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GLAFCKE'S IMPROVEMENT IN PRISON CONSTRUCTION.

In prisons built according to the old system, chances of escape by digging or cutting through the prison walls, doors, floors, or ceilings are available to the prisoners, but, by constant improvements in such structures, escape has been rendered more and more difficult, and yet escapes frequently occur from the most modern prisons.

The latest improvement in prison construction, which forms the subject of our illustration, appears to furnish as nearly absolute security as it is possible to obtain, the result being secured in a very simple way, and by the use of low-priced material.

A prison constructed according to this system not only offers great resistance to any operation that will tend to destroy or injure it or render it less secure, but it also affords a ready means of indicating any tampering with the structure and also of giving an alarm in case of an attempt being made to break out of or into the prison.

The cells built according to this plan are made entirely of iron or steel pipes which intercommunicate, so that water or any other fluid may be kept under pressure in them. With this construction, should there be the slighest puncture or break, the small leak thus occasioned would at once give notice of the tampering with the pipes through the consequent reduction of pressure, which actuates an alarm; so that, before the operations necessary to an entrance into or escape from the locked cell could be fairly begun, the officers of the prison could be on hand to investigate the cause of the alarm. The walls, ceiling and floor of each cell are composed of pipes. The door, which is also composed of pipes, carries communicating therewith a lock, the parts of which are made tubular. The staple or keeper of the lock, through which the locking bar passes, is also made tubular. In front of each series of cells is arranged a cage, which is also of the same construction. The tubular system of each cell is connected by a pipe with pressure gauges, and an electric alarm operated by pressure gauges at the warden's office. In some cases a small longitudinal opening is left for the introduction of food.

The locks upon the doors are arranged to be operated by pressure, the bolts being pushed by a fluid acting upon a piston. Any retrograde movement of the piston, due to diminution of pressure, would be indicated at the warden's office upon the pressure gauge, and any considerable movement of this kind would result in giving an alarm upon the electric bell.

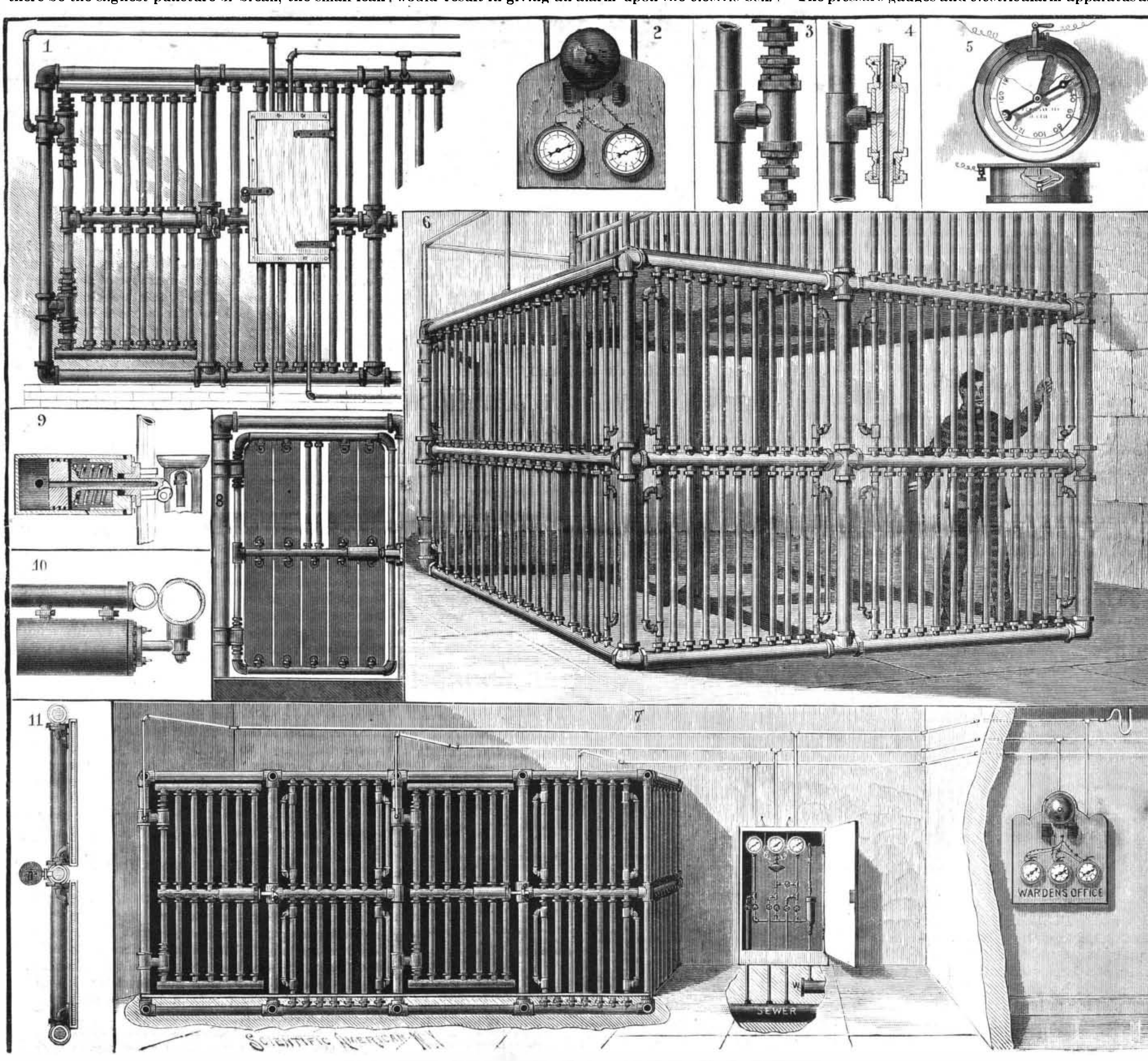
This system of protection, which is applied to prison cells and cages, has another application which is not less valuable than for prison walls, ceilings, and doors, that is, for safe deposit vaults, bank safes and vaults, etc., for the system of pipes is as effective in preventing entrance as escape, so that an unauthorized person could not gain entrance to a vault protected according to this system.

In Fig. 8, we show another system of construction, in which the cell is composed of a framework of piping, with hollow metal boxes connected to the piping and with each other, so as to form a solid continuous wall having a smooth, plane face.

The United States Treasury and Sub-Treasury might well adopt protection of this kind. The same principle carried out on a suitable scale can be applied advantageously to show cases containing valuables.

Fig. 1 of the engraving is a detail view, showing the construction of a large tubular cell door, with a portion of the cell structure, pressure cabinet, alarm gauges, etc., and Fig. 3 is an outside view of one of the tubular hinges, Fig. 4 being a sectional view of the same, showing the passages for supplying water to the tubular part of the door.

The pressure gauges and electric alarm apparatus are



GLAFCKE'S IMPROVEMENT IN PRISON CONSTRUCTION.

illustrated by Figs. 2 and 5, the latter showing the adjustable electrical contact arm carried by the spindle of the gauge behind the dial, and adapted to complete the electric circuit by engagement with a fixed contact piece. The details of the hydraulic lock are shown in Figs. 9 and 10. Figs. 8 and 11 show the hollow metal slab construction more particularly used in vaults, etc., while the remaining views show the complete jail structure ready for use.

It is obvious that this system may be applied to cells and vaults already built, or it may be placed around a cell block, whether it consists of modern steel cells or brick cells. In the application of this system to vaults and cells already in existence, the tubular walls may be erected around the whole structure, but the inventor prefers to place the tubular walls inside of the existing vault or depository.

This improvement in prisons is the invention of Mr. P. Emerson Glafcke, of Cheyenne, Wyoming. It is protected by patents both in this country and abroad, the patents being owned jointly by the inventor and Mr. T. A. Kent, a prominent banker of Cheyenne. This system has been approved by some of the foremost bankers, wardens and prison boards in the United States. Without doubt, the economy of construction and the effectiveness of the device will lead to its adoption where safety and protection are required.

Artificial Silk.

United States Consul Loomis, of St. Etienne, France, has recently sent to the State department a report giving information in regard to the Chardonnet process for converting wood pulp into what he calls silk. M. De Chardonnet has built a mill at Besançon, where the "silk" is now being manufactured.

The raw material is made from wood pulp, which is carefully dried in an oven and plunged in a mixture of sulphuric and nitric acids, then washed several times in water and dried by alcohol. The product thus prepared is dissolved in ether and pure alcohol, and the result is collodion, similar to that used in photography. This collodion, which is sticky and viscous, is inclosed in a solid receptacle, furnished with a filter in the lower end.

An air pump sends compressed air into the receptacle, and by its pressure the collodion is passed through the filter, which removes all impurities and flows into a tube placed horizontally. This tube is armed with 300 cocks, of which the spouts are made of glass and pierced by a small hole of the diameter of the thread of a cocoon as it is spun by the silk worm. The spinner opens the cock and the collodion issues in a thread of extreme delicacy (it takes six to make a thread of the necessary consistence for weaving). This thread is not, however, fit to be rolled on the spools, by reason of its viscosity and softness.

To produce the necessary hardness, the glass tube already mentioned is surrounded by a small reservoir, constantly filled with water. When the thread issues from the aperture in the manner described, it traverses this water, which takes up the ether and alcohol, and then the collodion becomes solidified; that is to say, it is transformed into an elastic thread as resisting and as brilliant as ordinary silk. The stuff manufactured was found to be dangerously inflammable. M. De Chardonnet has apparently removed this difficulty "by plunging the spun thread into a solution of ammonia, thus rendering it as slow of combustion as any other material."

The consul adds: "This discovery seems to have a great future. I have talked with great men, silk merchants, brokers, dyers, and men who manufactured silk goods, about the Chardonnet method of producing raw silk from wood, and it is universally admitted that the process will eventually yield large practicable and profitable results."

It is proper for us to add that this so-called artificial silk is a very different substance chemically from that produced by silk worms, and there is not likely to be any substitution of the one for the other in trade.

THE directors of the Grusonwerk of Magdeburg-Buckau, Germany, have issued a circular in which they state that the firm of Friedrich Krupp, of Essen, has obtained the right of working the enormous plant of the Grusonwerk. In return for this the Krupp firm guarantees a fixed annual dividend to the shareholders of the Grusonwerk. This combination is of great importance, as the two firms virtually control the armor plate manufacture of Europe. The Gruson factory manufactures not only guns of all sizes, from small quick fire guns up to large size cannon, but they also make all kinds of armor, armored turrets, gun carriages, ammunition, etc. The Grusonwerk has been equally successful in the peaceful arts, and it manufactures a large variety of metallurgical and mining machinery, hydraulic machinery, gas engines, distilling plants, railway material, etc. The enormous factory at Magdeburg-Buckau contains 75 steam engines, 1,100 machine tools, 10 steam hammers, including one of 100 tons, 18 cupolas and 29 open hearth furnaces.

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AGRICULTURAL RAILWAYS.

A large body of farmers have united in Kansas for the purpose of building an electric railway across the prairies to enable them to ship their cattle and other products to market, and thus put a million of dollars or more which they now claim to spend annually in transportation into a road which they themselves shall own. The scheme is a pretentious one, more pretentious than the present knowledge of electrical matters and the courage of the financial world would warrant, because the road as proposed is five hundred miles or more in length. Nevertheless a committee has been in Chicago investigating the matter with a view to adopting the storage battery or the trolley system, whichever one seems best adapted to the purpose.

Even if these farmers are somewhat ahead of the times in their purposes, they are foretelling what is soon to take place. At the present rate of electric railway building most of the larger towns and cities which have passenger traffic in sufficient volume to support an electric railway system will be well supplied in this particular in three or four years at the outside. When this field is well covered it is hardly probable that manufacturers of electric railway apparatus will give up the manufacture of a line of material of such unquestioned economic value as theirs, and they will extend their business in other directions, and the transportation of freight would naturally be the desired, in fact is the only, direction which gives promise of satisfactory financial returns. Several electric railways in various parts of the country already do a considerable business in the line of carrying freight, but the possibilities in this direction are by no means fully demonstrated yet. A great necessity in any inhabited section of country is good roads over which the products of the earth can be economically transported to market. In this respect our country is sadly lacking, and the farmers of Kansas and other Western States know how to appreciate this when oftentimes they use the corn they have raised for fuel because excessive freight charges make it impossible for them to ship it East and receive remunerative returns.

The scheme of the Kansas farmers to build an electric road is not so harebrained as it might be by any means. Such electric roads will not take the place of trunk lines of steam roads any more than electric light has taken the place of gas. One supplements the other. A few such electric roads for purposes of transporting freight, if built with regard to commercial needs, would prove valuable feeders to the steam roads and increase their amount of freightage.

When Edison Was Young.

"I was an operator in the Memphis office when Thomas A. Edison applied to the manager for a position," said A. G. Rockfeller, a member of the Reminiscence Club, St. Louis. "He came walking into the office one morning looking like a veritable hayseed. He wore a hickory shirt, a pair of butternut pants tucked into the tops of boots a size too large and guiltless of blacking. 'Where's the boss?' was his query as he glanced round the office. No one replied at once and he repeated the question. The manager asked him what he could do for him, and the future-great proceeded to strike him for a job. Business was rushing and the office was two men short; so almost any kind of a lightning slinger was welcome. He was assigned to a desk and a fusillade of winks went the rounds of the office, for the 'jay' was put on the St. Louis wire, the hardest in the office.

"At this end of the line was an operator who was chain lightning and knew it. Edison had hardly got seated before St. Louis called. The new comer responded and St. Louis started in on a long report, and he pumped it in like a house afire. Edison threw his leg over the arm of his chair, leisurely transferred a wad of spruce gum from his pocket to his mouth, picked up a pen, examined it critically, and started in, about 200 words behind. He didn't stay there long, though. St. Louis let out another link of speed, and still another, and the instrument on Edison's table hummed like an old-style Singer sewing machine.

"Every man in the office left his desk and gathered round the 'jay' to see what he was doing with that electric cyclone. Well, sir, he was right on the word, and was putting it down in the prettiest copper-plate hand you ever saw, even crossing his t's, dotting his i's and punctuating with as much care as a man editing telegraph for 'rat' printers. St. Louis got tired by and by and began to slow down. Edison opened the key and said, 'Here, here! this is no primer class! Get a hustle on you!' Well, sir, that broke St. Louis all up. He had been 'raw hiding' Memphis for a long time, and we were terribly sore, and to have a man in our office that could walk all over him made us feel like a man whose horse had won the Derby. I saw the 'wizard' not long ago. He doesn't wear a hickory shirt nor put his pants in his boots, but he is very far from being a dude yet."—*Practical Electricity.*

THE Minot Ledge lighthouse is of granite; height, 88 feet, the lower 40 feet being solid.