

EVOLUTION OF MOTIVE POWER

Marvelous Display in the Transportation Building at the World's Fair.

The Primitive and Modern Locomotive

Progress Made in Marine and Railway Locomotion Within a Period of Sixty Years—Ship Models From England.

It is not too hard to say that the transportation building is a blotch on the architectural splendor that surrounds it. This important department of the exposition is housed in a huge structure 500 feet long. The exterior decorations are gaudy and vulgar. Most of the artists who have seen the extraordinary hodge-podge of tinsel and lurid paint regard the whole thing as a huge joke.

The building and its ornamentation are products of Chicago. No other city in America could originate such a laughable combination of cheap pomp and ugliness. But the display inside of the hall is bewildering in its range and variety. The whole history of transportation, from birch bark canoes to steamships, and from pack horses to palace cars, is unfolded in a manner never to be forgotten.

Looking down from the galleries upon the acres and acres of exhibits, one sees a motley array of steam hammers for forging boiler plates which cover the entire floor; a row of famous locomotives facing out from the annex like a herd of elephants, a full section of a colossal ocean steamship, and scattered about here and there, thousands of objects that tell the story of how man has gradually annihilated space.

The invention and development of the locomotive and railway system is the nineteenth century wonder.

Less than sixty years since the first passenger railway ran its first crude train. Now the great civilization has penetrated every corner.

About ten acres of ground floor space are devoted exclusively to exhibits pertaining to railway construction, equipment, operation, management and development. Sixty-four modern locomotives of every type and size from the two 100-ton Deceps engines which stand on the pedestals between the administration building and the railway station, to the five-ton portable engines for use in the forests of Michigan.

Modern Engine Exhibitors. The exhibitors of modern engines are distributed as follows: Baldwin Locomotive works, Pittsburg; Alco Locomotive works, Erie; and showing the machinery in operation by showing it: Brooks Locomotive works, Danbury, N. Y.; Alco Locomotive works, Danbury, N. Y.; Alco Locomotive works, Danbury, N. Y.; Alco Locomotive works, Danbury, N. Y.; Alco Locomotive works, Danbury, N. Y.

Primitive Water Craft. Primitive efforts in the direction of building boats are classified in the following order: 1. Rafts, floating logs or bundles of reeds, reeds or brushwood tied together. 2. Dugouts, hollowed trees. 3. Canoes of bark or skin stretched on frame work or inflated skins. 4. Canoes or boats of pieces of wood stilted or fastened with sinews or fibers of wood or grass. 5. Vessels of planks stitched or bolted together with treenails, with inserted ribs and decks. 6. Vessels of which the framework is set up and the planking subsequently nailed on.

Some Old Engines. Now comes the Chicago & Northwestern Railway with the "Pioneer," built in 1837 by the Baldwin Locomotive works, the fourth engine built by that firm. The Pioneer came to Chicago in 1848 and was the first locomotive to penetrate westward. The engine ran on the old Galena road, now a portion of the Chicago & Northwestern system, and it actually steamed into the exposition grounds a few weeks ago.

Something Akin to Perjury Necessary to Procure One Down There. While walking down Kansas avenue, Topeka, says a writer in the Topeka Call, I passed a large and very brilliant little Kansas drug store, where I had the honor of seeing the maker of the home of the Jim James, I entered and watched to see the matter of this affair get in its work. I had not long to wait.

DRINK IN KANSAS. State of Kansas, Shawnee county, April 12, 1893. I, the undersigned, do solemnly swear that the real name of Phil Meyers, and that I reside at Shawnee county, state of Kansas, that whisky of one-half pint is an essential part of the medicine to be used as a medicine for the disease of hatting, that it is not intended for a beverage, nor to sell or to give away, and that I am a member of the society of individual supporters of the temperance cause, and that I have written on the back of this card the name of the person who has given me this card, and that I will not use it for any other purpose, and that I will not give it to any other person.

Wanted. The undersigned is looking for a good typewriter for his office. He will pay a fair price for a good one. He is also looking for a good typewriter for his office. He will pay a fair price for a good one.

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show a complete water station. A sixty-foot iron turntable seventy feet in diameter, capable of turning a steam locomotive, with table, track scales and pneumatic crossing gates among the exhibits in operation. The main floor of the Baldwin Locomotive works has a ticket office and Thomas C. Sells & Sons a tourist office, both elaborately gotten up.

Rapid Transit Exhibits. No topic is so widely discussed in American cities today as the question of rapid transit through the streets of cities and towns, and this subject is completely illustrated. There are twenty cars by leading makers with many varieties of motive power—horse, cable, steam, electric, gas and compressed air. The original cable car, by A. S. Hallidee of San Francisco, is among the exhibits. Street railway track construction, iron and steel wire cable, electric motor trucks and everything pertaining to street railways are practically demonstrated. A massive steam railway of eight inches gauge, with engines and cars complete, each car having a capacity of three passengers, is shown in operation on tracks 500 feet long. The building, "School of history of elevated railway structures with electric trains are seen in different parts of the hall.

Among the railway bridge models are the Hudson river bridge, the Pennsylvania and the Mississippi river bridge at Memphis. In fact, the railway exhibit is replete with every appliance known to modern railroad engineering. It is a complete history of the progress and development of the railway from its first inception to the present day.

No previous marine exhibit has the grandest display of ships and boats that has been treated as a subject, but in this department are shown, not only the triumphs of naval architecture, but also the triumphs of the modern era—iron-hulled and steely-hulled, but strange and curious craft from semi-civilized and barbarous tribes, showing how the ancient methods of transportation by taking advantage of the currents of water and wind, or bark or logs of wood or skins of animals.

There is a complete exhibit from Alaska and the Pacific coast, including the great Alaskan bark hydra, with complete launching outfit, and from the sea coast of Norton sound a bark hydra, with the full outfit used in launching. The bark hydra is a small boat from the upper Yukon river, built of birch bark and all that goes with them. The Hudson bay company shows all the methods of transportation known to the natives. From southwest Alaska or Queen Charlotte's island are a tiny canoe and a large dugout and halibut canoe.

An Australian Canoe. From Australia comes an interesting canoe built of a single piece of bark. It is commonly known as the log topped iron bark or mountain ash (Eucalyptus Sibiriana), the corked being tied up. The natives in the interior of the continent have a canoe made of a single piece of bark, the ends being tied up with a ball of mud instead of tying them up. This canoe is called "cree," signifying "property," and is used for carrying goods to the main coast. It is used for both hunting and fishing and for transportation.

China is represented by models of every boat used on Chinese waters, both sea coast and inland. These boats, although the architecture seems to be primitive, have many modern features, such as the steam engine, the screw propeller, and the iron hull. The Chinese also show models of their sailing ships, which are built of bamboo and have a very peculiar rigging. The Chinese also show models of their steamships, which are built of iron and have a very modern appearance.

Canada is represented by models of every boat used on Canadian waters, both sea coast and inland. These boats, although the architecture seems to be primitive, have many modern features, such as the steam engine, the screw propeller, and the iron hull. The Canadians also show models of their sailing ships, which are built of wood and have a very peculiar rigging. The Canadians also show models of their steamships, which are built of iron and have a very modern appearance.

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Sweden is represented by models of every boat used on Swedish waters, both sea coast and inland. These boats, although the architecture seems to be primitive, have many modern features, such as the steam engine, the screw propeller, and the iron hull. The Swedes also show models of their sailing ships, which are built of wood and have a very peculiar rigging. The Swedes also show models of their steamships, which are built of iron and have a very modern appearance.

Norway is represented by models of every boat used on Norwegian waters, both sea coast and inland. These boats, although the architecture seems to be primitive, have many modern features, such as the steam engine, the screw propeller, and the iron hull. The Norwegians also show models of their sailing ships, which are built of wood and have a very peculiar rigging. The Norwegians also show models of their steamships, which are built of iron and have a very modern appearance.

Denmark is represented by models of every boat used on Danish waters, both sea coast and inland. These boats, although the architecture seems to be primitive, have many modern features, such as the steam engine, the screw propeller, and the iron hull. The Danes also show models of their sailing ships, which are built of wood and have a very peculiar rigging. The Danes also show models of their steamships, which are built of iron and have a very modern appearance.

Netherlands is represented by models of every boat used on Dutch waters, both sea coast and inland. These boats, although the architecture seems to be primitive, have many modern features, such as the steam engine, the screw propeller, and the iron hull. The Dutch also show models of their sailing ships, which are built of wood and have a very peculiar rigging. The Dutch also show models of their steamships, which are built of iron and have a very modern appearance.

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same as former, 7,500 tons, speed twenty knots, steam, and very like the Sans Pareil, though smaller.

Following those are the Water Witch, Scorpis, Swift, Linnæus, German Ironclad, Koenig, Wilhelm, Kaiser, Zieten, Turkish armorclads Mesonarie, Aomi, Ilah, Portuguese war vessel Vasco da Gama, Alfonso de Albuquerque, Spanish frigates Victoria, cruisers L'Esperance, Zepher, sailing yacht screw yacht Fairy, the Sultan, Brazilian troop ship Porus, tug, mail and other special service boats. United States complete sea coast fleet, including cruiser and armored battle ship will also be shown.

The James & George Thomson company shows models of the first-class battle ship Hamillies, 14,150 tons, eighteen-inch armor, speed 17.5 armed with four sixty-seven-ton breech-loading rifles, ten six-inch quick-firing guns and eight-inch quick-firing guns, second class cruisers Terpsichore, Hethin, Tribune, and the torpedo cruiser Roma Regina, torpedo catcher Destructor and screw steamships.

The Armstrong Mitchell company shows a model one-twelfth full size of the armored ship Victoria, 360 feet long. The model is nearly finished and is the only one that has ever been constructed and shows in the most minute detail every fitting on board of the magnificent ironclad.

Yarrow & Co. show models of torpedo boat destroyers, speed twenty-seven knots; loaded first-class torpedo boats, speed twenty-three knots; second-class torpedo boats, speed twenty knots; and the Opat, built for service in Danzig on Yarrow's system of floating sections, by which means the vessel was shipped in sections and united again in a few days, draught eighteen inches, speed ten miles.

Curand Company's Exhibit. In the merchant marine section the Curand Steamship company exhibits a model of the Arabia, 6,000 tons, and the new ships built and entered in 1892, while the royal mail service between England and South Africa is shown by Donald Currie & Co.

The Laird Brothers of Birkenhead exhibit a collection of models and pictures illustrating the progress of ship building since 1814 to the present time—paddle steamers, screw steamers and a full line of models.

A most interesting exhibit will be made by the London and Atlantic Transport Line showing models of the screw steamers, Massachusetts, Manilla, Mohawk and Mobile, which will be used for the transport of cargo of passengers, live stock, dead meat and cargo of all descriptions.

An interesting model built by Furness, Wigham & Co. is the large ironclad steamship, thirty feet draught, built of steel on a web frame system, with cellular double bottom capable of carrying 6,000 tons of dead weight.

This is only an indication of what the marine exhibit from Great Britain is to be. No such display has ever been attempted in the United States, and especially in an inland city like Chicago. Many of the models have been figured in various naval exhibitions in Great Britain and other countries, and are especially interesting in naval architecture.

The Straits Settlements and Ceylon will also be represented by fantastic models. A peculiar boat in Ceylon is the macha, which is celebrated for its speed. It is the swiftest of all East Indian boats. It carries a large, however, like an ordinary vessel, but must wear around to get the wind upon the opposite side. Its special feature is the keel, the shape of which is at variance with all recognized rules of naval architecture. Instead of being straight or convex, the keel has an arch form, rising in the middle and curving downward at the ends. It is angular, unlike projections, the forward one being deepest. This curious keel serves as a double keel board. Its object appears to be to carry sail well forward so that the whole of the craft will be under the influence of the wind and the propulsion of the keel.

A Catamaran is shown that has carried the mail between Ceylon and the mainland for a number of years, as well as one of the celebrated outrigger canoes. These boats carry a enormous cargo, and the men climb out on the outrigger to prevent the boat from capsizing, and its breezes are blown by one man, two men or three men breeze, according to the quantity of weight necessary to put on the outrigger.

Mediterranean craft are represented by the Turkish catina, dajars of Malta, gondolas of Venice and peculiar boats of the Adriatic. And there are peculiar canoes from the coast of Africa, as well as the libia, a curious development of the libia mara, which is used in the interior waters.

From South America comes the jangala, built on a single bark used in the vicinity of Pernambuco; a war canoe from the Amazon; the cascara, made from a single piece of bark and entirely unlike all birch bark canoes. There are also the slender and swift dugouts from the same locality; balsam from Lake Titicaca, made of straw and bound together by wigs—the only method of water conveyance known to the people of that region. Here you find bingos, curious shaped canoes from the isthmus of Panama, and many others quite interesting.

Of course, the North American Indian and his birch bark canoe are features not only in this building but also in the south pond, with the Indian himself paddling.

Primitive Efforts in the direction of building boats are classified in the following order: 1. Rafts, floating logs or bundles of reeds, reeds or brushwood tied together. 2. Dugouts, hollowed trees. 3. Canoes of bark or skin stretched on frame work or inflated skins. 4. Canoes or boats of pieces of wood stilted or fastened with sinews or fibers of wood or grass. 5. Vessels of planks stitched or bolted together with treenails, with inserted ribs and decks. 6. Vessels of which the framework is set up and the planking subsequently nailed on.

All of these forms have survived in some part of the world. Climate influences or racial peculiarities have imparted to them special characteristics, and with the choice of material necessitated by the product of the locality have determined the particular type.

In the early days of the exposition Great Britain was the friend of Chicago. Thanks to the energetic cooperation of the American and British governments, the first exhibition taken by the British commission, the principal ship building firms have sent a magnificent collection of models of all kinds. The period of iron ship building was represented, both in the models of passenger and freight steamers as well as in the collection of the iron-hulled and steel-hulled vessels of the period after the restoration of Charles II. and through the Napoleonic wars is not included, for with models of the great three-decked sailing battle ships, which were for so many years England's bulwark of strength, the history of the navy would be reasonably complete. At the same time Spain sends the treaty of the royal museum and the models of the Invincible Armada, so that the ships of the time of the famous battle will be shown.

The Thames Iron Works and Ship Building company trace the development of the ironclad in the British navy by means of models. The Warrior was the first war vessel built of iron. She was 380 feet long and was protected with four and one half inches of armor, which was sufficient in 1860 to resist a sixty-eight pound solid shot. The ironclad of that day. Her ends were unprotected and consequently her steering gear was much exposed. The Minotaur represented the next step in the Warrior's career. She was rigged and armed. The Benbow, 10,000 tons displacement, 7,500-horse-power, draught of water twenty-eight feet, speed fourteen knots; eighteen inches of armor, armed with ten-ton guns; 10.6-inch, five-ton, fifteen quick firing guns.

Then come the Grafen, a first-class steel cruiser, 7,300 tons, twelve-horse-power, 350 feet long, armament nine two-inch twenty-ton breech-loading rifles, ten six-inch quick-firing guns, twelve six-inch quick firing guns, four three-pounder quick firing guns, speed nineteen knots; Sans Pareil, armorclad ship, 10,470 tons displacement, in 1867, speed twenty-two knots, draught of water seven feet, speed seven knots, draught of water seven feet, speed seven knots, draught of water seven feet, speed seven knots.

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SMITH PREMIER TYPEWRITER

No. 306 Wood-st., Pittsburg, Pa.
No. 114 West Ninth-st., Kansas City, Mo.

Chamber of Commerce building, St. Paul, Minn.
No. 1627 Champa-st., Denver, Colo.
No. 101 Griswold-st., Detroit, Mich.
No. 61 Niagara-st., Buffalo, N. Y.
No. 407 Powers block, Rochester, N. Y.
No. 116 St. Paul-st., Baltimore, Md.
No. 82 Wisconsin-st., Milwaukee, Wis.
No. 9 Fourth-st., South, Minneapolis, Minn.
No. 47 South Illinois-st., Indianapolis, Ind.
No. 512 Main-st., Peoria, Ill.
St. Joseph, Mo.

In this connection mention may be made of the exhibit to be made at the World's fair by the Smith-Premier Typewriter company. The company pays \$2,500 for the erection and fitting up of a booth 15x15 feet. This will unquestionably be one of the finest displays at the fair.

The following extract from the New York World is of interest:
WASHINGTON, March 27.—The War department of the United States at Washington desired to purchase 150 typewriters, and established a board of experts to pass upon all the typewriters in competition, and after a thorough examination it was decided that the Smith-Premier Typewriter, manufactured at Syracuse, N. Y., was the machine that stood the highest in point of improvements and mechanical construction, consequently the order for 150 typewriters was awarded to the Smith-Premier Typewriter company.

The Associated Press of the state of New York has adopted the Smith-Premier typewriter, to the exclusion of all others, to be used in their telegraphic service in taking dispatches direct from the wire. Seven Smith-Premier typewriters are used daily in The Journal office.

The first display of a typewriter is that it shall do good work at the highest practicable speed.

Second, it must be constructed of such materials and in such a manner

that it will continue to do good and rapid work for a sufficient length of time to make it a profitable investment.

Third, it must operate so easily that it may be run a full day without excessive fatigue.

Fourth, it must be simple in construction and not liable to temporary derangement.

Fifth, its operation must be easily learned and require as few motions as possible.

Sixth, its type must be easily cleaned, as good work is impossible when the type are filled or gummed with ink.

Seventh, its ribbon, if it has one, must have a reliable feeding mechanism which will bring the whole surface of the ribbon in contact with the type with as little tension as possible.

Such are the essentials, and the machine which in the highest degree excels in these particulars is, in our opinion, the most desirable to use, the most profitable to buy, and the most readily sold. In the production of the Smith-Premier the manufacturers have tried to make it conform essentially to all the features enumerated above.

VALUABLE POINTS.
Persons intending Purchasing a Good Typewriter should Carefully Read the Following—

The mechanism of the Smith Premier typewriter for transmitting the power from the key to the type-bar is entirely different from anything ever used on any other typewriter, and is pre-eminently superior to any other device ever invented for the purpose. It makes it possible to arrange the keys in straight rows in all directions; it makes it possible to arrange the upper-case or capital letter keys, in exact duplication of the lower-case or small letter keys; also makes it possible to use steel in the place of wood, as is practiced by other manufacturers. It is the most scientific manner for transmitting power, and it is the most durable arrangement possible. Each key of this machine has the same leverage as every other key, which is not the case with any other mechanism for the purpose. It is the only arrangement yet known whereby it would be possible to make a double case typewriter machine with a full complement of keys in as compact form as in this typewriter, and it does not necessitate a separate room either in front or in the rear of the machine.

The Smith Premier typewriter has seventy-six character keys arranged in straight rows in all directions; the shape of the keyboard is a regular rec-

angle, and the lower-case letters are white, while the upper-case letters, numerals and character keys are black. The capital letter or upper-case keys are arranged identically the same as the lower-case, so that only one set of keys has to be learned, removing the only objection that has been persistently urged to a machine having a full complement of keys. Other machines have a series of levers, made of wood, arranged side by side, with each key attached to a particular lever, which has made it impossible for other makers to produce a keyboard with the admirable arrangement which the Smith Premier Typewriter company has adopted. The keys have celluloid tops screwed upon a steel disc, which is riveted to a steel stem and will never become loose. The characters are inlaid in the keys, are thoroughly durable and present a very fine appearance. Two space keys are used, so that either hand may be employed in spacing.

The ribbon feed of this typewriter is a radical departure from old methods. A compound feed is used which feeds a ribbon one and one-half inches wide squarely across its width at each line of printing. When the carriage is drawn back to commence another line, the ribbon is drawn lengthwise about the width of one type, consequently the entire surface is used. The time required to transfer or feed the ribbon from one spool to another is from two to four days of continuous writing. By thus using the entire surface of the ribbon, the center is not hammered more than the edges, which is the cause of the ribbon curling on other writing machines, and the color of the written sheets is kept uniform.

The type-cleaning device is a radical departure in the typewriter art, and it will be found to be the greatest labor-saving invention which has been applied to typewriters since their introduction. The cleaning of the type of a type-bar machine is the most laborious and disagreeable work pertaining to its use, consequently they are run many times without cleaning, to the detriment of clean-cut work. With this device it is

easy of operation and rapidly, but owing to the inefficiency of the support, its type-bars the alignment has been far from perfect after having been subjected to steady work for any considerable time. However, its advantages overbalanced this defect to such an extent that it has been successfully manufactured and used, but to those who have made the improvement of the typewriter a study, this one defect has received a large amount of thought, and many inventions have been made and patented to overcome it. This would be a very simple matter if it was not for the fact that friction must be almost entirely eliminated, and many devices have been made which work almost perfectly under favorable conditions and fail entirely when slightly gummed by oil or clogged by dust, or corrosion or any of the numerous causes known or unknown which prevent its successful operation.

A series of type-bars mounted on pivots, meet the requirements of an efficient running and rapid mechanism, and the shorter the type-bar and the greater the distance between the bearings, the more accurately they will strike after becoming worn; besides, the shorter bar will work more rapidly and with greater ease. With the old construction the length of the bar is determined by the number of bars to be used in the circle, as the circle (of which the bar is the radius) must be large enough to receive all the bars, consequently the distance between the bearings or pivots of the type-bars could be no greater than the circumference of the circle divided by the number of bars arranged around that circle.

The printing mechanism of the Smith Premier typewriter, while consisting of a series of type-bars distributed in a circle and pivoted to a circle in a common printing point, is otherwise very different from anything heretofore used, and a careful examination must convince any one of its superiority. The type-bars are mounted on hardened steel centers, bearings 1.5-8 inches apart, as compared with 1-4 to 3-8 of an inch in other machines, making 4-8 times wider bearings than its nearest competitor, while its type-bar is the shortest ever used on a double case machine. With the arrangement a series of type bars, 76 in number, with bearings as wide apart as this machine, would require a type-bar ring over 39 inches in diameter with type-bars 19-1/2 inches in length, while with the Smith Premier arrangement the bars are but 27-1/2 inches in length. With this short bar, with its bearings so far apart, the wear of years of steady use should not materially affect its alignment; but if it should, our use, with no other tool than a screw-driver, can eliminate all looseness occasioned by wear.

"Improvement the Order of the Age,"

HAVE YOU SEEN THE NEW SMITH PREMIER TYPEWRITER CHAIR?</