AMERICAN INDUSTRIES.

[*Continued from first page.*]

and keys itself into it in the same way as mortar is put on and holds itself to the laths in finishing the interior of a house.

The application of this plastic non-conductor was first made directly to the surfaces of boilers, tubes, etc., and this method is still followed to a great extent where the tubes are small, or only limited surfaces are to be covered, and the expansion and contraction from differing temperatures will not be too great. The covering after it is put on has not a metallic hardness and firmness, so that its elasticity is sufficient for purposes of this kind, while it may also be colored, grained, varnished, and finished, so as to make an exposed steam pipe in a room accord in appearance with the character of the place, when this is desirable. It is also sufficiently oleaginous to prevent the oxidation of surfaces to which it is applied, and thus acts as a preserver of boiler and piping.

The "air space" covering, the patent for which became the property of the company in 1875, undoubtedly affords a better non-conducting covering than that made by the application of the plastic material directly to the surfaces to be protected. In this way a dead air chamber is made, so that the air surrounding the heated surfaces must be of an equal temperature with them, and any amount of expansion and contraction cannot affect the durability of the covering. For large surfaces it is usually put on in two coats, a rough and a finishing coat, as plasterers make a wall, when it may be painted or otherwise ornamented as desired.

The first non-conducting coverings used were made of wood, hair felt, paper, etc., but these, owing to their combustible nature, had to be constantly renewed. The felt coverings, also, being of a spongy nature, absorbed any moisture in their vicinity, thus not only destroying the fibers of the felt, but from their direct contact speedily corroding the metal surfaces they surrounded. Cements and compositions of fire-clay, asbestos, etc., were next used, but these, on large surfaces, not being able to withstand the expansion and contraction of the metals on which they were plastered, would crack and fall off. In many cases, also, the cements were so dense as to act as conductors of heat rather than the opposite. The "air space" method has none of these objections, the confined, dead air making the best non-conductor possible, while the frame holds the covering solidly under any possible amount of expansion and contraction. Under this plan of attaching the covering to a framework removed from the heated surfaces, hair felt, compositions, and cements, other than those containing asbestos, may also be used to advantage, as they cannot bring moisture to the metal to corrode it, and will not crack off from expansion and contraction, so that a much lighter covering will in this way be more effective than the heavy coats formerly used when applied directly on the surfaces.

The number of "test" trials to which the "air space" method of covering steam pipes, boilers, etc., has been subjected is very great, and they have extended over several years, in all cases amply proving everything that the company claim for it. This method was chosen as the best by the Commissioners and Chief Engineer of Machinery Hall at the Centennial Exhibition, and the company in this way covered all the pipes there and in the Annexes. In one of the tests made, where the "air space" method was brought into competition with their own surface covering and the coverings of other firms, under the most carefully guarded conditions, the "air space" method proved its superiority so decidedly as to distance all competitors. The trial was made by suspending a thermometer in an air-tight box, with a glass face through which its register could be observed, and running the steam pipes, protected by the various coverings to be tested, through this box; each test occupied an hour, the box being closed, for the commencement of the trial, when the temperature of 97° had been reached. In the cases where coverings of the pipes other than the "air space" was used, the temperature, with 10 pounds steam pressure, ran up to from 102° to 105° within 30 minutes, but with the "air space" covering the temperature could not be got up to over 90° in the open box, and with the box closed and the application of 14 pounds of steam reached only 94° after an hour's trial.

Many tests have been made as between steam surfaces covered and similar surfaces without any covering, but a noticeable one is mentioned in an account of some experiments by J. C. Hoadley on the economic effect of applying the Chalmers-Spence covering to a locomotive boiler, published in the *Journal of the Franklin Institute*, April, 1877, of which the following is a summary:

Steam Pressure.	Per cent Radiation, Boiler Uncovered.	Per cent Radiation, Boiler Covered.	Ratio of Saving by Covering.
130 to 140 lb. per square inch	13·7	5 8	42 2
120 " 130 " " " "	13·3	5·3	40·4
110 " 120 " " " "	12·9	5 7	44·3
100 " 110 " " " "	12·8	5·7	44·8
90 " 100 " " " "	11	4·9	44 8
80 " 90 " " " "	10·7	4·3	40·5
70 " 80 " " " "	10·2	4·3	42·2
60 " 70 " " " "	11·3	4·5	40
50 " 60 " " " "	10 6	4·6	43·8

The advantages of these coverings in the practical working of steam engines, and in manufacturing establishments where a great amount of coal is consumed, are shown in a marked diminution in the amount of fuel used, or a greatly increased steam pressure, or both.

This system not only saves the great loss of power which always attends the working of an engine when a portion of the steam has been condensed, which often occurs where an engine is run at a distance from the boiler, but it so helps to keep stored up the heat from the fires that a materially increased steam pressure is the invariable accompaniment of its adoption, so that, while it may not go far in aiding us to obtain in working power that theoretical value of coal for which all engineers are striving, its great economy in the way of saving the power which every one acknowledges is easily possible cannot be denied.

Besides owning the "air space" improvement, the company are manufacturers of various non-conducting compositions, hair felt, etc., and asbestos mill board, round packing, sheathing, wicking, and other articles of this class. They have factories at New York and Pittsburg, their New York office being at No. 40 John street, and they apply their improvements in every part of the country. The officers of the company are: John Roach, President; Geo. E. Weed, Treasurer; and R. H. Martin, Secretary and General Manager.

American Inventions Abroad.

A correspondent signing himself "Old Inventor," in the *Industrial Record*, published in London, calls attention to the alarming extent American inventions and machines are being introduced into England. Referring to the letter the editor quotes therefrom and comments as follows:

"In another column we publish a communication from an 'Old Inventor,' calling attention to the remarkably flourishing trade being carried on here in inventions, not of English origin, but of American production. 'Go where you will in London, American "notions," large and small, meet you at every turn—English inventions nowhere.' This is, no doubt, the case. We want no better evidence of the effect of the patent systems of the two countries. The smallness of the charges for a patent in the United States enables almost every inventor to protect his discovery, and to quickly find a market for it if it have any value, while the extortionate charges of the English tariff prevent all but a few from obtaining that protection which patent laws were designed to afford.

"But an 'Old Inventor' does not regard our scandalously bad patent laws as the only disadvantage which the British inventor suffers in comparison with his American rival. He finds in our moneyed and commercial classes a short-sighted disregard of the important services of inventors never characteristic of the same classes in America. 'Not only are her patent laws conceived and enforced for the encouragement and protection of inventors, but her capitalists and manufacturing classes are ever ready to assist inventors to develop and utilize their conceptions.' In the United States, 'let it be known,' he says, 'that an improvement has been discovered in machinery, a use found for a waste material, a new process devised in any industry, and the inventor has no difficulty in finding a market for his discovery.' Such, he adds, is not the case here. 'Let a man approach a manufacturer with a project for economizing labor, cheapening an article he is producing, or invite his attention to a new enterprise altogether, and he will be met with indifference, if not with suspicion, and dismissed as a "crazy inventor." Let him seek the assistance of a private capitalist, and he will fare no better. Rarely will he meet with sympathy or favor. Millions will be forthcoming in this country for any rotten foreign loan but to invest in a patent is a "risky speculation."'

"It must be acknowledged," says the editor, "that there is much truth in these remarks. If America has wanted money for any particularly rotten financial scheme, she has generally been able to get it here, but she has meanwhile been very careful to invest her own capital in the extension of her industries and the development of the inventive faculties and ingenuity of her citizens. We have by no means shown the same sagacity. But we think that the apathy and indifference to the claims of inventors which have distinguished us in the past, and must still, to some extent, be charged against us, are disappearing, and a more enlightened and enterprising spirit prevailing. But it has not been for lack of assistance and capital that the number of inventions lately taken up is not even larger than it is. The fault has been in too many cases with the inventors themselves. The value they put upon their own inventions is frequently very exaggerated, not to say absurd, and they defeat their own ends by the immoderation of their demands. When an inventor is content to rest his claim on the proved value of his invention, capital can generally be found to assist him, except where the invention is frivolous or manifestly worthless. If inventors would only bear this in mind, inventions of English production would be more frequently found in our markets and we should have less to fear from the formidable rivalry of America."

An Arctic Voyage Closed.

The unlucky Gulnare, of the Howgate Expedition, has returned to Newfoundland. The highest point reached was Disco Island, which the Gulnare reached August 9, badly battered by a storm. Two weeks were spent in repairing and taking in a half supply of coal. The return voyage was made mostly by sail, reaching St. John, September 24. Dr. Pavy, the naturalist, remained in Greenland to pursue his researches in natural history.

NEW INVENTIONS.

Mr. Benjamin Goodyear, of Carlisle, Pa., has patented a simple and inexpensive detachable bail or handle for crocks, that may instantly be applied or removed therefrom. The invention consists, essentially, of a stout wire bail in the shape of a figure 8, and having a curved clamp on each end, so that the said clamps shall be in a horizontal plane and with their concave faces opposite each other, so that when the clamps are applied to the opposite sides of a crock or other object, they will grasp the crock with a pressure dependent upon the upward pull exerted on the upper loop forming the handle of the device.

An improved faucet for dispensing mineral waters has been patented by Mr. John Collins, of Brooklyn, N. Y. The object of this invention is to furnish faucets for mineral water fountains, so constructed that the water can be introduced into the glasses without losing its sparkle.

Mr. Charles L. Bates, of New York City, has patented a gong bell, constructed so as to give a heavy blow with a short stroke. It can be adjusted for use as a right hand or a left hand bell, as may be required.

An improved wagon for gaseous liquid fountains has been patented by Mr. John Collins, of Brooklyn, N. Y. The object of this invention is to furnish wagons for gaseous liquid fountains, so constructed that the fountains will be securely held in place during transportation, and can be easily, quickly, and conveniently secured and released.

An improved berry basket holder has been patented by Mr. William J. Robinson, of Howlett Hill, N. Y. The object of this invention is to provide a simple device for holding a basket while picking berries, so that the berries shall not be spilled.

In the ordinary method of treating frozen paraffine oil for the separation of the oil from the wax, the frozen paraffine is inclosed in small cloths and folded and laid on plates in tiers of from twenty to twenty-five packages, and by the time the press is filled the frozen oil becomes warm, and consequently the crystallized wax melts and runs out as a liquid with the oil, and when the press is run down the wax in the cloths still contains oils, which renders it necessary for the wax itself to be again folded in cloths and again submitted to the action of the press, which process involves considerable labor, time, and waste of wax; and the wax is by this process rarely completely freed from the oil, while the oil always contains some wax, which injures the lubricating qualities of the oil. Mr. Herman Neahous, of Sharpsburg, Pa., has patented a process and apparatus that are free from the imperfections of the old method, and will make a thorough separation of the wax and oil, and do it economically.

Mr. Christian Heinzerling, of Biedenkopf, Germany, has patented a process of tawing hides for the purpose of adapting them to the uses of leather, which consists in first subjecting the raw hides to a solution of alum and zinc dust for the purpose of depositing amorphous alumina in the same, then to a solution of one of the chromic alkalies mixed with alum, or its described equivalent, and chloride of sodium, then fixing these in the hides by the chloride of barium, or its described equivalent, and finally greasing or fatting the hides.

How to Preserve a Carriage.

Mr. Starey, a prominent carriage manufacturer, of Nottingham, England, in a series of useful hints on their preservation, says that a carriage should be kept in an air tight coach house, with a moderate amount of light, otherwise the colors will be destroyed. There should be no communication between the stables and the coach house. The manure heap or pit should also be kept as far away as possible. Ammonia cracks varnish and fades the colors both of painting and lining. A carriage should never, under any circumstances, be put away dirty. In washing a carriage, keep out of the sun, and have the lever end of the "setts" covered with leather. Use plenty of water, which apply (where practicable) with a hose or syringe, taking care that the water is not driven into the body to the injury of the lining. When forced water is not attainable, use for the body a large soft sponge. This, when saturated, squeeze over the panels, and by the flow down of the water the dirt will soften and harmlessly run off, then finish with a soft chamois leather and oil silk handkerchief. The same remarks apply to the underworks and wheels, except that when the mud is well soaked, a soft mop, free from any hard substance in the head, may be used. Never use a "spoke brush," which, in conjunction with the grit from the road, acts like sandpaper on the varnish, scratching it, and of course effectually removing all gloss. Never allow water to dry itself on the carriage, as it invariably leaves stains. Be careful to grease the bearings of the fore-carriage so as to allow it to turn freely. Examine a carriage occasionally, and whenever a bolt or slip appears to be getting loose, tighten it up with a wrench, and always have little repairs done at once. Never draw out or back a carriage into a coach house with the horses attached, as more accidents occur from this than from any other cause. Headed, known here as top, carriages should never stand with the head down, and aprons of every kind should be frequently unfolded or they will soon spoil.

A carrier pigeon belonging to John C. Haines, of Tom's River, N. J., flew recently the distance of 36 miles in an air line in twenty-four minutes. Ten other pigeons released at the same moment reached home a minute later than their leader.