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EXPANSION OF METALS

Effects of Temperature on Rails and Bridges.

An ordinary poker, such as is used in our homes for stirring up the fire on a winter's night, if allowed to come to the temperature of boiling water is only about one two-hundred and fifty-eighth of an inch longer than when at its freezing point. This does not mean much to the everyday man, but the expansion of metals due to heat is a very important subject for the bridge engineer or the maintenance of water superintendent.

An accident occurred not long ago in England due to the expansion of rails. The variation of temperature between a winter and summer in many parts of the world is not more than 80 degrees F. Yet this range of temperature is competent to produce a variation in the length of the rails of about two feet in the mile. The effect of this expansion if it is not allowed for in the track is usually to cause the outer rail on a curve to bulge out more than the inner one and thus throw the track out of gauge. The force exerted by an expanding rail is estimated at about 1,000 pounds for each degree of temperature. —Railway and Locomotive Engineering.

Novel Railroad Record.

The Grand Trunk Pacific railway (Canada) has commenced a novel undertaking whereby a record of the growth of the west so far as the railway is a factor in its growth will be kept, says the Scientific American. The official photographers of the company have begun to work on the plan of the company, and towns along the line will be photographed, each photograph being duplicated yearly, so that a continuous record may be obtained and kept of each individual town from the time it sprang up throughout the period of its growth. The record kept is expected to be of invaluable importance in years to come.

GREAT ARTIFICIAL HARBOR.

Naval Port at Dover is Largest Area of Open Sea Ever Inclosed.

The opening of Dover naval port marks the completion of the greatest artificial harbor ever built entirely in the open sea. The scheme includes an extension of the admiralty pier for 2,000 feet, the formation of reclamation works for the protection of the shore at the eastern end of Dover town extending in the direction of St. Margaret's bay for 3,900 feet, a protecting arm extending from the eastern end of the reclamation for a distance of 2,900 feet into the open sea and an island breakwater approximately parallel with the shore line and extending from the end of the admiralty pier extension on the west to the end of the easterly pier already referred to, with wide entrance openings between the heads of the several breakwaters. If we include the eighty acres which constitute the present commercial harbor there is inclosed by these works a total area of low water of 600 acres of deep water harbor capable of floating the largest of modern battleships and ocean liners. This is the largest area of the open sea ever inclosed by solid masonry protecting works.

Although that portion of the inclosing breakwaters which is visible in high water gives an impression of their great length and of the wide extent of the harbor, it is a fact that the visible masonry represents only a small proportion of the work actually done. The total length of the set works is two and a half miles, two miles of which are in exceptionally deep water. Thus the 2,000 foot extension of the admiralty pier measured from the top of the parapet to the foundation nearly 100 feet in height and the eastern pier has a total height above foundations of eighty-seven feet. The total width at the base of the piers is over fifty feet and at the top thirty-seven feet six inches.

The fears which have been expressed that this, like other harbors won from the open sea, might be subjected to shapling up by drifting sands have not been verified, the depth remaining practically constant. —Scientific American.

DEFIED THE KAISER.

A Pilot Who Knew His Business and Had Lots of Nerve.

In a fit of impatience because the speed of his yacht was slowed down on entering a certain harbor, the German emperor on one occasion tried to assert his authority and rang the bell for "Full speed ahead." To his great surprise, the pilot, an old Norwegian named Nordhuns, who knew the dangerous character of the channel, placed himself in the way and, leaning over the wheel, called down the tube to the engine room, "Half speed ahead—never mind the bell!"

"What! You dare to countermand my orders?" cried the impetuous monarch, again ringing the bell.

"Disregard the bell," calmly repeated Nordhuns through the tube.

For a moment the kaiser glared at the intrepid pilot, and then, drawing himself up to his full height, said majestically, "Go below, sir, and report yourself under arrest."

"Leave the bridge!" thundered the Norwegian grimly, as he grasped the wheel more firmly. "This ship is in my charge, and I'll have no interference with my orders from emperor or seaman!"

The officers on deck hurried silently aft, wishing luck to the sturdy old sea dog, who, knowing that he had the law as well as common sense on his side, stood at his post unshaken by threats, unheeding commands, and steered the Hohenzollern safely into port.

The next day the emperor came to his senses and decorated the pilot with the Order of the Black Eagle and also appointed him his life pilot in Norwegian waters. —Pearson's Weekly.

Evolution of a Play.

"They tell me that plays are built up. Is that so?"

"It is," answered the playwright. "Here is the method. I cop a joke. I tell it around, and it goes. Next I make a dialogue of it. Then I add a character, and it becomes a vaudeville sketch. If it still goes good we make three acts of it, and then it's a play." —Kansas City Journal.

What He Wanted.

Little Girl—Mr. Lingerlong, is a quietus something you wear? The Young Man—No, Miss Kitty. Why do you ask that? Little Girl—'Cause I hear mister tell mamma the other day she was going to put a quietus on you the next time you came. —Chicago Tribune.

The Privilege of Peers.

There is a curious case in Fortescue's "reports" relating to the privilege of peers, in which the bailiff who many years ago arrested a lord was forced by the court to kneel down and ask his pardon, though he alleged that he had acted by mistake, for that his lordship had a dirty shirt, a wornout suit of clothes and only sixpence in his pocket, so that he could not believe that he was a peer and arrested him through inadvertence. —Green Bag.

He Changed.

"Greyman's wife brought him home a suit of clothes, but I understand he mustered up the courage to tell her that she had made up his mind to change it."

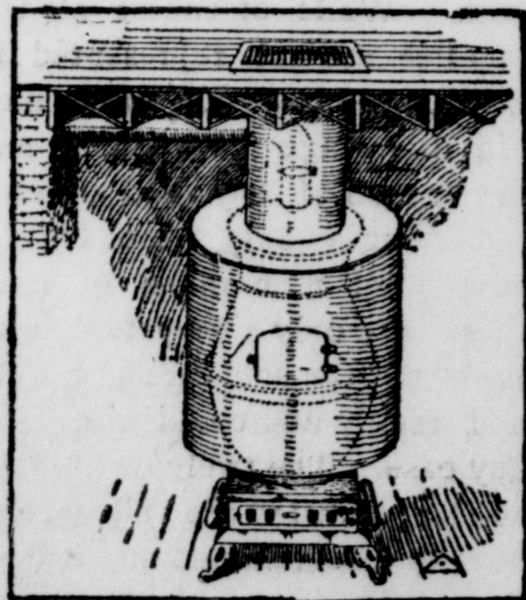
"Did he change it?"

"Oh, yes; he changed his mind." —

HOMEMADE FURNACE.

Constructed From an Old Stove and a Galvanized Tank.

This furnace was constructed from an ordinary pot stove and an old gallon galvanized oil tank turned upside down over the stove, says Popular Mechanics. Holes were cut in the bottom of the tank for the stove and the hot air pipe. The tank was supported about one foot from the floor



OLD STOVE IN TANK.

so as to let the cold air in from the cellar to take the place of the hot air as it passed through the air pipe into the room above. A hole was cut in the side of the tank opposite the stove door and another door attached to provide an opening for feeding fuel into the stove.

The stove was made to heat a store and was used with entire satisfaction. Very little coal was used during the winter, and plenty of heat was produced at all times.

NAILING MACHINE.

Automatically Places Nails in Position For the Hammer.

This machine, which is specially designed for nailing shingles, relieves a workman from practically all trouble except that of hitting the nail on the head and of moving the machine into the next position. The nails are dumped into the hopper, in the bottom of which are three parallel slits. The vibration of the machine in use causes the nails to drop point downward into the slits and hang by their heads. Thence they pass into a similar slit in



IMPROVED NAILING MACHINE.

the incline and slide, still hanging by their heads, down to the catch spring. This spring holds the nail under the plunger, which sets the nail in the material.

The machine can be used with the hands protected by gloves or mittens, and it obviates the necessity of holding nails in the mouth and prevents bruised fingers. —Popular Mechanics.

A Dairyman's Yarn

A bunch of dairymen were together a few days ago spinning yarns about the cow when one of them sprung this: "We had a cow once and one of the boys by mistake left a pail of gasolene stand where she could get at it. She tasted the juice and liked it, so lapped it all up. Some time later we heard an awful commotion in the cowyard. I ran down and saw the cow galloping around, yelling 'Honk, honk, honk, honk!' When I saw the empty bucket I knew that the cow was suffering 'auto-intoxication.' We couldn't get the animal into the barn, so I painted a sign 'garage' and hung it out. In she steered. We had to cut a hole in her hoof to keep her quiet until the effects of the gas wore off. You see, she thought she had blown up a tire when the hoof was punctured."

Poultry Pointers

It is too late to be setting eggs. For this reason it is well to take the male birds out into a pen by themselves.

Throw open the windows every night, but tack some wide-meshed cloth or screen of some kind over them to keep out things that have no business in the house.

Sort the young growing stock as to size, it will give them all an equal chance and you will find they will grow better and less trouble will be experienced.

When there are two pens of fowls in the same house, separated by a partition, the drink dish may be set in the partition so that fowls may drink from both sides. It should rest on a shelf so that it may be easily removed for cleaning and disinfecting.

Fall Plowing Advocate.

It is almost always advisable to plow clay lands in the autumn. If clay land can be plowed shallow soon after the hay is removed in the case of sod, and after the crop is taken off in the case of stubble, it is much better. It not only ensures a good reservoir for holding moisture, but also stores up more available fertility than where the soil is plowed but once.

UTILIZING WASTE COAL.

Worthless Slack Burned With Ease in Patent Furnace.

An illustration of the feasibility of using waste coal for power purposes has just been given here, one of the new patent water tube boilers having been installed in an oil mill in this city, reports Consul Hamm of Hull, England. The success of a public exhibition given shows, it is claimed, that much coal which has heretofore been rejected as worthless can be used and that greater efficiency can be obtained from this waste coal by the new method than from the best coal by the old method.

The system employs the known principle that almost perfect combustion can be obtained by mixing air in proper quantities with pulverized coal before the latter is introduced into a furnace. This insures better combustion with less air than usual and with a consequent increase of boiler efficiency by reducing the amount of heat carried away by the escaping gases. The results obtained with the poorest kind of fuel are claimed to be as follows:

The amount of elimination of losses, as well as the fuel is burned in suspension, the amount of unconsumed coal in the furnace at any given time being infinitesimal.

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