The bars being polished and their edges rounded off, the beer always runs underneath and drops on the middle of the next one. Consequently, though very hot when it leaves the jets, it is quite cool when it reaches the trough at the bottom from which it is conducted through copper pipes to the fermenting vats. This apparatus will cool 120 barrels in an hour. By the way, there are nearly twenty miles of copper piping in the building.

"The foam caused by the fermentation of the beer, after the yeast has been mixed with it, assumes fantastic and even very beautiful shapes. Sometimes it resembles undulating slopes of smooth fresh snow; sometimes it works into masses like drifts of snow, and, again, it will assume the rugged, riven, appearance of a Swiss glacier. And, to add to the simile, there are constant avalanches of the foam in consequence of the continual escape of small quantities of the carbonic acid gas which sustains it.

"Six or eight inches above the suface of the foam, the gas is so powerful as to produce asphyxia in a very few seconds. Brewers have often lost their lives by carelessly inhaling it. Over the tun room, as it is called, there is an immense ice house, one of Brainerd's patent refrigerators, 150 feet by 11 feet, and 14 feet high. By a simple arrangement the cold strikes down, and in the hottest summer weather the beer is kept perfectly cool. The store rooms, three in number, hold together 8,000 barrels of beer. Last year the brewery sent out 50,000 barrels of beer and 12,000 barrels of lager beer. It is a common occurrence for the firm to pay $300 or $400 in one day to the Government for stamps. The ale from this brewery is shipped to all parts of the State, more especially the central and western divisions.

"Adjoining Mr. Greenway's great brewery are the Syracuse Flour Mills, owned by J. W. Barker & Co. The mill, which is built of red brick, is 140 feet by 80 feet, and has five stories and a basement. It is run almost entirely by water power, though it is provided with an auxiliary engine of 100 horse power. Under an old lease, granted twenty-five or thirty years ago, the proprietors are empowered to use the surplus water of the Erie Canal for driving their machinery. A stone wall, built into the bank of the canal, at the hight established by law, prevents the use of the water when the canal is low. The engine has been in use for one month this fall, in consequence of the extensive dryness of the season, but previously it had only been used in the aggregate six weeks during the five years which have passed since its erection. The water, after driving the wheel passes through the mill and runs away into the Onondaga Creek. The granaries of the mill have a storage capacity of 80,000 bushels of wheat, and the nine run of stones grind about 1,400 bushels a day.

"The wheat is passed from the granaries to the grind stones on a "carrier" similar to that in use in Mr. Greenway's brewery. The flour falls from the stones into receptacles below, from which it is carried by elevators to the cleaning and winnowing floors. There it is passed through four revolving cylinders, one within the other, made of very fine hair sieve cloth. These cylinders are erected at a slight incline, so that the flour and impurities are constantly passing out of them; the flour to the stores over the packing room, the impurities to the waste room.

The flour is barreled by a very simple contrivance, called the "packer." From the stores above, a large pipe runs down to within about four feet of the ground, the bottom of which will just fit the top of a barrel. The barrel after being weighed, is placed on an iron stool and raised by machinery to the pipe. The filling machinery is then set in motion. A small governor, which can be regulated to any weight, detaches the barrel, by letting the stool fall till the bottom of the barrel is level with the floor, as soon as the required weight of flour is in it. At the same time it closes the mouth of the supply pipe. The barrels of flour are at once shipped, as the firm have always as many orders on hand as they can fill. They generally ship about four hundred barrels a day, and averaging ten months running throughout the year, sell from forty thousand to forty-five thousand barrels a year."

REPORT OF EXPERIMENTS FOR TESTING THE RELATIVE VALUE OF LUBRICATING OILS.

BY A. H. VAN CLEVE.

An experimental shaft with journals seven inches long, six inches diameter, was carefully fitted to brass bearings, supported by cast iron frames secured to a suitable foundation. A spur wheel attached to the center of the experimental shaft was geared to a pinion wheel, on the center of a driving shaft, with its bearings also attached to the cast iron frames.

A set of scale beams, arranged to apply any required pressure (within their capacity) to the lower half of the brass bearings, were also accurately fitted to the cast iron frames and foundation. The experimental shaft was driven by a five horse power oscillating engine, at a given number of revolutions per minute, on each experiment.

The velocity was determined by a counter attached to the end of the shaft. The brass bearings of the experimental shaft were kept at an average of 96° Fahr., which was determined by thermometers, inserted through them to within three eighths inch of the journals. An oil cup was placed over each bearing, graduated to fractional parts of a gill. A thermometer, to determine the temperature of the oil when applied, was placed in each cup. The experiments proved that the consumption of oil varied with its temperature when applied. The quantity of oil applied per minute was varied at intervals, as was required to keep the bearings as near 100° Fahr. as possible, as abrasion of the metals took place when it rose above that point. The total consumption of oil, at the close of each experiment, was averaged with the number of hours occupied in making the experiment. The pressure upon the journals was varied, for each kind of oil, as was necessary to preserve the uniform temperature of 96° Fahr., at the required revolutions of the shaft per minute on each experiment.

Hence, the number of square feet of the journal's surface travelled per minute, the pounds pressure upon them, and the quantity of oil applied, determined the lubricating value of the oil. The method of applying the pressure by the scale beams accurately indicated the power consumed by the engine to keep the shaft in motion during the experiments with each kind of oil.

A second series of experiments was made. (See Table No. 2.)

A shaft, with journals 6 inches long and 2¾ inches diameter, was fitted in place of the 6 inches diameter and driven at a corresponding number of revolutions per minute, for the purpose of testing the value of car box oils.

The experiments on each shaft were conducted with the same care, with corresponding results.

RESULTS.

The accompanying Table (No. 1.) exhibits the results of several tests, from which it will be seen that winter sperm oil, from three houses, sustained the heaviest pressure, and the best of them was taken as the initial of comparison for all others, and their per cent of lubricating value determined by it. The tests of mineral oils and mixtures of animal and fish oils with them would not sustain an equal pressure with the sperm, when equal quantities of the oil were applied, without rapidly increasing the temperature of the journals, and producing an abrasion of their surfaces.

The experiments, as shown by Table (No. 2.), on car box oils, with a shaft having bearings 2¾ inches diameter, by 6 inches long, also proved that when the pressure on the bearings was made equal with winter sperm, it required from 100 to 400 per cent increase of oil, to keep the temperature of the journals below 100° Fahr. In no instance could the pressure on the car shaft be raised to 8,000 pounds (with mineral oils), it being the average pressure on an axle of a loaded coal car. Hence, it is to be inferred that the expenditure of locomotive power, and the cost of repairs on all loaded trains, must be in ratio with the quality of lubricating material applied.

Experiments were made at varied velocities, (see Table No. 3.) with the same oils. The results proved that as the velocity was reduced the pressure could be increased, and the relative consumption of oil, applied at equal temperatures, was decreased in almost equal ratio.

The experiments were continued during a period of fourteen months, on the oils purchased for the Camden & Amboy Railroad Company's use; the following results are deemed sufficient for illnstration:

TABLE No. 1.

With Locomotive Axle Bearings, 6 in. diameter, 7 in. long.

KIND OF OIL, PURCHASED OF VARIOUS DEALERS.	Revolutions of shaft per min.	Pressure on journals—pounds	Temperature of bearings—Fahrenheit	Applied per hour gills	OIL. Per cent of lubricating value less than winter sperm	OIL. TEMPERATURE UNCHANGED: Began to thicken	Too thick to run	Congealed at	Horse power of engine [illegible]
Winter Sperm	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	26°	[illegible]	[illegible]
Winter Sperm	[illegible]	[illegible]	[illegible]	[illegible]	.04	[illegible]	[illegible]	[illegible]	[illegible]
Winter Sperm	128	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Engine Oil	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	31°	[illegible]	[illegible]	[illegible]
Engine Oil	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	18°	[illegible]	[illegible]
½ Winter Sperm, ½ Lard	121	[illegible]	[illegible]	[illegible]	[illegible]	...	...	...	2.61
¾ Winter Sperm, ¼ Lard	121	[illegible]	[illegible]	[illegible]	.31	...	...	...	[illegible]
¼ Winter Sperm, ¾ Lard	132	[illegible]	[illegible]	[illegible]	.30	...	...	...	[illegible]
Engine Oil	[illegible]	[illegible]	[illegible]	[illegible]	.45	...	...	...	[illegible]
Mason's Sperm	[illegible]	[illegible]	[illegible]	[illegible]	.45	...	...	...	[illegible]
Lard Oil	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	...	...	...	[illegible]
Engine Oil	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	...	...	...	[illegible]
Engine Oil	[illegible]	[illegible]	[illegible]	[illegible]	.71	...	...	...	[illegible]
Engine Oil	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	...	...	...	[illegible]
Engine Oil No. 2	126	[illegible]	[illegible]	[illegible]	.82	...	...	...	[illegible]
Engine Oil	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	...	...	...	[illegible]
Refined Mineral	127	[illegible]	[illegible]	[illegible]	[illegible]	...	...	...	[illegible]

TABLE No. 2.

With Car Axle Bearings, 2¾ in. diameter, 6 in. long.

	Winter Sperm	251	7001	95°	.25	.09	28°	[illegible]	[illegible]	3.18
	Car Box Oil	[illegible]	[illegible]	[illegible]	.17	.35	17°	[illegible]	[illegible]	2.08
MINERAL	Car Box Oil	235	[illegible]	[illegible]	.15	.40	31°	[illegible]	[illegible]	1.91
MINERAL	Car Box Oil No. 1	241	[illegible]	[illegible]	.15	.44	20°	[illegible]	[illegible]	1.75
MINERAL	Car Box Oil No. 2	240	[illegible]	[illegible]	.15	.43	13°	[illegible]	...	1.81
MINERAL	Car Box Oil No. 3	245	[illegible]	[illegible]	.15	.43	16°	[illegible]	13°	1.79
MINERAL	Car Box Oil No. 4	232	[illegible]	[illegible]	[illegible]	.66	28°	[illegible]	[illegible]	1.09
MINERAL	Car Box Oil No. 5	245	[illegible]	[illegible]	.14	.45	15°	[illegible]	10°	1.76

TABLE No. 3.

With Locomotive Axle, at different velocities.

Winter Sperm	130	7000	97°	.40	...	...	...	...	...
Winter Sperm	100	7200	91°	.26	...	...	...	...	...
Winter Sperm	70	8000	94°	.18	...	...	...	...	...
Winter Sperm	60	9800	94°	.11	...	...	...	...	...
Winter Sperm	130	7000	98°	.36	...	...	...	...	...
Winter Sperm	100	7500	96°	.25	...	...	...	...	...
Winter Sperm	70	8000	91°	.19	...	...	...	...	...
Winter Sperm	60	9500	90°	.10	...	...	...	...	...
Engine Oil	130	6500	96°	.24	...	...	...	...	...
Engine Oil	100	7500	96°	.18	...	...	...	...	...
Engine Oil	70	8000	92°	.14	...	...	...	...	...
Engine Oil	60	9500	87°	.05	...	...	...	...	...
Lard Oil	130	[illegible]	98°	.31	...	...	...	...	...
Lard Oil	100	5000	95°	.18	...	...	...	...	...
Lard Oil	70	[illegible]	93°	.12	...	...	...	...	...

Rogers' Fire Kindlers--A Curious Invention.

Mr. Noah Rogers, of Thomasville, Georgia, has invented an automatic fire kindler, which is a curiosity in patented inventions. It is a machine so constructed as to enable the fire to be kindled by any one in another part of the house, and without getting out of bed.

A CORRESPONDENT of the *English Mechanic* suggests two new uses for india rubber. One is for springs for locks, especially on gates and in other places exposed to the weather; the other is for proportional measuring, and the mode of application for this purpose will be obvious to our readers.

Scientific Lectures to the New York Young Men's Christian Association.

The second of the above named series was delivered on Tuesday, November 28th, by Professor Doremus, the subject under consideration being "Fire and its Treatment." In the course of the lecture, Professor Doremus said:

Fire is the most awful exhibition given to man of the potency of the Creator, its power, either for good or evil, being incalculable. Various have been the theories held at different times as to the nature of heat. Lord Bacon maintained it was a mode of motion; the same view was held by Sir Isaac Newton, and in our own time the theory has been revived by a number of eminent chemists, chief among them Mr. John Tyndall who has written a book in defence of its truth. Fire had been considered by the ancients to be one of the elements; but this is not maintained at the present day, and we are in a certain sense at sea as to its proper place in creation.

We frequently read of instances where the leaves of trees, rustled by the blast, ignite and produce terrible conflagrations, such as have lately occurred in Wisconsin and Michigan, where whole forests were destroyed from this simple cause. On the same principle a body, traveling with great velocity, coming in contact with an opposing force, produces fire—as, for instance, a projectile striking against the side of a ship will send forth sparks of flame. The popular theories, which will be intelligible to all, relative to the production of this element are easily explained. It is by chemical means that we are daily mastering all the difficulties of science, and among them this principle of fire. If carbon or charcoal be exposed to the air it can easily ignite, and in the same way soft. In one year the Metropolitan Gas Company lost $125,000 by the burning of their soft coal when exposed to the air and in the same time twenty-eight of the coal ships which left Liverpool were supposed from the same cause to have been lost. Another great cause of fire is electricity, which has been fearfully illustrated by the destruction of Chicago. The air is surcharged with the electric force, and in such weather as we have at present this can be easily proved. If a person who walks a distance a day like this comes into a warm room, and rubs his feet for a length of time on a carpet or rug, in a short time the electricity will penetrate to the very tips of his fingers, and a match applied to them will ignite a flame.

This theory explains such phenomena as we read about in the papers in connection with the destruction of Chicago. People who lived long distances from where the fire was raging, who had no idea of moving to a place of refuge, suddenly discovered their houses on fire in a manner that seemed inexplicable to them. The truth of the theory is easily explained. Great fires, such as that one, create a strong current of electric air, which travels over great distances, frequently firing a city in places widely apart. The knowledge of this principle should create a counter element to prevent such disasters, and it is believed chemistry is able, with its comparatively limited knowledge, to suggest one. Apart from this, some valuable hints are being thrown out by men of science relative to the building of our cities. The long narrow streets are, it is said, very dangerous in the presence of a fire, short, broad streets on the European plan being much safer and less exposed to the action of the flames. Some improvements might be made in our Fire Departments. It has been suggested that, instead of water being solely depended upon as an extinguisher, a reservoir should be provided in all our larger cities, filled with either carbonic or sulphurous acid, which would be much more efficacious than water if pipes were connected with the reservoirs, leading to our large establishments. In case of a fire breaking out at any time, the mere action of turning on a valve and filling the burning apartment with the gas would extinguish the flames. The same method could be employed on ships at sea, and the disasters that are now so frequent could be easily prevented and controlled.

To Filter Alcohol.

The following method of filtering alcohol or its solutions is said, by the *Druggist's Circular*, to be very satisfactory, and to be used extensively in North Germany, where it constitutes one of the secrets of the trade. Clean, unsized paper (Swedish filtering paper is the best), is to be torn into shreds and stirred into the liquid to be clarified. The whole is then to be strained through a flannel bag, when the resulting liquid will be found to possess the utmost clearness and limpidity. A filter may also be made by spreading thin paper pulp evenly upon stretched flannel or woolen cloth. When dry, the cloth so coated will be found to give better results than the felts, etc., commonly employed as filters.

PROFANITY never did any man the least good. No man is richer, or happier, or wiser for it. It commends no one to any society. It is disgusting to the refined, abominable to the good, insulting to those with whom we associate, degrading to the mind, unprofitable, needless and injurious to society.

PUBLIC LIBRARY AT MONTREAL.—We learn with much pleasure that the Messrs. de St. Sulpice intend to open, at Montreal, a library where students can consult, gratuitously, works of art and science which are difficult to procure. Students in medicine and law especially, who are considerably hindered in their studies for want of books, will appreciate this liberality.—*Journal de l'Instruction Publique.*

GREATNESS lies not in being strong, but in the right use of strength.

Improved Pipe Leak Stopper.

This is a very practical invention, having for its object the stopping of leaks which frequently occur in metal pipes. In the use of steam, leaks in the pipes are of more or less frequent occurrence, sometimes owing to the bursting of the pipes from over pressure, and often in cold weather from the freezing of the condensed steam. The difficulty of making repairs, in such cases, has been a source of trouble to most users of steam. A leak in the supply pipe of a boiler or engine often causes the stoppage of a factory for hours. By use of this invention, the delays incident to such cases are avoided. This leak stopper can be put on in from two to three minutes, and it not only quickly but effectually closes the leak. If, when making general repairs, the old pipes are replaced by new ones, the stoppers can be saved to be used again, as they will last indefinitely. It is believed that a supply of these, kept on hand against times of need, will save many times their cost to any user of steam. For dye houses especially, where pipes corrode rapidly, they are invaluable. Hundreds of manufacturing corporations and manufacturers in New England have proved these facts during the last twelve months.

The device consists of an overlap, A, a piece of rubber packing, B, and clamps, C, to hold the overlap and packing firmly down upon the leak. The application is so obvious as to need no further description.

This invention was patented July 6, 1869, by Stephen Moore, of South Sudbury, Mass., who has assigned his right to himself and Homer Rogers, of the same place. The stoppers are manufactured and sold by James J. Walworth & Co., 1 Bath street, Boston, Mass., whom address for further information.

Fig. 1

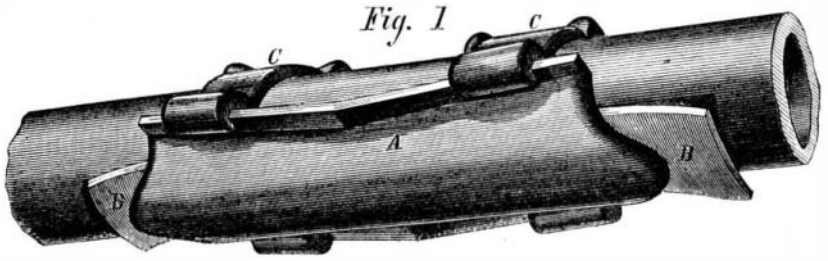
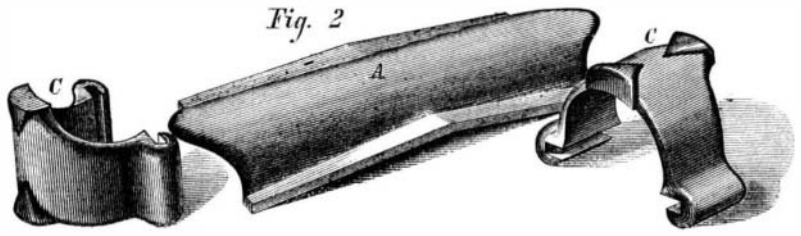


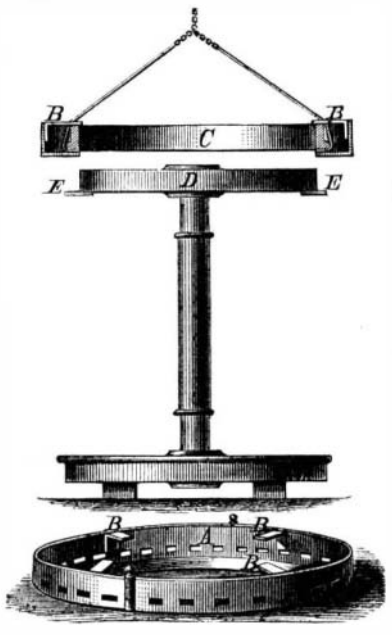
Fig. 2



MOORE'S PIPE LEAK STOPPER.

SMITH'S PORTABLE FURNACE FOR SHRINKING ON TIRES.

We regard this invention as one of those practical, common sense improvements, meriting notice, not only on account of its simplicity and adaptation to the purpose designed, but because it is calculated to cheapen and render more perfect an operation that requires much exercise of judgment and care on the part of the workmen performing it. It also spares the workmen exposure to the intense heat to which they are subjected in the old method of setting tires.



Mr. William S. Henerey, of Meeting Street Foundery, Charleston, writes, in a letter to the inventor, as follows:

"To give an idea of its capacity, I will state that I saw a five feet tire, two and a half inches thick, hung in one of your furnaces, with shavings and kindling and one bushel of charcoal spread around it, and in 20 minutes from the time of lighting the fire the tire was set in position on the wheel. It is due to you to state that in this trial the work would have been done in three to five minutes less but for the haste of the workmen trying it on in thirteen minutes when the tire was not sufficiently expanded, thereby giving out heat to the wheel and causing a loss of at least three minutes to overcome this extra expansion, but at the same time clearly showing its great superiority over the old process, where the tire is taken out of the furnace; for instead of a disagreeable and troublesome failure, it only required to wait on the increasing heat for a few minutes to see it drop nicely into its place. I look upon its adoption as certain by all who have this class of railroad work to do, as it certainly is a great labor saving machine."

Mr. H. T. Peake, Superintendent of the South Carolina Railroad, says: "I would earnestly advise its adoption by all railroad companies, engine builders, etc."

Mr. E. F. Raworth, General Superintendent of the Vicksburg and Meridian Railroad Company, says, "the method is unquestionably superior to any now in use."

These testimonials from practical men show that the invention is worthy the attention of railway officials and builders of engines throughout the country, and their interest thus attracted will be hightened by the simplicity of the apparatus as it is shown in the accompanying engraving.

It consists of a fire box, A, made in halves, of No. 10 sheet iron, open at the top, and held together by hinge joints, so as to be easily separated. Brackets, B, are secured to the sides of the box, to rest on the top of the tire and support the box. Holes are punched around the sides and bottom of the box for the admission of air to the fuel (charcoal), which occupies the space of four inches around the tire.

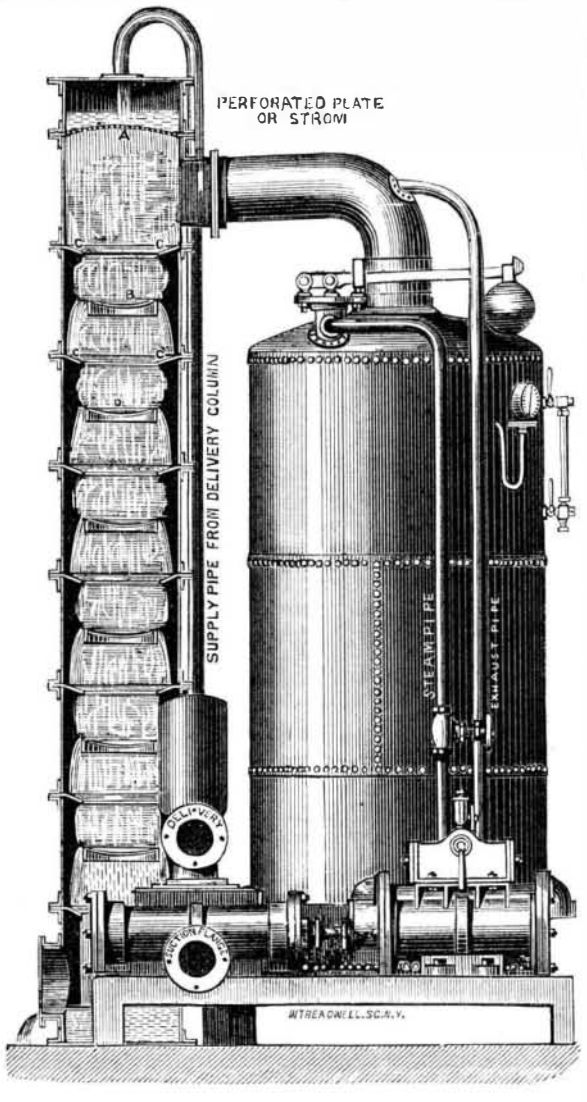
The tire, C, is suspended to a crane, the furnace then placed around it, and the charcoal put in and ignited. When the tire is sufficiently expanded (which may be readily determined by measuring with a rod), it is then placed on the wheel, D, resting on the gages, E; the furnace is then removed, the tire cooled off, and the unburned charcoal saved for the next operation. The furnace remaining around the tire until the operation is completed, obviates all danger of the tire sticking before reaching its destination.

It is claimed that one bushel of charcoal will shrink on any size tire, two and a half inches thick, with one sixteenth allowance for expansion, in less than thirty minutes from the lighting of the fire; and will remove an old tire in less than twenty minutes, not heating the wheel center sufficiently to injure the paint, and employing the labor of only four men.

For further particulars address the patentee, Mr. Wm. Bell Smith, M. S. C. R. R., Charleston, S. C.

TANGYE'S SMOKE AND HEAT PRECIPITATOR.

The annexed engraving shows an apparatus manufactured by Messrs. Tangye Brothers and Rake, St. Nicholas' buildings, Newcastle-on-Tyne, for precipitating soot and smoke arising from steam boilers, etc., in coal mining and underground and confined operations, and also for condensing sulphurous and other fumes from copper and chemical works.



The principle of the invention is at once seen on reference to the sketch, and consists in leading the chimney of the boiler into the top of the vessel termed the "precipitator," immediately beneath a jet of cold water, taken from the delivery pipe of a pump, which is distributed over the area of the vessel by means of the "strum," A. The water, in falling, has the effect of reducing to a minimum the heat passing from the boiler, and, at the same time, precipitating and absorbing the particles of soot and other products of combustion. In cases where a large supply for the jet is available, the cups and saucers, B C D, are unnecessary and not used, the copious shower falling from the strum to the bottom of the precipitator being quite sufficient.

IMPROVEMENT IN THE MANUFACTURE OF WHITE LEAD.

Mr. Decius Wadsworth, of Brooklyn, N. Y., has invented an improvement in the manufacture of white lead, for which he has recently obtained a patent through the Scientific American Patent Agency.

It is an improved arrangement of means for introducing and distributing the carbonic acid, used in the manufacture of white lead, in the basic solution of lead for precipitating, which consists in the application to the bottom of a tank containing a stirrer or agitator of one or more—preferably two—perforated pipes extending across the bottom in a groove or grooves, so that the stirrer or agitator will pass over them, the pipe or pipes extending through the side of the tank and being connected with a main pipe leading from the furnace in which the gas is generated, and having an air pump connected with it for forcing the gas into the solution in fine jets at intervals along the pipe, for exposing the whole mass uniformly to the action of the acid. The pipes are also arranged, at the projecting ends, to admit of the introduction of a brush or scraper from time to time, on the removal of a plug, for clearing them of the deposit of lead which enters the holes and obstructs the passage of the air and gas.

The tank is provided with a strong thick floor, in which are arranged two grooves, extending across it, one on each side of the center and parallel with each other. At one side of the tank are holes through it, coinciding with the grooves. These grooves are of suitable size to admit perforated tubes —say about three inches in diameter—so that they will not rise above the level of the floor. The tubes are arranged in the grooves, with one end projecting through the wall of the tank, and connecting with a supply pipe, which communicates with the furnace in which the gas is generated and has an air pump connection for forcing the gas into the tank through the small perforations. The agitator is kept in motion, while the acid is thus introduced, to thoroughly mix the acid with the solution. The pipes are connected with the main pipe in such a way that the outer ends, which are closed by plugs, may admit, when opened, a brush or scraper for removing the deposit of lead accumulating in them by settling in the holes. The pipes may be made of wood, copper, galvanized iron, or other suitable material.

By this improved means, the inventor claims to make the necessary uniform application of the acid to the lead with certainty and rapidity.

The process above described, namely, the distribution of carbonic acid over lead by means of a complicated arrangement of tanks, pipes, and other auxiliary parts, is old; but the improvement is intended to facilitate the operation and render it much more economical.

Curtis' Improvement in the Manufacture of Gunpowder.

Mr. Charles William Curtis, of London, England, has invented and patented, through the Scientific American Patent Agency, an improvement in gunpowder for use in heavy ordnance, known as "pellet" powder, which is usually made by compressing meal powder in molds, whereby it is formed into pellets of cylindrical form. Mr. Curtis' improvement consists in splitting such pellets longitudinally into halves, forming grains of semicylindrical form, the result attained in use being claimed to be a higher velocity of the projectile without increasing the strain on the gun.

He takes unglazed pellet powder, or powder compressed into short cylinders or pellets, the manufacture of which is completed with the exception of the glazing and stoving processes, and subjects each pellet to the action of a knife or other instrument, operated by hand or otherwise, whereby the pellet is fractured or split in a longitudinal direction. The split pellets are afterward glazed and stoved in the ordinary manner, which completes the process of manufacture.

The pellets, when whole, instead of being cylindrical, may be of other form, cubes or parallelopipedes, for instance, according to the shape of the molds in which the meal powder is compressed, and the shape of the pellets when split will be varied accordingly, instead of being semicylindrical. In any case, each split pellet has one roughened or fractured surface, as above mentioned. The compression of the powder into pellets may be effected by the aid of any suitable machinery, as the present invention does not consist in the machinery for molding the powder, or in any particular construction of knife or other sharp or pointed instrument or machine for splitting the pellets, as any suitable instrument or machine may be employed for that purpose.

The Boiler Experiments at Sandy Hook.

The experiments in the explosion of steam boilers under the authority of the United Railroad Companies of New Jersey, and the immediate direction of Mr. Francis B. Stevens, were commenced Nov. 22nd, on the U. S. Reservation at Sandy Hook. Nine boilers were set up and three were exploded under conditions which will form the subject of a future article. We prefer to defer a comprehensive review of the experiments until they have proceeded farther. The only important result yet reached seems to be the final corroboration of the fact, heretofore supported by much reliable testimony, that boilers may explode with terribly destructive violence, when amply supplied with water, and when the pressure is not in excess of that commonly used in high pressure engines.