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SCIENTIFIC AMERICAN SUPPLEMENT

No. 616,

For the Week Ending October 22, 1887.

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NEW KNOWLEDGE ABOUT CAR COUPLERS.

The idea that it was necessary to have a certain amount of loose play between the cars composing a long train, in order to start the train easily, had become by practice and theory almost as fixed in the minds of railway people as is the geometrical axiom that two parallel lines can never meet. The theory was, by starting one car first, and so gaining a little inertia, then the next car, and so on, it was made possible for an engine to start and haul a long train of a given weight, when, if there were no play, the engine would be stalled and unable to start the train.

But the fallacy of the practice and the theory was conclusively established during the remarkable series of car coupler experments made by the Master Car Builders' Association, at Burlington, Iowa, this year. During these trials it was demonstrated beyond all question that it required less power to start a train with all the couplings tight than to pull the train after the train was put in motion; and the Coupler Committee came to the conclusion that the coupler of the future ought to be an approved form of the close hook style.

THE AMERICAN INSTITUTE EXHIBITION.

The 56th exhibition of the American Institute is now in progress at the Institute building on Third Avenue, in this city. As yet all the exhibits are not in place and in running order, but a few days will have everything in full operation. So much of interest is to be seen and studied there that a single visit is far from enough to do the Institute justice. The recent development of the economic applications of electricity have had their effect in founding what is a comparitively new division of the exhibition. Some of the most interesting exhibits are in this class.

The Draper Mfg. Co. exhibits a series of registering meteorological instruments. They include a thermometer, barometer, anemometer, pluviometer, sun thermometer, and wind gauge. The last named registers the force of the wind in pounds per square foot. One peculiarity of these instruments is the use of flat registering tablets instead of cylinders. Thus the record of the entire period of registration is visible at a glance. A glass tube drawn out to a fine orifice and charged with red ink is used instead of a pencil to mark the line upon the registers, thus avoiding friction.

The Bentz thermo-electric regulator is a practical application of somewhat the same character. The draught of a furnace is regulated thermometrically so as to maintain the temperature of a room always at the same degree. In kerosene fire logs and cartridges one of the recent tendencies of invention, also in the line of domestic heating, is well illustrated. The idea is a good one, and it is hoped will put an end to the deaths resulting from attempts to light a fire by kerosene poured on indiscriminately.

Asbestos packing, cloth, and plastic stove lining composition are represented by very interesting exhibits of the H. W. Johns Manufacturing Company. Some of the samples of the manufactured product are very beautiful. One rope-laid piece, an inch in diameter and many yards in length, looks almost like silk.

Before this exhibit is reached, an operation of much interest may be seen in diamond cutting. A couple of operators are kept busy carrying on this work. The stones bedded in composition are held in supports bearing against the upper face of a horizontal rotating disk. They are fed from time to time with diamond powder, and are slowly worn away to the proper facets. By importing diamonds in the rough and cutting them here, a saving in cost is claimed. At any rate, it marks the introduction of a new industry, as but a few years have elapsed since the first stone was cut in America.

Leather link belting is well exhibited in a series of belts of different widths, that are kept in motion over two cylinders. One of the main driving belts used in actuating the countershafting and machinery is of this type also. A special interest attaches to leather link belting, as it is one of the few methods of reducing the velocity of an electric motor for driving street cars that has ever succeeded. This point was brought out in a recent paper by Mr. Anthony Reckenzaun, which was read before the American Institute of Electrical Engineers.

The Washburn & Moen Manufacturing Company have a large case containing samples of copper wire, watch and other springs, a copper ingot with polished face, and wire cables. A series of specimens of the latter show the rigging used on the Mayflower and Volunteer, each rope being designated by the use made of it, whether for head stay, bob stay, or other rigging.

One interesting series of exhibits shows the work of the Shriver Iron Foundry. Relief and intaglio castings of great delicacy are comprised in it. As a sample, one casting is made from a piece of rough ash plank as a model. All the grain of the plank is perfectly reproduced in the cast iron.

In the rear extension is one of the cyclone pulverizers, which of late have attracted some attention by their extraordinary power of demolishing and reducing to powder nails and similar objects. When set to work, it will doubtless attract much attention. In the same part of the building a series of rock crushers are kept working, producing broken stone for road making, concrete, and other uses. Here also are some of the St. Lawrence River fishing boats, fitted with centerboard and sail, as well as for oars. They have nickel plated fittings, cane seated chairs, and are very elegantly finished.

The electric exhibition includes far more of interest than our space will enable us to describe. The Sprague motor and the Daft motor are shown driving various classes of machinery, such as printing presses, fan blowers, elevators, etc. A sectional piece of the Daft electric way with central underground wire, and an electric railway running the length of the building and driven by the Daft motor Ampere, are of special interest. A Sturtevant fan is shown directly driven by a Sprague motor; the armature is carried by an extension of the axle of the fan.

Two of Prof. Forbes' electric meters are shown, one inclosed in a glass shade, the other in a cylindrical metal case with plate glass top. The meter was recently illustrated by us.*

Queen & Co. have a very full series of electrical apparatus: Solenoid am and volt meters; Wheatstone bridges on the meter bridge principle, but of contracted length; Ayrton & Perry and Deprez & Carpentier volt and am meters; pocket galvanometers and general electrical instruments of precision of endless variety are included, and would repay a long inspection.

The Thompson process of electric welding is to be performed practically in a few days. At present a remarkable series of samples of the work is shown. It includes bars of cast and wrought iron, steel, zinc, lead, brass, and copper all thus united. Many broken pieces are shown, the break never occurring at the weld. Twist drills welded in the twist, a drawing knife the weld in which cannot be seen, lead and iron pipe and other difficult objects electrically welded are among them. This process should be seen by all, as it is one of the most interesting electrical developments of the day. It is of theoretical interest as establishing the existenee of a zone of welding or of plasticity for all metals so far tried. For flux, borax is used with the hard metals, and soldering acid with soft lead and zinc.

In the Edison exhibit as yet little is to be seen. The dynamo is elegantly finished, and is well worthy a careful inspection. The "straight line" engine by which the dynamo is driven is of interest. Cylinder, front cylinder head, and main frame are all in one casting. No packing is used. The joints of the back cylinder head and steam chest are faced, and are made iron to iron. The piston rod runs through a long sleeve of Babbit metal. This is drilled to fit it tightly when cold. The heat of the steam makes it a perfect fit.

A great number of prints executed by the photogramme process are shown. Among them is a series taken from orthochromatic negatives of oil paintings. These mark an important technical application of this elegant discovery, and should be examined by all photographers.

What the Type Writer is Doing.

The type writer is creating a revolution in methods of correspondence, and filling the country with active, competent young ladies who are establishing a distinct profession, and bringing into our business offices, lawyers' offices, editorial sanctums, etc., an element of decency, purity, and method which is working a perceptible change. The field is widening daily; not from crowding out of their places young men who have been in the habit of claiming a pre-emption for clerical work of all descriptions, but in creating absolutely new positions. The revolution, if it may be called so, has come from the discovery to business men of an ability of which they were unaware until the great convenience and excellent work of the type writer forced them to it. The art of dictation is almost a new art, but it is spreading rapidly, and business men are beginning to understand that much of their lives has been wasted in the mere mechanical drudgery of letter writing, and that through employing a competent amanuensis they are now enabled to get off their correspondence with the least possible friction and the smallest amount of time. Whereas, five years ago, the type writer was simply a mechanical curiosity, today its monotonous click can be heard in almost every well-regulated business establishment in the country. A great revolution is taking place, and the type writer is at the bottom of it.—*Penman's Art Journal.*

To Cure a Kicker.

The *Calistogian* gives this prescription its warmest indorsement: If you have a horse that is in the habit of kicking, put him in a narrow stall that has both sides thickly padded. Suspend a sack filled with hay or straw so that it will strike his heels, and let the horse and sack fight it out. Be sure to have things arranged so that the horse cannot hurt himself. The sack will be victorious every time, and in the end the horse will absolutely refuse to kick the sack or anything else.

* See SCIENTIFIC AMERICAN for October 8, 1887, page 233.