

A NEW POTATO DIGGER.

We illustrate herewith a novel potato digger recently patented by Mr. H. Strait, of No. 18 Sixth St., Troy, N. Y. Its new features will be readily seen by reference to the engraving. The plow, A, which runs under the potato hills, has a vertical standard that runs upward through a guide in the frame, and is connected by links with the lever, B, which is fulcrumed on the tongue. The free end of this lever passes through a slide that carries a spring latch, and is movable on a vertical standard, C, that is supported by the machine frame. Behind the plow, A, there is a toothed cylinder, D, that is journaled in two arms, E, pivoted to opposite sides of the frame. The cylinder, D, as well as its teeth, are of hard wood. The ends of the cylinder shaft carry pinions that are engaged by internally toothed flanges on the inner faces of the drive wheels. The upper ends of the arms, E, are pivoted to a fork having two mortises, either of which may be placed over the standard, G. By means of this fork the pinions of the tooth cylinder are thrown into and out of gear. Behind the toothed cylinder there is a series of curved tines, H, which alternate in position with the teeth of the cylinder, D.

As the machine is drawn forward the earth is loosened by the plow, and the potatoes are separated from it by the revolving toothed cylinder. The tines, H, prevent the vines from winding on the cylinder, and also prevent the potatoes from being thrown upward by the teeth. It is claimed by the inventor that the machine is very effective in its operation.

For further information address the inventor as above.

THE MANUFACTURE OF LARD.

American refined lard, as an article of export, will overreach the round sum of \$30,000,000 per annum, ranking the sixth in value out of \$600,000,000 of American exports. It is exceeded only by cotton, breadstuffs, petroleum, tobacco, and bacon.

The American lard of the brand of "W. J. Wilcox & Co.," made in New York city, has received the gold medal at the Paris Exhibition for its excellence, being the only gold medal awarded for lard. It was given for uniformity of color and body, sweetness, and superiority of preparation for exportation. The annexed engraving represents the lard exhibit of W. J. Wilcox & Co. at the Paris Exhibition.

At the Centennial Exhibition the company received the highest award and prize medals for the purity of their various productions.

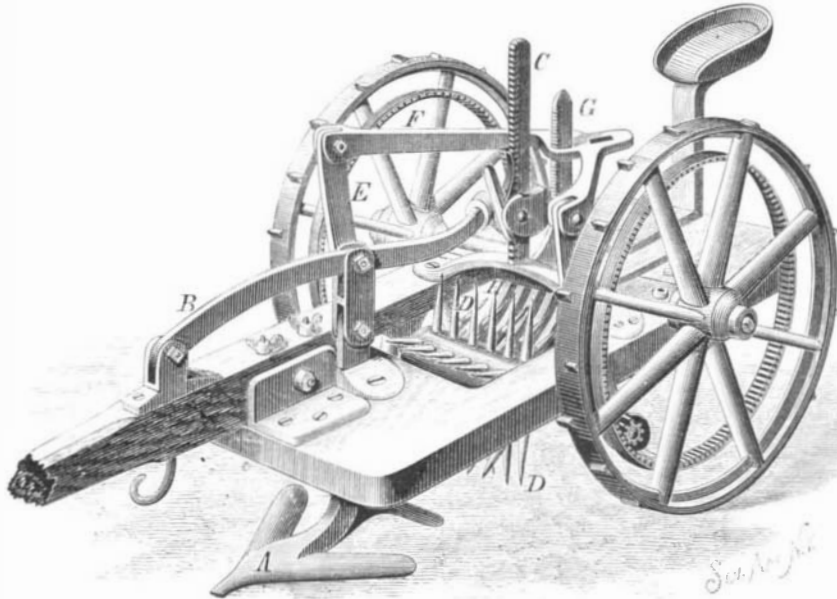
It is said that the Wilcox lard forms about one half of the entire shipment of that commodity from New York; and of the nearly one and a half million tierces annually exported from the United States, two thirds of the total amount go from the metropolis. This immense foreign demand gradually increases every year, and the domestic consumption constantly grows larger.

Though still doing business under the original firm name of W. J. Wilcox & Co., the concern has, for several years, been an incorporated company, with the following officers: Mr. William A. Cole, President; Mr. Samuel E. Hiscox, Vice-President; Mr. E. T. Bell, Treasurer. The entire stock is owned by these gentlemen, who are virtually in copartnership.

The refinery of this concern is very extensive, covering a large area of the block bounded by Greenwich, Washington, and Vestry streets. There are also extensive premises in West Twelfth street. Altogether there are about three hundred workmen employed. The works are completely provided with the most approved modern machinery, of which the company are the inventors and owners.

The crude material, which is constantly arriving, is most rigidly inspected, and any portion of it that fails to meet the required standard of taste, color, and consistency, is promptly condemned and removed. The approved stock is then emptied into enormous kettles, some of which have a capacity of 75,000 lbs. The kettles being filled, sufficient heat is applied until the mass is thoroughly cooked, after which

it is transferred to coolers. At this stage of the process certain methods peculiar to the Wilcox Company are applied, which render the lard white, sweet, pure, and uniform in texture and quality. The next process is to run it through the pipes into huge tanks placed in the sub-cellars. Thence it is drawn off in vessels varying from a 1 lb. tin can to a 320 lb. wooden tierce. All these packages, when filled, are carefully cleaned from all outside drip; they are then weighed



STRAIT'S POTATO DIGGER.

and branded—the smaller sizes being packed in cases. It is stated that there is not a country in the world to which the refined lard of Wilcox & Co. does not go; there is not a commercial city in continental Europe in which its price is not specifically quoted each day, to the exclusion of all other productions; and the manufacturers assert there is not an instance known of a shipment having been defective in quality, short in weight, or in any degree of perfection below the standard.

The offices of the concern are located at 41 Broad street, New York city, and are in telegraphic communication with the works. A wire connecting with the Western Union Telegraph Company's main office delivers domestic telegraph advices, and cable news from all parts of Europe.

Superb Photographs.

We are indebted to F. Gutekunst, the well known photographer in Philadelphia, for copies of excellent photographs

Preservation of Butter.

The Italian Minister of Agriculture, Industry, and Commerce has addressed a communication to the Chamber of Commerce of Milan relative to the renewed experiments in salting butter with borax which have been carried out at the Agricultural Station at Florence. From the account which appears in our contemporary, the *Giornale di Agricoltura*, borax would appear, says the *London Grocer*, to have a most marvelous effect in insuring its absolute preservation. Samples of fresh butter made at the Florence station, and purposely not carefully freed of their buttermilk, were found, on the addition of about 8 per cent. of borax, to maintain their natural fine flavor without the least change whatever for upwards of three months. To attain this satisfactory result it is necessary that the borax should be perfectly dry and in very fine powder, and care must be taken to insure its thorough mixture with the whole mass of the butter operated on. Among the further advantages of this plan, it is noted that borax imparts no flavor of any kind to the butter, while it is entirely harmless in its nature, and also reasonably cheap. Still later experiments have shown that a very much smaller proportion of borax suffices to produce the desired effect, and, also, that simple solutions of the salt act quite as well as the dried powder.

[We cannot recommend our agriculturists to enter largely into the substitution of borax for salt in butter for house

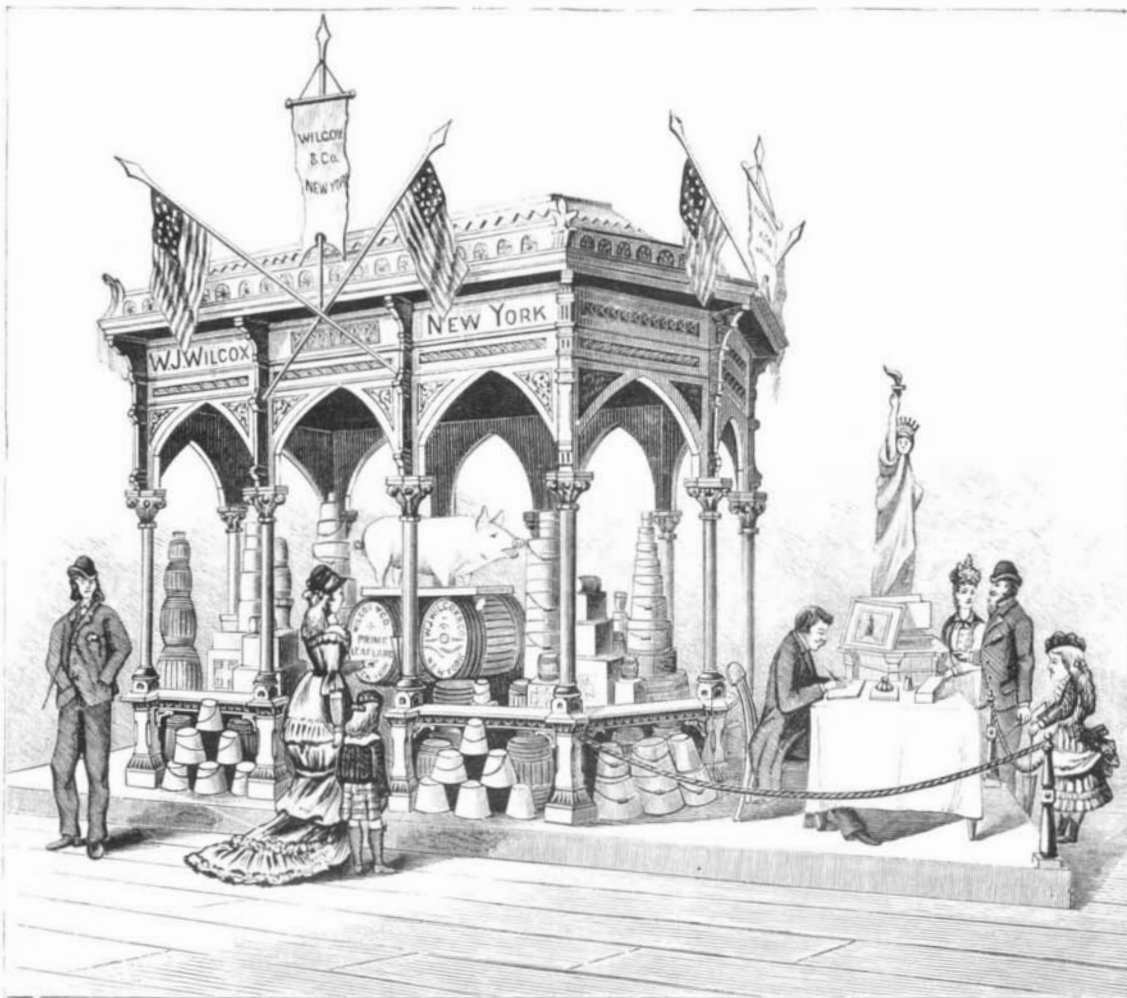
use, but it may be well for some to try the experiment on a small scale.

The consumers on the Continent are averse to salted butter, and likely they may prefer borax as a preservative, while our people will adhere to their salt.—ED.]

To Render Wood Incombustible and Impermeable.

According to the *Timber Trade Journal*, M. M. P. Folbacci claims to give these properties to wood by means of the process described below. It thus becomes petrified, so to speak, without, however, undergoing any change of appearance. On being subjected to intense heat it becomes charred on the surface, but very slowly and without any flame, and it is only necessary to scratch the surface to find the substance of the wood intact. Hence in case of fire, the firemen would have no occasion to fear that the materials on which they tread would give way beneath them, if this operation has

been undergone by the wood composing staircases, floors, etc. The following chemical compound is said to produce the result: Sulphate of zinc, 55 pounds; American potash, 22 pounds; American alum, 44 pounds; oxide of manganese, 22 pounds; sulphuric acid of 60°, 22 pounds; water, 55 pounds. All of the solids are to be poured into an iron boiler containing the water at a temperature of 45° C., or 113° F. As soon as the substances are dissolved the sulphuric acid is to be poured in little by little, until all the substances are completely saturated. For the preparation of the wood it should be placed in a suitable apparatus, and arranged in various sizes (according to the purposes for which it is intended) on iron gratings, care being taken that there is a space of about half an inch between every two pieces of wood. The chemical compound is then pumped into the apparatus, and as soon as the vacant spaces are filled up it is boiled for three hours. The wood is then taken out and laid on a wooden grating in the open air, to be rendered solid, after which it is fit for uses of all kinds, as ship building, house building, railway carriages and trucks, fence posts, wood paving, in short, for any



W. J. WILCOX & COMPANY'S EXHIBIT AT THE PARIS EXHIBITION.

of the late Bayard Taylor and Morton McMichael. The former was the American Minister to Berlin, and the latter, the proprietor and editor of the *North American Newspaper*.

THE shipment of American oysters to England is now carried on to the extent of from 1,200 to 1,500 barrels a day. On December 7 nearly 2,600 barrels were shipped for the Christmas trade.

kind of work where there is any liability to destruction by fire.

Mining Notes.

As mining investments continue to attract increasing attention in the East, New York is becoming the great mining exchange of the country, where the idle capital of the East, seeking investment, and the mineral riches of the West and South seeking development, meet to build up enterprises that

in the aggregate promise in a few years to add more to the wealth of the country and give more profitable employment to labor than any other one industry now pursued here.

There is scarcely a good mining property that is not now represented in New York, and there is hardly a newly discovered mine east of the Pacific coast range that does not seek for capital here.

It is unavoidable that some purely speculative enterprises should be offered side by side with legitimate ones, that some swindling operations should be successful; but the means are daily multiplying, the system is daily improving, whereby it will be possible to give to each its rightful rank, so that proposing investors may make their choice.

Southern gold mines are now attracting much attention, and it is reported that eleven of the North Carolina and Georgia gold mines were sold to New York parties a week or two since, and that contracts are being negotiated for many of the best mining properties in these sections.

From the Eagle Gold Mining Co., Stafford county, Virginia, comes a report that the vein is from 14 inches to 6½ feet thick, and that the shaft has been sunk 160 feet. Before the war it is said the mine yielded 13 ounces of gold for every \$25 paid for wages; now it yields 16 ounces for the same outlay. The Findley Mine, Georgia, has just paid a small dividend, and expects to pay another this month, from surplus earnings. A number of individual enterprises in the South are reported as doing well on the capital invested.

The profitable development of the majority of the Southern mines would have been impossible a few years ago; improved machinery and processes and mining knowledge gained by costly experience have, however, made these and many poorer properties present good investments.

The Homestake Mine, of Dakota, covering 1,350 feet by 450 feet on the mineral vein, has ordered 120 stamps for spring work in addition to the 80 now in operation. The present gross production of the company is about \$60,000 per month, and regular dividends seem to be assured for a long time to come.

The silver production of Leadville, Colorado, exceeds all expectations, and new discoveries are daily reported. The product of the leading mines has increased 50 per cent within the past few weeks. Two thousand tons, yielding 20,000 ounces of silver, were delivered last week, and 3,000 tons of high grade were awaiting transportation. It is estimated that the product of the camp for the year 1878 will reach \$3,000,000.

In Idaho placer mining on the Snake, Boise, and Fayette rivers and their tributaries is being vigorously resumed, because of recent improvements in processes for securing the fine gold, and most satisfactory results are anticipated. The working mines of Idaho are, in general, doing well.

The Ontario Silver Mining Co., of Utah, since the commencement of operations in September, 1874, has paid in dividends to stockholders \$1,900,000, and its development is still progressing. The Stewart Gold Mine, located in the Bingham district, has been incorporated with capital stock of \$6,000,000, and the results of its workings are thus far so satisfactory that additional stamps are being erected.

Several valuable quartz claims have recently been discovered in Calaveras and Tuolumne counties, California, promising to be richer than any preceding discoveries, and a revival of prosperous times is confidently anticipated there. From many other counties in California cheering accounts of mining conditions are received from Mono, Amador, San Bernardino, Contra Costa, and others, and everywhere there is evidence that we have much more to learn of the mineral wealth of the State. The Idaho Mine, of Grass Valley, Cal., yielded \$47,000 worth of gold in October, and the 111th dividend was paid, making a total distribution of \$2,510,000. In 1870 this mine was offered in England for £20,000.

Nowhere are richer ores found than those constantly reported from Arizona, and so important are the mining interests there now that it cannot be long, we think, before some way is discovered to escape from dependence on San Francisco reduction works.

The Comstock Mines, of Nevada, are with scarce an exception promising better returns than for many months past; but as public faith in them departed with the late disastrous stock speculations in San Francisco, other mines are preferred for investment.

At no time has there been so universal an interest in mining enterprises as is now manifest in every direction. The snags and quicksands having been well defined by their predecessors, the miners and investors of to-day need only to exercise ordinary caution to safely arrive at desired results.

THE YIELD OF PRECIOUS METALS IN 1878.

Wells, Fargo & Co.'s annual statement of the precious metals produced in the States and Territories west of the Missouri River, including British Columbia, and the receipts in San Francisco from the west coast of Mexico during 1878, show the aggregate products to be as follows: Gold, \$38,956,231; silver, \$38,746,391; lead, \$3,452,000—the total being less by \$17,267,132 than for 1877. California shows an increase in gold of \$2,068,000, but a decrease in silver, etc., of \$1,323,000. Nevada shows a total falling off of \$16,398,341, the yield from the Comstock being only \$21,295,043 as against \$37,911,710 for 1877. Montana shows a marked increase, all in silver. Utah shows a falling off of over \$2,000,000, but nearly \$1,000,000 of it is caused by reduced valuation of silver and lead bullion. Although Colorado shows \$1,680,802 less than for 1877, the yield has been really greater, as the reports for 1877 duplicated the product of certain localities, but the duplication was not discovered

soon enough to be corrected in the statement for that year. The production by States and Territories is as follows:

California.....	\$18,920,461
Nevada	35,181,949
Oregon	1,213,724
Washington	73,311
Idaho	1,868,122
Montana	9,763,640
Utah.....	6,064,613
Colorado.....	6,232,747
New Mexico	453,813
Arizona.....	2,287,983
Dakota.....	2,215,804
Mexico (west coast).....	1,594,995
British Columbia	1,283,460

The bullion from Comstock lode contained 45 per cent of gold and 55 per cent of silver. Of the so-called base bullion from Nevada, 30 per cent was gold. Of the whole product of the State, 35 per cent was gold. It is probable that the yield of gold and silver from all sources named for 1879 will not greatly exceed \$70,000,000.

Correspondence.

The American Middlings Purifier Company.

To the Editor of the Scientific American:

In your last number you quote, with a head note indicating entire sympathy, an article from the *American Miller*, which records two decisive defeats recently sustained by the American Middlings Purifier Company—one before Judge Blatchford, against Vail, Shotwell & Co., and one in Richmond, Va., against the Haxall-Crenshaw Company.

Now as to the facts. In the case of Vail, Shotwell & Co., Judge Blatchford granted the injunction instead of refusing it, the difference being that the plaintiffs prevailed instead of the defendants. It might be of interest to you to know more of the particulars concerning this decision. The case was before the court upon an interlocutory motion for an injunction, not upon the final hearing. The defense was conducted by the Millers' Association, it paying the expenses for experts, attorneys, etc. The argument was thorough and exhaustive, continuing through several weeks, as it was a test case for that circuit. After this elaborate argument the case was taken under advisement, and before the judge had prepared his opinion the defendants filed an *ex parte* suggestion to the effect that they had become insolvent and did not intend to resume the manufacture of flour, and withdrawing objection to the issuing of the injunction as prayed for.

The decisive victory achieved by the defendants was, that by this timely surrender they prevented Judge Blatchford from filing an opinion sustaining the patents. The bad faith of their course is apparent from the facts that the suit, although in form against Vail, Shotwell & Co., was really a test case against the Millers' Association; that the defendants were no more insolvent when the surrender was made than when the case was argued; and that the expenses incurred by the Association far exceeded any damages which could have been recovered in the particular case. In other words, this is only one of the tricks by which infringers hope to exhaust the purse and the patience of the patentee whose rights they ignore.

The other decisive victory is found in the fact that a bill was filed against the Haxall-Crenshaw Company, and an answer put in; there it rested. Some months ago the defendants obtained an *ex parte* rule on the plaintiffs to file security for costs or show that they were carrying on business in the State. The rule not having been served on the plaintiffs, and their attorney having no knowledge of it, the cause was dismissed for non-compliance. Of course such an order would be set aside upon motion, but no evidence having been put in upon either side, the plaintiffs preferred the less troublesome and less expensive course of filing a new bill, the costs being about \$12.

It is upon such chaff as this that the milling journals feed their subscribers, and from which they manufacture great triumphs; because they are the organs of the millers' associations, and these associations must constantly stimulate their members to pay their subscriptions, which are for the avowed purpose of resisting payment for any patent, of any kind, for any purpose, connected with their business.

Why the SCIENTIFIC AMERICAN should sympathize with these objects I cannot understand. They are simply combinations of manufacturers who extensively use patented machinery to defeat the claims of all patentees.

If you think that the so-called "Cochrane ring" is composed of such bad men, or has pursued such an evil course, or owns such vicious patents as to place them outside of ordinary laws and rules, I would be glad to disabuse your mind in those particulars.

The whole of their offense is that they hold patents which are being infringed in several thousand mills. The infringers are numerous, influential, and arrogant. They act upon the maxim adopted by other powerful combinations, that it is cheaper to fight patents than to pay for them.

I send you a list of the persons who compose this company. A very little inquiry will satisfy you as to who and what they are.

The course pursued by them has been to endeavor to collect a very small compensation for the use of their patents. When this was refused they sued an infringer of large wealth who was well able to defend himself, and who owned adverse patent interests of great value. The case was tried and the Cochrane party were beaten. Thereupon they appealed to the United States Supreme Court, where all of

their positions were sustained and the patents fully vindicated. They renewed their efforts to obtain from millers about one hundredth part of what would be due on a strict accounting. The charge was then made that the former decision in their favor had been obtained by collusion. This charge they promptly met, and the Supreme Court, after a thorough investigation, reiterated its opinion as to the validity of the patent, and said, "We see no ground to believe that the appellants are chargeable with any collusion with the appellees in this case in reference to the argument of the appeal. On the contrary, the weight of the evidence is that they repelled any arrangement or proposition which might look to that end."

All compensation having been denied them, they commenced suits against about half a dozen parties who were representative men, and one or more of these suits have been diligently prosecuted for the purpose of finally settling every question which it was alleged had not already been passed upon by the Supreme Court. All the others of the milling fraternity have been left undisturbed, unless it be by their own consciences. No miller who has offered to settle, even upon the most absurdly low terms, has had his offer refused.

Mr. Cochrane, the inventor and patentee of this new process, found that he was utterly powerless to cope with an army of infringers; he, therefore, associated with him a few persons who could provide the means for carrying on the expensive litigation which must ensue unless he abandoned all of his rights. Out of this has grown the cry of the "Cochrane ring."

If the inventor stands alone, he is pushed aside as of no account whatever. If he obtains assistance to vindicate his rights, he is met with the cry that an infamous ring is trying to oppress and plunder the poor manufacturers.

In sober truth, the persons denounced in the article you quote are fighting not their battle alone, but the battle of all inventors. If they should conclude that the odds against them are too great for successful resistance, and give up the unequal contest, what will have been gained and lost? Merely this, that the story of Whitney and his cotton gin will be once more repeated, and the rule again established that the more valuable an invention is to the public, the less beneficial it is to the inventor. If a person devises something which meets the wants of a multitude of persons, they can help themselves to the fruits of his labor and combine to resist any demand for compensation, however moderate, and ruin him by litigation in which he must bear all of the expenses of one side of the contest, while those of the other side are divided among several thousand.

It is a mistake to suppose that these combinations are directed especially against the Cochrane patents because there is something exceptionally obnoxious about them. They are merely associations of those engaged in an important branch of industry to resist by their joint action all attempts to compel any of them to pay for the use of any patent. These particular patents are more extensively infringed than any others, and therefore the opposition to them forms a bond of union for a larger number of persons who are animated by this spirit.

A candid examination of the facts will satisfy you that there was never a case where the owners of a patent had better grounds for believing in the entire justice of their cause, where their demands were more moderate or have been urged in a greater spirit of forbearance and conciliation.

Of course it is within the limits of possibility that the Cochrane patents are invalid, or that some of the parties we have sued do not actually infringe them. These are the chances of litigation which we must take; but what we protest against is that a body of men, who are charged with being infringers, should by "damnable iteration" be able to induce those who are in the main friendly to patents to believe that there is something disreputable in a patentee associating with him honorable gentlemen, for the purpose of asserting his rights and vindicating his patents against those who are too strong for him to resist single handed.

Very respectfully, your obdt. servant,

CHAS. F. PECK,

Secretary of the American Middlings Purifier Company.
Washington, D. C., Jan. 6, 1879.

Steam for Thawing Frozen Earth, etc.

To the Editor of the Scientific American:

As you suggested the use of steam for thawing frozen ground, I thought you might feel interested in the following experiments.

The chief of our fire department recommended the construction of a portable boiler, with a suitable nozzle and tube connection, for thawing out the fire plugs. He also stated that it would be useful in excavating trenches for repairing service branches. The city plumber did not believe that it would be. Both were positive, and a wager and trial were the result.

A nozzle of ¾ inch gas pipe, reduced to ¼ inch at the point and formed like a cross at the top, for convenience in handling it, was attached, by rubber hose, to the boiler used for heating the water in the steamer of Company 1. In 30 minutes after steam was first turned on they had a hole 8 inches by 12 inches through the frost. Steam was used at about 35 or 40 lbs. There was one inch of frozen snow on the bricks, and the ground was frozen for a depth of 2 feet. The thermometer stood at -6° in the morning, but had risen to 15° above zero at the time of the trial. The hose coupling parted twice, which caused the loss of a few minutes.

Newport, Ky., Jan. 10, 1879.

C. P. B. Jr.