

#### Education at the World's Fair.

Commissioner Harris is desirous that a single building be furnished at the Columbian Exposition, Chicago, of sufficient extent to contain and properly display all of the exhibits that belong to education. He says that at Philadelphia in 1876 not only the foreign exhibits were separated and scattered, but the exhibits of the several States were isolated from one another. The effect of the educational exhibit at Philadelphia consequently was very much weakened. But at the cotton centennial at New Orleans, the educational exhibits of the United States and of foreign nations, with a few exceptions, were brought together in the gallery of the government building. Those who inspected it pronounce it the best exhibit hitherto made of education. Undoubtedly it derived half its advantage from the fact that it was disposed and arranged under one supervision, and the whole of its material brought together in one place. Dr. Harris suggests there be organized in each State, as soon as possible, a committee with authority to take in charge all matters pertaining to educational exhibits. Such a committee may be provided for by the legislature, or appointed by the governor, or, in the event that neither of these arrangements is practicable, said committee may be organized by election from local committees formed in cities and towns, and in the educational institutions of the State. In whatever manner appointed, the committee should be thoroughly representative of all classes of schools and educational institutions, whether public, private, or denominational, and it should include State, county, and city superintendents, the officers of private schools and academies, presidents of colleges and universities, directors of institutions for the defective classes, etc. This proposition is most sensible, and should meet with a hearty response from all who wish to see our educational interests properly presented at this great exposition. Representatives from all the world will visit this great exhibit, and it is highly important that they should see what we are doing toward educating our children and youth.—*New York School Journal.*

#### HOW STOCKS OF PIG IRON ARE HELD.

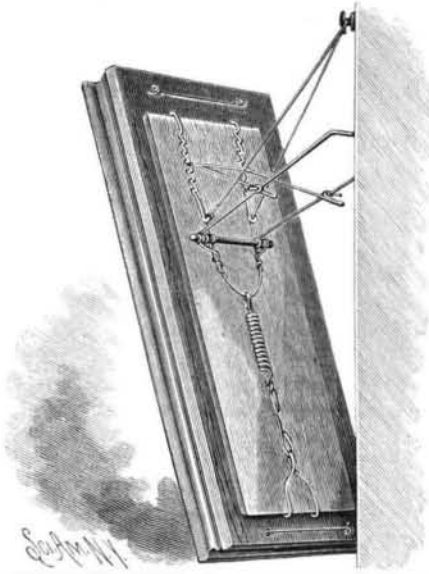
Within the past two or three years there has grown up in this country a system, which had previously been successfully adopted in Scotland and England, by which the products of pig iron furnaces may be conveniently stored, when the demand for consumption is light, and the owners can obtain money thereon, proportionate to the value of the accumulating product, with which to keep their furnaces in operation during a dull season. This system as carried out by the American Pig Iron Storage Warrant Company includes the establishment of what is known as a "warrant" yard in close proximity to each large furnace, and convenient to the necessary transportation facilities. These yards are owned or leased by the company, and in charge of its special agent. When the production of the furnace is in excess of its sales, or the owners desire to hold the product for an anticipated better market in the future, such a yard not only affords a convenient storage place, but the iron, as received there, is inspected by an expert agent, and a warrant is issued for each lot, certifying its quantity and grade. These certificates, representing each so much iron of a defined quality, are readily negotiable in all the principal markets, after the same manner as the pipe line certificates representing petroleum, or any species of stocks or bonds. The owner, on pledge of such security, can borrow money at the most advantageous rates, and the certificates themselves are salable by transfer as so much iron.

In the accompanying illustration we present a view, made from a photograph, of such a storage yard at Bessemer, Ala., containing over 12,000 tons of pig iron. The yard is about 120 feet wide and 600 feet long, and each 100 tons is piled in a solid block, forming a pile about twelve feet long, ten feet wide, and eight feet high, each block being well defined and plainly marked. The company has about twenty of these yards established at different furnaces in Virginia, West Vir-

ginia, Kentucky, Tennessee, Georgia, and Alabama, and other places. There was on storage at all of these yards, on April 1, about 55,000 tons, but the quantity was being reduced, as more iron was being taken out for consumption than was coming in from the furnaces.

#### A HANGER FOR PICTURE OR MIRROR FRAMES.

The illustration represents the application of a convenient and inexpensive device that may be quickly attached to mirror or picture frames of different sizes, to hang them at any desired inclination. It has been



RULON'S PICTURE FRAME HANGER.

patented by Mr. David G. Rulon, of No. 826 South Main Street, Monmouth, Ill. The wire suspending portion of the device extending across the back of the frame is coiled around a horizontal stay rod, and has a series of short return bends on the two limbs above the stay rod, forming ratchet racks, while a spiral spring forms a section of its length below the stay rod. Upon the end portions of the stay bar are wrapped the ends of a wire prop piece having ring eyes in its side members, such eyes being loosely engaged by the ends of a wire brace adapted to engage the teeth of the ratchet racks, thus holding the prop piece inclined outwardly from the frame as desired to give the proper inclination to the picture or mirror to which the device is applied. The frame is suspended by means of a strand of wire connected to eyes on the side limbs of the hanger, and when there are no ledges on the back of the frame with which to connect the device, short holder wire strips are secured in proper position near the top and bottom of the frame, with which the hooks at the ends of the hanger are brought into engagement.

It is sometimes convenient for an engineer to be able to approximate the amount of condensation that will

#### What May be Patented.

The Washington *Chronicle* gives the gist of our patent laws in the fewest possible words as follows:

A United States patent will be granted to any person who has invented or discovered any new and useful art, machine, manufacture, or improvement thereof, not known or used by others in this country, and not patented or described in any printed publication in this or any other country, before his discovery or invention thereof, and not in public use nor on sale for more than two years prior to his application, unless the same is proved to have been abandoned.

In this connection the word "art" means the process or method of producing an old or new result. If a method of doing anything contains one or more new steps, the process is new and patentable.

The word "machine" means any device or thing by means of which a mechanical result may be produced, such as a pin, a churn, or a locomotive.

The word "manufacture" means a made-up article, such as furniture, clothing, harness, and the thousands of things which are offered for sale.

"Composition of matter" means a chemical compound of ingredients, such as hard rubber, liquid glue, medicine, etc.

Patents may also be obtained for designs for manufactures and works of art, for three, seven, and ten years.

Trade marks may be registered for any arbitrary sign or symbol which is not descriptive; the government fee is \$25. Such marks are the exclusive property of the registrar for thirty years, and the time may be extended.

A "label" is any descriptive tag, print, or impression to be placed upon any article or its case, and it may be registered for twenty-eight years. The government fee for a "label" is \$6; but if it contains any special mark or symbol, the office decides it to be a "trade mark" instead of a label.

#### Heavy Locomotives for the St. Clair Tunnel.

The approaches of the St. Clair Tunnel, connecting the Grand Trunk Railway of Canada with its line in Michigan, will have a grade of 105 feet to the mile, and a very heavy locomotive will, consequently, be required to haul heavy trains up the grade. For this purpose four extra large locomotives are being built by the Baldwin Locomotive Works, the heaviest ever built there, and, it is believed, the largest ever built in America. One of them, "No. 598," is already completed, is now at Port Huron, and in working order weighs 195,000 pounds. These locomotives are of the class known as tank locomotives, and have no tender. The tanks are on both sides of the boiler, and their capacity is 2,000 gallons. The space for the fuel, which is anthracite coal, is on the foot-board. There are five pairs of driving wheels, which are the only wheels, and they are 50 inches in diameter. The wheel

base is 18 feet 3 inches. The cylinders are 22 inches in diameter and have a stroke of 28 inches. The boiler is of steel,  $\frac{5}{8}$  of an inch thick, and is 6 feet 2 inches in diameter. There are 280 flues,  $2\frac{1}{4}$  inches in diameter and 18 feet 6 inches long. The firebox is 11 feet long and  $3\frac{1}{2}$  feet wide. The cab is placed on top of the boiler and midway between the ends. There are two sand boxes, one on the front of the boiler and one on the back, so that sand can be placed on the rails whether the locomotive is running forward or backward. There is a powerful air brake which operates on each driving wheel. There are headlights and steps at both ends, like those of a



A PIG IRON STORAGE YARD, BESSEMER, ALA.

take place in pipes during a certain length of time. From many experiments made on the condensation of steam in wrought iron pipes when exposed to the open air, it is found that 1 pound and 6 ounces of steam per square foot of pipe's surface was condensed per hour when the difference in temperature between the steam and air amounted to 200°. As this is very nearly the difference of temperature usually found between the steam in the pipes and the air on the outside, this simple rule will give results sufficiently close for ordinary purposes.

shifting engine. The locomotive will run on 100 pound rails. In its completed state the locomotive is too heavy for some of the bridges it will have to cross *en route* from the Philadelphia shops to the tunnel, so the cab, the tanks, side rods, and other parts will have to be taken off to lighten her weight and be shipped separately.

ONE of the features of the grand parade in Des Moines during the Iowa state fair was an electrically propelled buggy, the current being furnished by storage batteries.