

cient weapons were placed in contrast with a modern Norwegian school-house, and old coins and medals with modern jewels and silverware.

Among the sections of chief interest were the courts of Denmark, Egypt, and Spain. These were set contiguous, fronting the main aisle, and representing in their style and contents three diverse types of civilization. The articles most attractive in the Danish court were terra cotta ornaments, silverware from Copenhagen, Esquimaux apparel, and a rich collection of furs. Across the entrance-way to the Egyptian court was this inscription: "EGYPT—SOUDAN—THE OLDEST PEOPLE OF THE WORLD SENDS ITS MORNING GREETING TO THE YOUNGEST NATION." Entering, the visitor was confronted with a bust of Rameses the Great and a model of the Pyramid of Gizeh. Then came a gorgeous display of the caparisons and gold-studded harness of the steeds of the modern Pharaohs; then cabinets of ebony, costly and quaint; and then an exhibit of Arabic books and manuscripts. The court of Spain was richly hung with Spanish trophies and curtains of velvet. Within were the portraits of those daring adventurers, Cortez, De Leon, De Soto, and Pizarro. The articles displayed were typical of the country and people. Scarfs and shawls, silks and woolens, porcelain tiles and glassware, chemicals and fire-arms, were the chief products exhibited.

Opposite the departments allotted to Sweden stood the court of Japan. The contents surpassed description. The display of bronzes attracted universal attention and universal praise. The porcelains were, beyond comparison, the finest of the whole Exposition—finest in quality and in the immense variety of the exhibit. Richness of coloring—vivid hues of scarlet, green, and gold—prevailed everywhere. Lacquered ware of every variety, superb cabinets, and silken screens embroidered with figures infinite, curious faces, and Japanese costumes, made up a display which astonished the Western mind with the profusion of Eastern art.

China did not half so well—yet well. About the whole display were the anticipated characteristics of overdone conservatism. Here was the expected array of drawings without perspective and designs, consisting wholly of color. Here was a pagoda painted in fantastic hues, and here that China ware—a rich profusion of plates and vases—for which the Celestial empire has had immemorial fame. Here, too, were the beautiful silks, and cloths with gold embroidery, and elaborate bedsteads carved with dragons' heads, and woven forms untamable in tapestry and screen. The polite and impassive man of the

almond eyes and cue—manager of the exhibit—walked among the trophies of his civilization and did reverence before a wooden image of Fo.

The Russian court was placed between the sections of Spain and Austria. An iron statue of the inspired barbarian, Peter the Great, stood like a grim sentinel to guard the treasures of his empire. Much fine silverware, of excellent design and workmanship, was displayed as the exhibit of Moscow. A magnificent piece in *Repoussé*, called THE ADORATION OF THE MAGI, elicited universal praise. St. Petersburg had sent a similar collection, and also a unique group of bronzes illustrative of the life and manners of the Russian peasants. Another section contained a superb chandelier, together with statuettes, caskets, cabinets, and mantels. The exhibit of Russian furs was unsurpassed; and the display of embroidered cloths, velvets, and silks was well calculated to excite the jealousy of more favored lands.

The section of Portugal was found in the rear of the court of Egypt. Glassware, porcelain, and pottery constituted a large part of the exhibit. The life, costumes, and manners of the Portuguese peasantry were here represented by groups of statuary in plaster. The Azores made a beautiful display of phantom ships and flower-baskets woven of the fiber of the fig-tree. Along the south wall of the section was placed a fine collection of geological and topographical maps and charts illustrating the physical aspect of Portugal. The exhibit of raw silk, cotton goods, blankets, and embroidery, was exceptionally good.

Of the African kingdoms—after Egypt—the best and only displays were made by the Orange Free State and Tunis. The court of the latter was located in the rear of the sections of Denmark and Turkey, and was almost exclusively occupied with the personal exhibit made by the Dey. The collection consisted of articles illustrative of the manners and customs of the Bedouins, and of antiquities from the ruins of Carthage. The court of the Orange Free State occupied the southwestern angle of the building, and was wholly devoted to the governmental exhibit made by the authorities of that country. An unexpected array of minerals, native woods, ivory, grains, mohair, and wool, composed the chief part of the collection. But the cases containing the wealth of the feathery races of South-eastern Africa, from the infinitesimal humming-birds of Madagascar to the straggling descendants of the *dinornis*, were of still greater interest and beauty.

No department in the Main Building was more admired and



praised than the court of Brazil. Dom Pedro and his queen had no cause of shame in the presence of their national exhibit. The Brazilian pavilion was located between the courts of the Netherlands and Belgium, and was characterized throughout by elegant magnificence of structure and contents. At the entrance was a brilliant display of flowers and designs delicately woven from the plumage of Brazilian birds. Topographical maps and photographs illustrated the physical aspect of the country; while the splendid display of tropical woods, together with the finest of coffees, yams, ginger, and rice, revealed the true riches of the empire.

The minor South American States were also fairly represented. The pavilion of Peru was tastefully ornamented; the contents, of value and interest. Gold, silver, cinnabar, copper, iron, and lead, were the principal minerals exhibited; coffee, pepper, cinnamon, cocoa, caoutchouc, and cinchona, the chief vegetable products. The court of Chili was of similar sort, and contained some fine specimens of silk and worsted-work; but the most interesting part was the case filled with the stuffed skins of Chilian wild animals. The exhibit of the Argentine Confederation was chiefly of ores—gold, silver, copper, and lead. The display also embraced fine specimens of building-stone, quartz, and plumbago. The manufactures were, for the most part, of leather; and handiwork was mainly illustrated in a collection of native weapons.—Far Hawaii, also, had a pavilion of considerable interest, containing a collection of birds, shells, and sea-weed; fans, ferns, and feather-work.

Mexico, with her pseudo-Latin civilization and anarchic republicanism, had pitched her court next to that of the United States. The pavilion was Aztec in its style, with hints of a more modern date. The exhibit was principally historic, consisting of antiquities and remains. The display of manufactures embraced some fine silks and elegant leather goods. Here were effigies of Mexican cavaliers, formidable as Quixote in armor. Here were native wines and medicinal plants, and here a fine collection of ores—silver, galena, and iron. But the exhibit in its entirety was neither striking nor extensive.

In the Carriage Annex the observer found much to instruct and amuse. For here were the ridiculous vehicles which the fathers made their journeys in—old Virginia or Concord coaches, heavy enough for a fortification. But here, in contrast, was the full triumph of modern art in the combination of the ornate and the useful. All things elegant and luxurious of silver-palace car or private carriage

studded with gold, and all things prosy of spokes and hubs and harness, were here displayed in profusion. Here again Brazil, competing with Pullman and Woodruff, presented a splendid coach from the Rio Janeiro Railway. Here Canadian sleighs and sledges were contrasted with the diminutive coaches of Italy and the substantial vehicles of Old England.—And so the rambler, passing under the western arches of the Main Building, found himself in the open air, facing the Bartholdi Fountain.

The way across the beautiful esplanade led to Machinery Hall.



INTERIOR VIEW OF MACHINERY HALL.

Entering at the southeastern portal of that great edifice, the observer came at once into the department of the German Empire. Immediately before him stood the famous Krupp guns, gigantic twelve hundred pounders, black and terrible as the Miltonic artillery. Several rifled cannon of smaller caliber were set in contrast; and just across the aisle was a pyramid of iron-ore, showing the material out of which the great guns were cast. On the opposite side of the battery was exhibited a brick-making machine from Berlin. Near the southeastern angle of the building, the Gas Motor Factory of Deutz displayed a peculiar engine in which the piston is propelled by the explosion of gas. The best steam-engines exhibited in the German section were from the works of Leipsic.



The department of France embraced the northeastern division of the ground-floor. Near the entrance thereto was placed an elegant pavilion in which were illustrated the processes of working in brass and copper. The confectioners' section, where bon-bons were made and sold, came next, and then the department of Parisian soaps and cosmetics. In this part also stood the silk-looms of Lyons, and further to the north a set of machines illustrating the processes of lithography. An apparatus for the manufacture of beet-sugar was also exhibited, and an ice-making machine from Paris. The rest of the French contrivances had respect, for the most part, to fashionable wants and the avocations of polite society.

Further westward was placed the section of Belgium. Chaudron of Brussels led the exhibit with an effective and tremendous machine for boring wells.\* Car-wheels and axles from Louvain, a trip-hammer and steam shears from Marcinelle, and models of machinery for the manufacture of stearine, were the next attractive features of the display. A splendid exhibit of wool-carding apparatus was presented as the contribution of Verviers; and the city of Ghent added a superb horizontal engine, built for the mint at Brussels.

The Northern nations had contributed little in the way of machinery: Denmark nothing at all. Sweden made a small but respectable display in the way of trip-hammers, stationary engines, one small locomotive, a fire-engine, and several sewing-machines. The contribution of Norway consisted of some odd-looking machinery for working in wood and metal. The Russian display was almost wholly of artillery—partly good, partly indifferent in its quality. In the same vicinity was the fine exhibit made by Brazil, consisting of models of dry docks and men-of-war; military and naval enginery; arms, accouterments, and munitions; stationary, locomotive, and fire-engines; pumps, pin-making apparatus, and machinery employed in the Imperial mint.

The best of the exhibits made by foreign nations was that of Great Britain. Two of the Rochester traction-engines, standing near the eastern entrance to the hall, were much wondered at and praised. So, also, the fine carding-machine just opposite. Manchester made a fine display of steam hammers, circular saws, and enginery of coinage and stamping dies. The armor-plate exhibited here was the best ever produced, ranging from nine inches to twenty-two inches in thickness,

\* It is clear that, in respect to machines for upland excavation, the Americans have much to learn. That whole line of contrivance, beginning with the plow and ending with the dredging-machine, is subject to great and radical improvements.

seemingly impenetrable. The Applebys of London exhibited two of their tremendous cranes—giants after their kind. English sewing-machines—mostly of the hand-power pattern—were plentifully displayed. In the sections near by, the spinning and winding of cotton thread was illustrated, and further on, the delicate looms for weaving silken badges were in operation. Gadd of Manchester exhibited an engine capable of printing calicoes in eight colors at one impression. An effective system of railway switching and signaling was shown by Brierly and Reynolds of London. In an adjoining square stood a fine model of an Inman steamship, and east of this a Walter printing-press in operation. Farther on, Tait and Watson of London displayed a collection of machines, including a sugar-mill, a valveless engine, and centrifugal drying-pans.—Across the aisle was the exhibit of Canada, New Brunswick, and Nova Scotia,—embracing turbine wheels, a set of railway signals, quartz-mills from Halifax, Toronto marbles, fire-engines, sewing-machines, and Indian canoes.

Of the American department—three-fourths of the whole in extent—the greatest trophy was the Corliss vertical engine, standing in the middle of the central aisle. The platform was fifty-six feet in diameter; the stroke of the piston, ten feet; the weight of the fly-wheel, a hundred and twelve thousand pounds. It required twenty tubular boilers of large capacity to furnish the proper amount of steam. The periphery of the fly-wheel was geared with cogs into the underground line of shafting, and the power applied was equivalent to that of fourteen hundred horses; but the movements of the great engine were smooth and noiseless.

From the central station, the observer, glancing down the south transept, had a full view of the Hydraulic Annex. Here pumps of every grade and fashion were pouring their torrents into a vast tank having a capacity of sixty-three thousand cubic feet of water. An interesting display of steel ware was made in a section near by, and further on, an exhibit of metal piano-frames by the Steinways. Here the process of making nails and tacks was illustrated, and there a machine was cutting corks. On this hand was an extensive collection of files and screws, and on that a pyramid of grindstones. Farther on, to the west, was an exhibit of rolled iron, and next, a large display of axles and machinists' tools. A huge brick-making machine, capable of moulding four thousand bricks in an hour, was fairly matched with a mammoth planing machine, weighing a hundred and sixty-two thousand pounds, and having a traverse of forty-four feet. In an adjacent section, paper envelopes were made by an automatic



apparatus at the rate of a hundred and twenty per minute. Worcester, Massachusetts, contributed a collection of edged tools, dies, and presses; and Paterson, New Jersey, a machine for spinning silk. On the central aisle model steamers, men-of-war, yachts, and life-boats were exhibited. Next came the sections occupied with Hoe and Bullock printing-presses; then the book-binding, stereotyping, and electrotyping display, and then the splendid roller-drum book-press of Cottrell and Babcock, New York. A type-writer stood near by, and farther on was a section where all the steam- and sailing-vessels owned in the ports of Massachusetts were exhibited by models.

In the department of confections the American display rivaled that of France. Close to the bon-bon section were placed some fine wheat-cleaning and centrifugal sugar-drying apparatuses. Then came an old Virginia tobacco factory, where all the processes of making were exhibited. And the colored people, as they wrought, made the hall resound with the weird plantation melodies of the Southland. Farther east the manufacture of India-rubber shoes of all sorts and sizes was illustrated by the actual processes of the art. Then came the glass-blowers' exhibit, and then an excellent display of wall-paper by the Howells of Philadelphia. A collection of washing- and wringing-machines caught the attention for a moment, and then the observer found himself before the huge sugar-refining apparatus exhibited by the Colwell Iron Works of New York. The Wharton automatic switch was exhibited near by, and then came a splendid display of common and platform scales. Mining machinery was shown by the Dickinson Company of Scranton, and American locomotives—unsurpassed by any in the world—by the Baldwin Works and the Pennsylvania Railway. In the adjacent section the Westinghouse air-brake and the Henderson hydraulic-brake were exhibited in sharp competition. The Backus water-motor here attracted much attention, as did also an odd hydraulic-ram near the western entrance. The department of American power-looms—rivaling those of the best European factories—was constantly thronged with visitors, and the section where Waltham watches were made was a similar scene of eager interest. The Pyramid Pin Company of New Haven exhibited a quaint little machine for sticking pins in papers. A powerful hydraulic cotton-press was shown by the Taylor Iron Works of Charleston, and a magnificent collection of wire ropes and cables by the Roeblings of Trenton.

The display of railway bars—iron and steel—was, for the most part, made by the works of Pittsburgh. Among the western sections

of the hall some fine ditching and draining enginery was exhibited; and near by was the display of American knitting-machines. Of sewing-machines the exhibit was unrivaled. The competition reminded the observer of that among the piano-fortes in the Main Building. Every form of patent, from the original Howe to the most recent innovation, was duly praised by its group of advocates and admirers. The American Steamship Company exhibited their vessels by models, and eastward from their section stood a handsome pavilion containing an unlimited assortment of saws. The department of fire-engines and extinguishers was adjacent; and near by, the famous Weimar blowing-engine and an apparatus for charging blast-furnaces were displayed.

Many relics of old machinery were exhibited in various parts of the hall. Chief of these antiquated contrivances was a section of THE FIRST STEAM-ENGINE ever used in the United States,—an odd piece of mechanism of the Cornish pattern, which was brought to America in 1753 and set in operation in a copper-mine near Newark, New Jersey. The first saw-maker's anvil, imported in 1819, was exhibited near by. In another section were several pieces of excellent workmanship from the mechanical department of Cornell University. An automatic shingle-machine, having a working capacity of twenty-five thousand shingles per day, was an attractive object in an adjoining division; and in the same space the work of dovetailing, moulding, carving, and paneling by machinery was illustrated. Then came the work of barrel-making, shown by the actual processes; then an exhibit of scroll-saws in operation; then blast-furnaces by models, steam drills, gas apparatus of every variety, and a machine for crushing anthracite coal.—Taken all in all, the exhibit of American machinery was the finest display of the kind ever made by man.

On his way from the western entrance of Machinery Hall to the Government Building of the United States, the observer would hardly fail to pause and admire the Roman Catholic Total Abstinence Fountain, one of the most beautiful of the outdoor works of Fairmount Park. Thence a brief walk northward on Belmont Avenue brought him to the edifice erected by Congress for the exhibition of the functions of the American Government in times of peace, and its resources in war. The building itself has already been described. Without, to the east, stood a model monitor, having the same dimensions and appearance as the original. In the same vicinity a huge Rodman twenty-inch gun and others hardly less formidable were exhibited. On the south, also, many pieces of heavy artillery were displayed, together with shot,

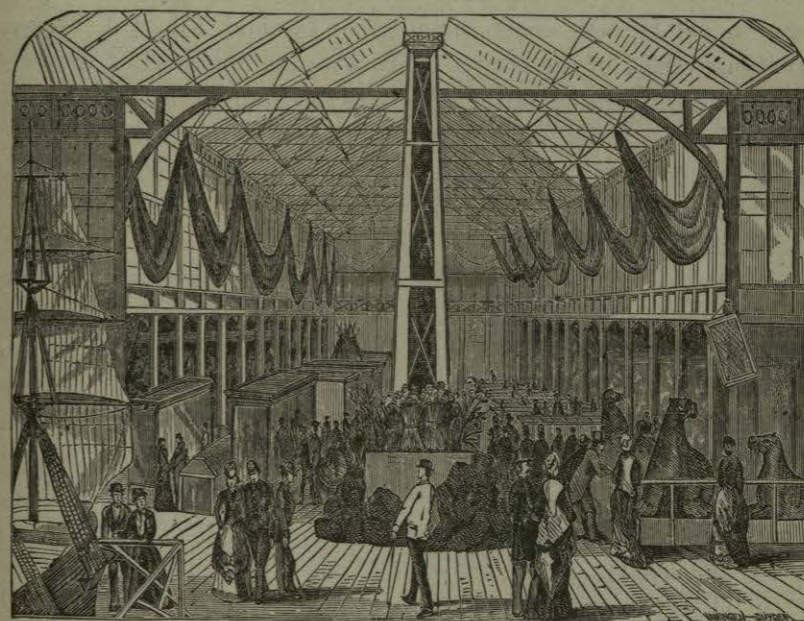


shells, and projectiles of various kinds. Here, too, were the boats *Faith* and *Advance*, used by De Haven and Kane in their Arctic voyages. Near by, two postal cars, for the fast-mail service of the United States, were exhibited by the Post-office Department. On the north, the War Department made a display of pontoons, bridge trains, and army wagons. Within, the south division of the principal transept was occupied with the Centennial Post-office. Here the mails were regularly received and distributed with systematic precision. The subordinate sections of this department were named respectively the divisions of Topography, of Books and Blanks, of Mail Equipment, and of Stamps. In the last section a machine of unimaginable ingenuity was displayed, having an automatic capacity to cut, fold, gum, stamp, count, and pack, the Government envelopes.

Another large display in the Government Building was made under the auspices of the Agricultural Bureau. The subordinate divisions of this exhibit were of Statistics, Chemistry, Botany, Microscopy, Entomology, and Horticulture. In the first named of these sections were large outline maps of the United States, showing the areas of forest- and farming-lands, the various products and capacities of soils, the distribution of animals, etc. In the department of chemistry was a fine and well-arranged exhibit of the earths, together with illustrations of the processes of growth, fermentation, distillation, and the like, as well as the methods of manufacturing vegetable products. In the botanical division the various woods of the United States were exhaustively exhibited. The collection was very extensive and valuable, embracing sections of nearly every species of wood growing between Central America and Canada, and from Passamaquoddy to the Golden Gate. The microscopic section was occupied with a series of charts and drawings illustrative of vegetable diseases. The entomological division was chiefly devoted to an exhibit of insect-eating birds and of what creatures soever prey upon the farmer's fruits and grains. In the horticultural section a display was made of those plants which have an economic and commercial value, such as corn, tobacco, cotton, and flax.

The exhibit made by the Department of the Interior was composed chiefly of the well-known treasures of the Patent Office and the National Museum at Washington. In addition to these, special displays were made by the Land and Indian offices, and by the Bureaus of Education and Pensions. Here, also, was exhibited a complete set of the census reports from 1790 to 1870, inclusive. But surpassing all in interest and value was the magnificent exhibit made by the

Smithsonian Institution. This extraordinary display embraced, first of all, a classified collection of the animals of America. These animals were grouped according to the relation which they bear to man, as *useful or injurious*; and the exhibit included all those contrivances and implements which man employs in capturing them when wild, or subjecting and controlling them when domesticated. The collection illustrative of the fishery resources of the United States was equally complete and full of interest. In the department of American ethnology an extensive exhibit was made of aboriginal implements and contrivances peculiar to the primitive modes of life. The last branch



INTERIOR VIEW OF THE UNITED STATES GOVERNMENT BUILDING.

of the Smithsonian contribution was that illustrating the mineral resources of the United States—a collection of great extent and value.

The first section under the auspices of the Treasury Department was devoted to the exhibition of the money, money-making, and medals of the national mint. The special display, made by the Lighthouse Board, of lanterns, reflectors, sea-signals, and electrical and calcium lights, fairly rivaled the great exhibit of similar apparatus made in the government building of France. The whole collection was of the highest order, and gave token that no branch of humanitarian science is making more rapid strides than that which appertains to the perfection of light-houses and the safety of mariners.

The Navy Department made an exhibit of torpedoes, and of the



methods of using them in naval warfare. The collection embraced all of the patterns of that terrible engine, from the original as invented by Fulton, to the more modern forms produced by Ericsson and Lay. Another section was devoted to marine arms and armor, shot, shells, munitions, uniforms, and what weaponry soever is peculiar to men-of-war. The Naval Observatory exhibited—besides its own publications—a fine collection of photographs and chronometers. Here, too, were found most of the precious relics of the Arctic explorations, from the voyage of De Haven to that of Hall.

The exhibit made by the War Department was still larger and more complete. In this division was arranged the splendid display of the Signal Service under direction of General Albert J. Meyer, chief signal officer of the army. Here were exhibited all of the delicate instruments and tentative apparatus peculiar to the half-formed science of meteorology; and here the methods of observing and recording the multiform and many times capricious phenomena of earth, air, and sky, were fully illustrated. The Engineering Corps also contributed an interesting exhibit, chiefly composed of maps and drawings illustrative of the coast, lake, and river improvements of the United States during the past century. The section of the Ordnance Service was devoted to the display of fire-arm manufacture as the same is carried on at the Government Armory at Springfield, Massachusetts. The making of cartridges was also fully illustrated by the actual processes. Next came the exhibits made by the Post Hospital and the Laboratory—full of interest after their kind—and, last of all, the model light-house standing at the northeast angle of the building, without, and not far off the tremendous fog-horn called the *Siren*.

In the extensive exhibits of Agricultural Hall—varied and full of interest, as they were—there was, of course, a less display of human skill and a greater revelation of the beneficence of nature. For here the products exhibited were, for the most part, the offspring of the ground—the fruits of air, water, and sunshine. In this vast hall, the agency of man extended but little further than the modification and utilization of the gratuitous riches of the world. The display, therefore, was in a large measure limited to the collection and exhibition of things uncommon and prodigious.—A brief summary of the objects of principal interest in the various departments of the hall may here suffice.

The products of the United States occupied more space than did those of all other nations combined. And the general superiority of American exhibits over those of foreign lands was noticeable from the

first. In the northeastern division of the hall were placed the sections of agricultural implements, plows being a specialty. The exhibit made by Speer and Sons of Pittsburgh, as well as that by Oliver Ames and Sons of North Easton, Massachusetts, was specially varied and excellent. In a section to the north were shown rakes and threshers of the most approved patents, and in the same collection a specimen of Foust's hay-lifting machine, which called forth many commendations. Near by stood the superb plows manufactured by the Oliver Chilled-Plow Company of South Bend, Indiana.\* Farther on was another collection, by the Higganum Plow Company of Connecticut; and then came a section of gang-plows, exhibited by Collins and Company of New York.

In the department of reapers and mowers all the great makers were fully represented. The Sweepstakes, Harvester, McCormick, Champion, and Buckeye machines were specially conspicuous in the exhibit. The Union Corn Planter, from the shops of Peoria, Illinois, attracted much attention, and the superb Westinghouse steam-thresher was greatly praised. An excellent reaper, called the Planet, was shown by the Wayne Agricultural Works of Richmond, Indiana. Slosser's self-loading excavator—a powerful ditch-digging machine—stood close by; and near the eastern entrance was exhibited one of the well-known Adams Power Cornshellers.

Grain-drills next attracted attention, especially the display made by the Farmers' Friend Company of Dayton, Ohio. In the south end of the central transept several excellent cider-mills were exhibited in operation—that of Boomer and Boschert leading the collection. Farm scales were shown by the Howe Manufacturing Company, and farm saw-mills by Harbert and Raymond of Philadelphia. In this vicinity two models of stables—one of wood, and the other of iron—were exhibited, and also some fine horse-powers from Racine, Wisconsin.

The observer next found himself in other scenes, amid the American wine-growers' exhibit, near the northern entrance. The California display was first in excellence and extent. After the vintage of the Pacific Slope came the fine exhibits of Ohio, Missouri, and New York. South of the wine collection, at the bisection of the nave and transept, stood a large bronze fountain, throwing high its cooling waters; and at the four angles round about was set the display of canned fruits and meats, hops, malts, and spices. Here, too, was a

\* One plow exhibited by this firm was perhaps the finest ever made. The metallic parts were plated with nickel, and the rosewood frame was splendidly embossed with agricultural emblems.