now valued by the same directors at five cents per share, and at this last assessment many of the taxes are computed and paid.