

**A LARGE STATIC MACHINE.**

Messrs. Waite & Bartlett, of this city, have just completed for Dr. F. A. Gardner, of Washington, the largest influence or static machine ever made. It is to be used for generating electricity applied as a therapeutic agent, and it is of sufficient size to admit using it for the treatment of several people simultaneously.

Presuming our readers are familiar with ordinary static machines as described in several numbers of the SCIENTIFIC AMERICAN and SUPPLEMENT, we will confine ourselves to a brief description of this particular machine.

The machine is furnished with a hermetically sealed case made of quartered oak and plate glass. The case is 10 feet long, 5 feet wide, and 7 feet high inside and is supported a few inches from the floor by six legs.

The main shaft, which is of steel, is 2 inches in diameter and turns in ball bearings. It carries eight plate glass plates 60 inches in diameter and 3/8 inch thick. Between the circular glass plates are supported the fixed plates which carry the armatures.

The conductors extend through the casing and are provided with spherical terminals 8 inches in diameter, and with condensers and sliding discharge rods.

A small Toepler-Holtz machine having a 28 inch revolving plate is placed in the casing, and may be brought into connection with one of the armatures of the large machine, when it becomes necessary to renew the charge. The small machine may be driven by hand; an electric motor operates both.

This machine is capable of yielding a 30 inch spark of large quantity. The discharge is terrific. It requires a person of unusual nerve to remain quiet during the disruptive discharge of the machine, and yet the current can be controlled so as to admit of treating the most delicate and sensitive parts of the body.

The machine, taken altogether, is a very creditable piece of work, in which the makers may justly take pride.

**THE KING OF SIAM.**

The close of the season which was marked by the Diamond Jubilee celebration was invested with special interest by the visit of the King of Siam, the latest Oriental potentate to declare himself a supporter and advocate of European culture and progress. The portrait we publish of his Majesty, King Chulalongkorn, and some of his sons, will give our readers a good impression of this highly intelligent and amiable ruler of what may be called the last virgin kingdom of Asia, and that impression will certainly be confirmed and strengthened by closer intercourse. The world has heard a good deal and seen ample proof of Japanese receptivity and go-aheadness. The prediction may be hazarded that now that the Siamese have decided to imitate Europeans, they will show not less intelligence and energy in shaking off the trammels of centuries and in catching up the age. It is both fortunate and gratifying that the present sovereign of Siam, to whose initiative and example the change is mainly due, is inclined to regard this country with a special admiration, and to take English customs as his pattern and example.

Chulalongkorn has had a long experience of the work of government, having succeeded to the throne in 1868, when he was only fifteen years of age, and during that period he has seen his country pass through several grave crises, of which the most serious occurred only three years ago, when it seemed as if French ambition could not be warded off. Everyone acquainted with the diplomatic history of that episode is aware that the good sense and patience of the King played a prominent part in effecting the pacific settlement that was finally attained in the spring of last year by the convention signed by England and France. That convention guarantees the independence and neutrality of Siam, and could not be broken by either of the signatories without bringing the other into the field as the champion of

Siam. Its practical value and significance therefore is that Siam has obtained a breathing space which will enable her to develop her resources, introduce needed administrative reforms, and generally strengthen her position. How clearly the King has seen these facts, and how quick he has been to begin the necessary measures, is shown by his early departure for those foreign lands to which his own has now to assimilate itself.

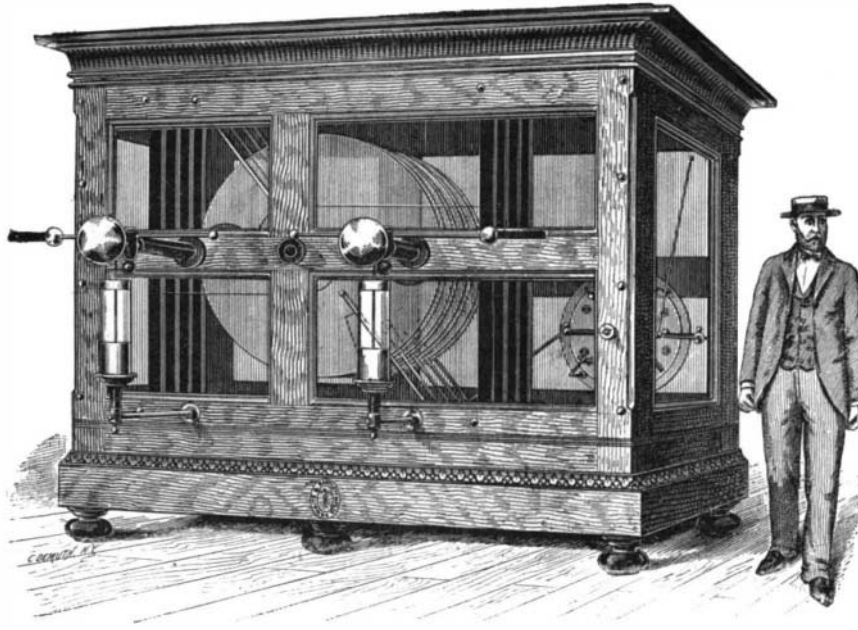
King ordered that only English should be spoken at his table. His Majesty has also specially arranged for the education of his sons in the first place in England.

The Crown Prince Somdet has an English governor, Col. Hume, an officer who served for a long time on the staff of Lord Roberts, in India, and several English tutors have superintended his studies. He is a young and intelligent prince, of whom every one speaks well, and who worthily represented his father during the recent ceremonies. The next son, Prince Borapat, although now a cadet at the Potsdam Military School, also had the basis of his education laid in this country, and when he was sent to Germany to undergo the severe military and educational training to which princes are subjected in that country, he astonished his examiners by the excellence of his papers at the preliminary examination. The board sent the Siamese prince's replies to the Emperor William, who, in turn, passed them on to his sons with the comment, "These are what good examination replies should be like." The third son, Prince Abha, has been specially educated for the sea, and was trained at one of our best naval schools at Greenwich. We believe that he was allowed by the First Lord of the Admiralty to take part in one of the naval examinations, and that he did remarkably well in most of the subjects, and only broke down in "religion," which is scarcely surprising. He accompanied his father on board the Mahachakhri, on which he is rated as a midshipman,

and he was intrusted with the steering of the vessel through the Suez Canal. Capt. Cumming, the commander of the yacht, reported that he performed this task very skillfully. Enough has been said to show that not merely is the King of Siam a well educated and well informed prince himself, but that he has taken very special pains to make his sons and successors competent to discharge the onerous duties of their exalted position under more severe conditions than in the past. The conclusion is, therefore, obvious that Siam stands on the threshold of important changes, and that in another generation it will have become a very different kingdom from what it was quite recently.

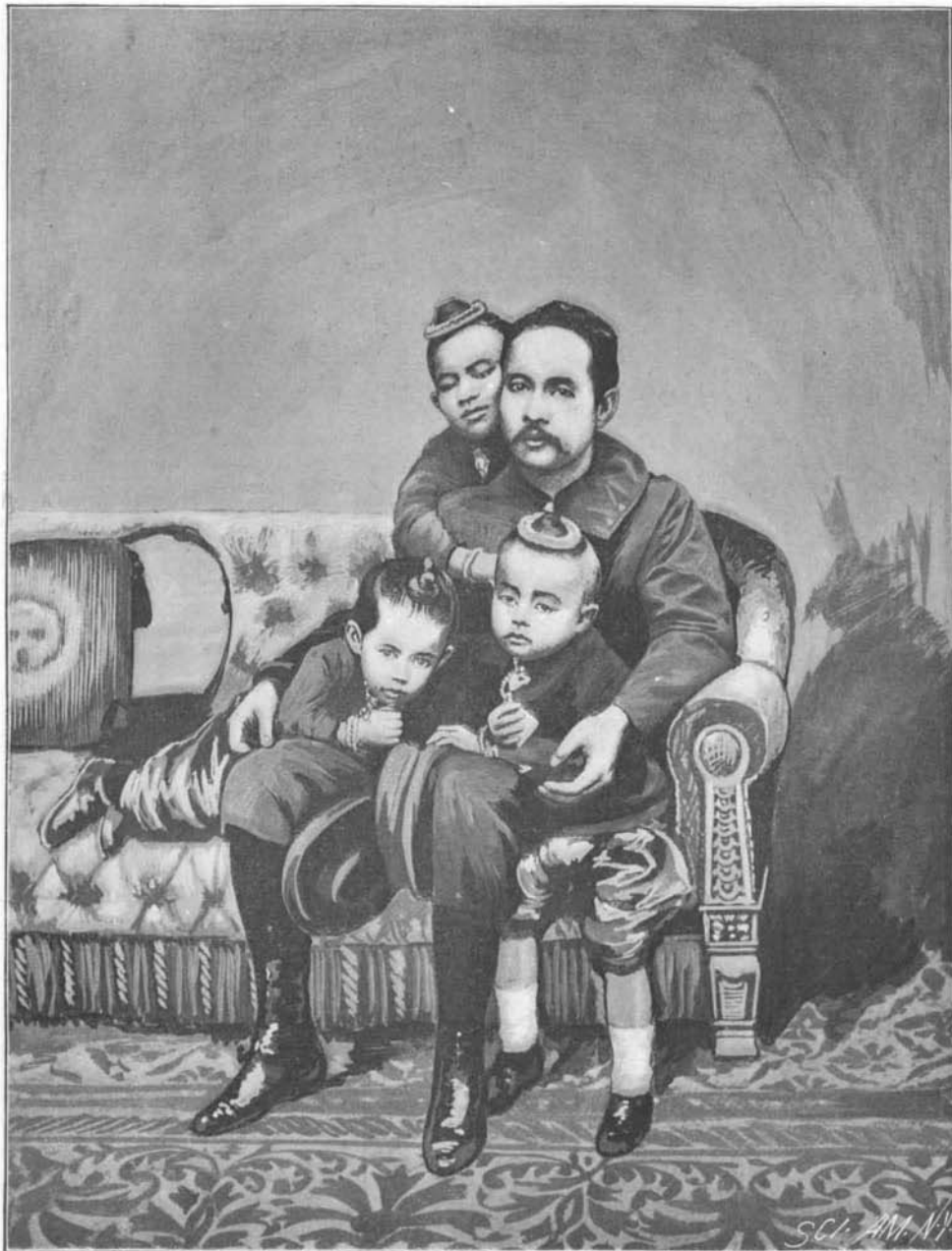
This change can undoubtedly be accelerated by the encouragement and co-operation of the English authorities and capitalists, and seeing that our intercourse with the country goes back 300 years, and that the latent wealth of the kingdom is immense, we should fall very far short of our traditions if we held back from utilizing so promising an opening. The serious object of the King's visit is to study our manufactures and mechanical processes, and to introduce such of them as are feasible into Siam. Then there follows the question of attracting foreign capital for the construction of railways and the working of mines. Foreign capital is undoubtedly timid of embarking on any ventures in Asiatic countries; but Siam offers a secure as well as a specially favorable field, and the support of the King and the chief members of the royal family provides a sure guarantee that is absent elsewhere. It is therefore reasonable to count on a special measure of success in this respect as the direct outcome of the King's visit. Commercial men can scarcely fail to realize and appreciate the possibilities of trade in the Menam, or of the development of the southern provinces of Siam, where tin and gold are known to abound. But political considerations not less strongly point to the advantages that must accrue from the development of Siam, and from placing her, as it were, firmly on her own feet. We are the supporters of Siamese autonomy, but as much cannot be said of the French, who are always complaining of the Siamese, and who seem to regret the convention that ties their hands, although we only yielded to them on the Upper Mekong with the object of effecting a pacific and satisfactory arrangement on the town, Menam.

We cannot forever stand in the path before a decrepit Siam, and therefore that country has to regenerate itself and to establish its



GIGANTIC HOLTZ MACHINE.

If the King has visited Europe from those high and meritorious considerations, it must also be admitted that his decision brings within our ken a very charming personality. No Oriental potentate will leave a more favorable impression behind him than the Siamese ruler, whose character, disposition, and deportment will attract unqualified admiration here as placing his Majesty at once en rapport with English gentlemen. The King's knowledge of English, which dates back from the time of his childhood, when he began his studies under an English governess, is very considerable, and will undoubtedly simplify his relations here, and at the same time contribute to a more perfect and harmonious understanding. It is stated on good authority that during the voyage to Italy from Bangkok on board the royal yacht Mahachakhri, the



THE KING OF SIAM AND CHILDREN.

own title to be respected. This is what the King fully realizes, and he has taken on himself the task of showing his subjects by his personal example the road they have to follow.—St. Paul's.

#### The Recent Floods in Eastern Germany and in Austria.

The American papers have taken little notice of the dreadful floods that have produced such destruction in Germany and Austria. The region stretching from east to west between Silesia and the kingdom of Saxony was, in the closing days of July, the scene of dreadful catastrophes, the ultimate cause of which were heavy rainfalls. These reached their climax on the 29th and 30th of the month and affected primarily the mountainous districts, flooding the northern slopes of the Erzgebirge and the mountains of Saxony and Bohemia. But the swollen rivers soon poured their overflow broadcast over the prosperous valleys, and the waters of the Elbe and Mulde reached in quick succession the towns of Bitterfeld, Dessau, Wittenberg and Magdeburg, within the first week of August. At the same time the Neisse and the Bober were working harm in Silesia. Not till August 5 did the Danube endanger the Hungarian lowlands from Presburg downward.

The awful extent of the disaster may be imagined from the figures obtained by the Meteorological Institute of Chemnitz, Saxony, as representing the total rainfall on the two days above mentioned for the kingdom of Saxony alone. Over 160,000,000 cubic yards of water were recorded. The losses were alarmingly great. In Silesia the total damage suffered was estimated at \$5,000,000. In Saxony, not taking into account the destruction of all harvest products, we must take the damage sustained to represent at least \$17,000,000. At Hainsberg, near Dresden, where the two Weisseritz rivers unite, the floods tore down the railway embankments, damaged some factories, destroying 90 tons of merchandise, swept away several storehouses, and devastated the fields. One arm of the river branched out and sent a tearing torrent through the principal street of the city, whereby houses were undermined and building after building was razed to the ground, the street being soon left one string of desolate ruins. Some houses have disappeared altogether, leaving no trace on their former sites. The flood swept away people, cattle and animals of all sorts, houses, furniture, altogether, in one current. The water got into the mines in the neighborhood, playing serious havoc with them. The ground was so rent by the water that it finally gave way, and a large factory was almost entirely demolished, the water rushing down the pit, carrying with it many people. Private houses and shops

often buried human beings under their ruins, in one case ten persons at one time. Thirty houses were destroyed in Hainsberg, thousands of animals were lost, and many families reduced to beggary.

The valley of the Mulde was more fortunate, and the losses are mostly of property. The crops are swept away, only a very small fraction being recovered from the water.

In the Riesengebirge the floods were rendered all the more dreadful by the fact that most people were surprised by them in the night, and very few were able to save more than their lives. Trees and roofs were full of people clamoring for help. Others, who would or could not part from their possessions, were drowned. Many houses have disappeared, leaving no trace of their position, among them the electric station of the village of Schreiberhau. Fifteen houses and many barns, etc., were utterly destroyed. The calamity was further increased by the gas lamps giving out, leaving the struggling men and women in the dark night. Of one street scarcely anything is left, and another has lost some 330 feet.

South of the Schneekoppe (the highest mountain of the Riesengebirge), the little brook Aupa, ordinarily very harmless, swelled to a powerful torrent and inundated the city of Trautenau. Floods had been witnessed there in 1858 and 1882, but they did not approach this year's in extent. The firemen of the locality took up the rescuing work, and in one case assisted a physician, Dr. Maly, in saving 32 people from certain death. On one occasion, a child floating about in its cradle was saved. Fourteen bodies were picked up which were so mangled that they could not be identified.

In Marschendorf twenty-eight houses were utterly destroyed and thirty more very badly damaged.

Vienna, too, was partly flooded, but here, thanks to the excellent provisions against such emergencies, no serious harm was done.

In a number of other places the floods worked great harm, taking many lives and devouring millions of property; the fields having been made unfit for cultivation for several years to come. Great poverty will necessarily come to many people in a land where money is scarce at all times. Collections were, of course, set on foot by many persons to alleviate the evil, and the governments, too, are inquiring into the matter, with a view of ascertaining the extent of the damage done and the aid that can be given.

THE records of the United States Patent Office show that upward of 6,500 forms of car couplings have been patented in this country.

#### Restrictions in Use of Wood for Interior Fittings of Ships.

As the result of the experiences drawn from the battle of the Yalu, the use of wood has been much restricted in the new German ships, according to Herr A. Dietrich, Constructor in Chief of the Imperial Navy, says the Proceedings of the United States Naval Institute.

"In the outfit and construction of the new German ships wood is used only for a few minor points. Wooden deck planks are no longer laid; steel deck plating is covered with linoleum, sometimes over a layer of cork. In the crews' quarters the sides of the ships are not ceiled. In the officers' rooms the ceiling is made of steel plates  $1\frac{1}{2}$  millimeters thick and lined with cork. For cabin bulkheads the steel is covered with thin woolen cloth, and with cork lining underneath where it is desirable to exclude sound or lower the temperature. Where heat is radiated from engine or funnel casings, cork lining is resorted to. All wood is removed from the ammunition rooms, save the racks for shells and powder charges, which are still made of wood. For all ladders and steps steel is used. The handrails on the conning bridges are no longer of wood, but of some other material which will not burn or splinter, and which is more agreeable to the touch of the hand than steel or brass. Chart-houses and captains' rooms on bridges are entirely made of steel and fitted out with non-combustible materials. Since all such changes will be a little exaggerated, it seemed to be advisable to abandon wood for the interior fittings, and especially for the furniture, and to resort to fireproof material which will not splinter. Many things were tried. Furniture was made of steel and aluminum, lined with cork and covered with linoleum or canvas; but it was not equal to wood furniture. Only the bedsteads are constructed of iron, steel or brass. The insignificant quantity of wood in the few pieces of furniture when ignited is not a dangerous source of smoke, but rather it is the outfit of the staterooms, the mattresses, blankets, clothing, books, etc. However, for the present, wood cannot be abandoned entirely. Top signal masts, flag poles, etc., will be made of steel, but there one cannot save weight. The fighting capacity of the ships is without doubt increased through these innovations, since the ship is less apt to burn, the effects of splinters are restricted, and considerable weight is saved, which is available for ordnance and armor."

It may also be mentioned that in German ships of war the protective under-water deck is never cut through either for ventilation or coaling purposes.

#### RECENTLY PATENTED INVENTIONS.

##### Engineering.

**STOP MOTION FOR GOVERNORS.**—George F. Boos, St. Mary's, Ohio. In centrifugal governors for engines and other machines, the stop motion, according to this invention, is arranged to at once shut off the motive agent in case the governor driving belt slips off, breaks, or becomes unserviceable. A cam mounted to turn is controlled by an arm carrying an idler pulley for the belt, and a spring-pressed lever held in engagement at one side of its fulcrum with the cam has connection with the valve stem at the other side of the fulcrum. In case of accident the downward swinging of the arm is very sudden, causing an immediate closing of the valve.

##### Railway Appliances.

**CAR FENDER.**—John Landau, Jr., Brooklyn, N. Y. To prevent people being run over or injured by street cars this inventor has devised a fender which is sufficiently yielding, when one is caught by it and received into its basket, to prevent rebound of the body, or its being thrown out, before the car is brought to a standstill. The improvement comprises a spring-pressed lever frame fulcrumed on brackets attached to the sides of the car platform, the car having such brackets at each end, and removably hung on this frame is a basket frame, which may be conveniently moved from one end of the car to the other, only one basket being used.

**SWITCH OPERATING MECHANISM.**—Charles E. Harris, Ellwood City, Pa. A switch controlling apparatus which may be operated from the car is provided by this invention, which comprises essentially a toggle joint mechanism connected to the cross bar which throws the movable portions of the track, the operating mechanism consisting of crank shafts extending across the track and operated upon by pivoted levers which extend lengthwise of the rails, the lever being depressed by wheels mounted on the car axle, the arrangement being such that they may be shifted laterally to engage the proper lever or to clear all the levers.

##### Electrical.

**TROLLEY.**—Frank W. Canalese, Portland, Me. The grooved wheel which takes the current from the trolley wire, according to this invention, is arranged to turn in a plane at right angles to the plane of rotation of the wheel, to accommodate itself to the wire when the trend of the latter is different from that of the railroad track. Combined with a trolley pole and supporting frame having an annular top plate is a cap turning on the top plate and carrying standards in which the trolley wheel is mounted, double acting springs holding the wheel normally in a central position relative to the pole, while a fork pivoted to the pole is apertured to receive the pivot of the trolley wheel.

##### Bicycles, Etc.

**REAR ADJUSTING FORK.**—John J. Naregang, Leesport, Pa. Instead of the ordinary coupling at the rear apex of the diamond shaped trussed frame, whereby the rear axle is inserted or removed in an open slot, and may be adjusted to tighten or loosen the chain by means of a set screw, this improvement provides a novel construction by which the removal of the axle and its readjustment, without breaking or opening the chain, is more conveniently effected. The axial pin, having a screw-threaded end, is arranged in a slotted frame plate, and a screw-threaded cone bearing fits on the axial pin, on the end of which is a clamping nut, while an adjusting screw having a forked end loosely embraces the axial pin.

**BICYCLE SADDLE.**—Charles H. Young, New York City. This invention covers a novel construction of the spring frame of the saddle, designed to retain the saddle in its normal form, and the shape of the saddle is designed to conform to the parts which contact with it in such a way as to cause the surfaces which should naturally bear the weight of a rider to be supported, while other parts liable to injury are relieved from pressure, the saddle having the form required by nature for easy and safe riding.

**BICYCLE REST.**—Eugene Church, Tacoma, Washington. This is a device to facilitate cleaning a bicycle, holding it upturned and reversed, in such way that every part may be readily reached, or the frame or parts of the machine may be conveniently repaired. It has four legs, which fold closely together to take up but little room when not in use, and a head block in which is a rest to engage the frame of the bicycle just above the crank hanger, two of the legs being then attached to the handle bars by cords, while the two other legs are similarly secured to the center brace at each side of the saddle, the necessary cords being permanently attached to the legs.

**TIRE.**—Jacob A. Lewis and William G. Spiegel, New York City. This is a pneumatic tire made in sections, each of which is adapted to be independently inflated, means being provided for holding the several sections firmly on the rim of the wheel and in engagement with each other. The preferred manner of joining the sections together is by means of a stud at one end fitting into a corresponding depression in the end of an abutting section, and it is also designed that the tread surface shall be slightly stepped, one section projecting slightly beyond the abutting end of an adjacent section.

**SPEED INDICATOR AND CYCLOMETER.**—Willis H. Ostrander, Boston, Mass. This combination device for indicating the speed and at the same time registering the distance covered is applicable not only to a bicycle, but may be used on a wagon, a steam engine, or a vessel. It has a centrifugal-operating governor adapted to throw an indicator hand a distance over the dial corresponding to the speed of travel. Its casing is divided

by a horizontal partition into a lower and upper chamber, the upper wall of the latter having a dial graduated to indicate the rate of speed, and also having openings through which figures on distance-indicating wheels may be seen.

##### Mechanical.

**WRENCH.**—Harry S. Noble and Charley M. Tussing, St. Mary's, O. This is a tool having a fixed and a sliding jaw, and means for holding the latter at any adjustment within its range of movement. The shank of the tool has a series of broken threads, at one side of which runs a longitudinal rib, while a thimble revolvably connected with the sliding jaw turns on the shank, the thimble having broken internal threads co-acting with the threads on the shank, the threads of the thimble being capable of moving through the space between the ends of the threads on the shank when not engaging such threads.

**STOCK AND DIE.**—George G. Doyle, Ogden, Utah. This is a tool more especially designed for the use of plumbers and other mechanics, and is arranged to permit of using different sized dies on the same stock, and having the dies of each set always set to cut the threads accurately, and so that no iron chips can get under the dies, so that they will not track or follow each other. The centrally apertured die plate adapted for attachment to the stock has slideways ranging toward the center of the plate at the aperture, the dies being mounted to move on the slideways, while adjusting devices carried by the plate engage the dies.

**MECHANICAL MOVEMENT.**—Sidney M., James T., and John A. Polson, Ladde, Mo. These inventors provide a simple mechanism designed for use in well drilling and other machinery, permitting a long drop of the working tool and requiring but a comparatively small amount of power for again lifting the tool. At one side of the center of the face of a continuously rotating crankhead is pivoted a rope-carrying arm, and a stop is fixed to the crankhead face at or near the opposite side, the stop being adapted to engage the free end of the arm once in each revolution and carry it around until it passes over its pivotal center and drops forward, producing an alternate lift and drop motion while the crankhead is being rotated continuously in one direction.

##### Agricultural.

**GREENHOUSE.**—William H. Witte, Baltimore, Md. To enable the valuable space of the walks to be utilized for benches carrying plants, etc., the greenhouse, according to this invention, is provided with rails extending transversely of the greenhouse walk, and a wheeled framework carrying a bench is adapted to travel on the rails, means being provided for raising and lowering the bench on the framework. Two stationary benches are also held at different heights, there being a walk between them, while a frame is capable of moving

transversely out from beneath the higher stationary bench to occupy the walk.

##### Miscellaneous.

**TYPE SETTING AND LINE CASTING MACHINE.**—Charles J. Botz, Sedalia, Mo. Pivoted type bars, each carrying at one end a matrix, according to this invention, are adapted to run on guides, to be readily arranged in any desired succession, and then clamped in form for the matrices to produce a line, when a pivoted casting box is swung over to engage grooves at each side of the matrices, and the metal may be poured to cast a line. A novel form of distributor is also provided for returning the type bars to their original position, the entire apparatus being carried by a light framework.

**RANGE GAS GENERATOR.**—Miguel Velez, New York City. A gas plant especially adapted for generating wood gas has been devised by this inventor, and one which may also be used as a range in public and private buildings, the gas being generated from wood or other vegetable substance. In the range is a retort connected with a gasometer, a gas outlet pipe being connected to a movable dome, and a purifier and washing device being connected with the retort. The apparatus connected with an ordinary range is designed to feed from twenty to twenty-five burners, the gas being burned with a mantle and thus giving an incandescent light.

**STREET SWEEPER.**—Alvin Brown, Aurora, Ill. This sweeper as it moves along sweeps the dirt and refuse in its path up into a casing or receptacle from which it may be automatically dumped as required. Its rear wheels have rubber tires, that it may run noiselessly, and they serve as drivers for the brush drum arranged transversely within the enlarged rear portion of the casing, there being a gear and lever mechanism for throwing the wheels into and out of connection with the brush drum shaft. A series of narrow brush belts, arranged side by side, is employed in preference to a single broad belt, facilitating repair and substitution when requisite.

**WEIGHING AND DUMPING VEHICLE.**—George H. Fletcher, New York City. To provide a wagon or cart with means by which the purchaser of a commodity, such as coal, may, if desired, ascertain the correct weight of the quantity delivered, or whereby it may be weighed by the seller as it is placed in the vehicle is the object of this invention. Provision is made for weighing the load by a scale beam and weight or by a platform or spring scale, according to the desired construction, and simple means are provided by which the body may be raised and inclined to dump the load, either laterally or at the rear.

**DUMPING BOX OR BUCKET.**—Michael W. Peterson, Elliott, Ill. This improvement is especially designed to facilitate handling ear corn or grain in cribs,