

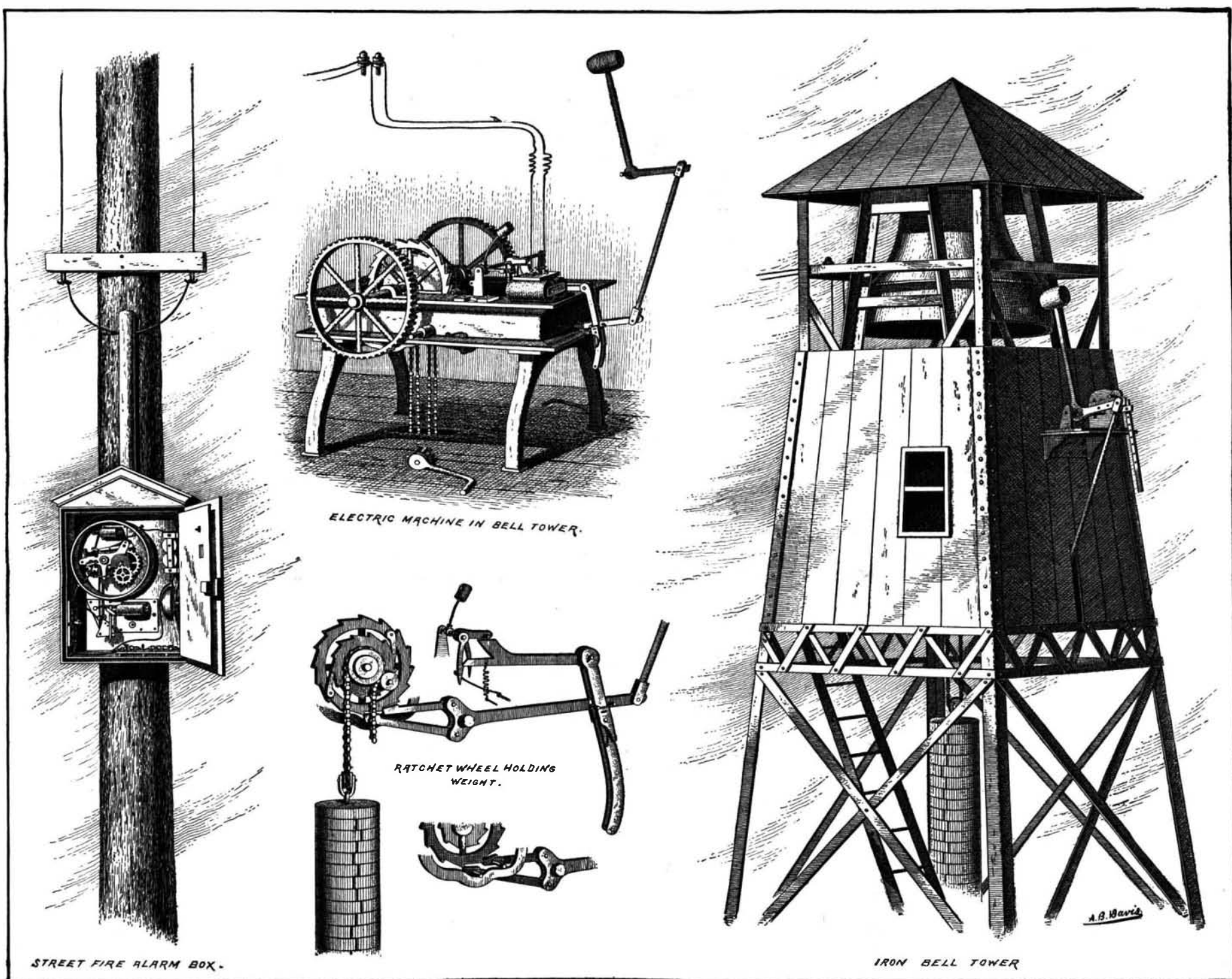
fitted with a water-tight joint into a frame, the construction of the latter varying with different forms of the table. The tables in their normal position are inclined, the combined sections representing essentially an inclined plane, while each table may be provided with a shaft or spindle for tilting it at will. A waste flume is held upon uprights above the table, and at the upper end of the table is a frame in which a beam is held to slide vertically, the extremities of the beam being connected by links with the crank arms of a rock shaft journaled near the base of the frame. At each side of the table is a support for a beam held to slide horizontally, motion being communicated thereto from the rock shaft, and from the center of this beam extends an arm carrying an agitating comb reciprocating over one or more of the upper sections of the table. These sections are made with a flat upper face, and above them is a fixed hopper, below which is a water

THE FIRE ALARM SYSTEM OF JERSEY CITY.

A feature has been introduced by the fire department of Jersey City into the fire alarm system of that city which distinguishes it from most of those with which we are familiar. It is a system that could be used with advantage, it would appear, in many of our towns where there is no paid force of firemen, but where the protection of property from fire depends upon volunteer fire service. The peculiarity of this system consists in ringing tower bells in different parts of the city by means of electric signals from alarm boxes located in conspicuous places in the public thoroughfares, similar in principle to those in use in this and other large cities. These alarm bells are rung automatically, in a manner that will be described later. The system is very ingenious and complete. There are four of these towers in Jersey City, from each of which every fire alarm is sounded, according to the number

drum is caused to rotate under a spring that presses on it. The circuit, including the magnet, is completed through this spring. A number of notches are cut in the periphery of the drum or disk. As it rotates, the spring drops down into these notches, and each time that it does so breaks the connection, thus opening the circuit. Each time that this occurs the bells in all the engine houses in the city ring, and the four bells in the towers ring the same alarm at a slower rate. The notches are cut differently for each box, so as to form by their combination and spacing a special signal.

When a box is rung, its "makes and breaks" are transmitted to the central electric station, where they actuate an automatic recorder and repeater. By one part or division of this apparatus the signal is recorded by holes punched in a strip of paper or "tape," and at the same time is repeated by relay action to all the engine houses. The same apparatus by its second



RINGING FIRE ALARM BY ELECTRICITY.

chute, whereby a current of water may be turned upon the face of the concentrating table at any time. To the upper end of the waste flume is securely fastened one extremity of a flexible pan or hopper, the other extremity of which is detachably attached to the vertically reciprocating beam. This hopper may be made of rubber, heavy canvas, or rawhide, and above it is a chute for supplying to the hopper such a current of water as may be desired. The pulp, gravel, ground earth, etc., to be operated upon, having been placed in this upper hopper, under the stream of water, is rolled backward and forward with the alternate rise and fall of the hopper caused by the vertically sliding beam, the slums, light gravel, etc., passing off through the waste flume at every upward motion, the concentrates settling in the center of the pan. When the charge has been sufficiently washed, the upper end of the hopper is released from its attachment and the contents dumped into the fixed hopper below, where they are further cleaned and concentrated in passing over the glass sections in the presence of water, the material being also agitated at the upper end of the table by the comb.

For further information relative to this invention address Messrs. Romans & Kidd, Deadwood, South Dakota.

of the box whence it has been sent. These tower bells are rung in connection with the work of the fire department. In addition to the men on contract service in the engine houses, there are seven men on "call" attached to each engine and truck company. These men sleep at their homes, and answer the calls from the four tower bells, reporting for duty in obedience to their ringing. They receive a reduced salary of \$75 per annum for their services.

The electric service also rings the gongs in all the engine houses of the city.

In the central electric station there are installed 340 cells, most of which are of the gravity type. These cells do all the work of the entire system. Twenty-five of the cells are devoted to ringing the bells in the tower. The others are divided up; some are for local work within the station; the majority are placed on nine circuits, including the engine house circuits and the alarm box circuits. These boxes are placed in various parts of the city upon the telegraph poles carrying the fire department wires.

The interior of a box is shown in the cut. The wires enter it and connect with a magnet whose armature is kept attracted as the circuit is kept normally closed. If a fire occurs, the box is opened and a handle is pulled down. This starts the mechanism. A metal

division regulates the current to the four bell towers. Like the other circuits, the bell tower circuit is kept closed. If broken once, the bell rings once. The repeater therefore has to open the circuit once for each ring corresponding to the box number, and has also to space these properly to express the two digits that generally compose this number, such as two—four, three—six, etc. It has also to perform one additional function. The signals are sent out to the engine houses at the rate of a beat a second. This speed would not answer for the large bells, and the repeater sends out the signal at a slower rate for them. The tape is fed at speed regulated for one break per second, through that part of the apparatus which perforates it and sends out the signals to the engine houses. The engine house gongs are practically in synchronism with the alarm box actuating this part of the apparatus. Next the paper is fed through the part of the mechanism which operates the tower bells. The tape passes through this at one-half the former speed. A flat spring presses upon it and keeps the circuit closed as the paper holds it up in contact with a terminal. When a hole comes beneath it, its point drops into the hole and the circuit is broken for an instant and the bells ring once. This is repeated for each hole. Thus an autographic repetition at reduced speed of the en-

gine house signals is given. It is much as if one should turn an inscribed phonograph cylinder at half speed.

The bells are rung by mechanism actuated by a descending weight of 3,000 lb. When on closed circuit, the armature is held attracted by the magnet and the motion is arrested. When the circuit is opened, the armature falls back from the magnet. This releases the detent, and the ratchet wheel holding the weight begins to revolve. Referring to the cut, it will be seen that there are two pawls which engage with the teeth of this ratchet wheel. Each pawl is held to its position in engagement with the teeth of the wheel, or is released therefrom, by the action of a pin projecting at right angles from the pawl in question, and projecting through a slot of peculiar outline. This is shown in the cut directly below the drawing of the ratchet wheel and weight. This slot and pin mechanism is so arranged that only one of the pawls at a time engages with the teeth. When on closed circuit, which is the normal position, the upper pawl only is in engagement. When the detent is released, the upper pawl is first acted on by the revolving wheel. This action draws the hammer back from the bell. As the pin rides through the slot, the pawl escapes from the teeth and the other one engages and the hammer is driven against the bell. The bell-ringing lever rises and is again caught by the detent just as the pawls change places, and the motion is arrested with the upper pawl engaged until the next break in the current occurs.

The system includes 60 miles of No. 9 iron telegraph wire, 87 miles of insulated No. 12 copper wire, carried by 845 poles. It rings 18 engine house gongs, 6 small gongs for engineers, and the 4 tower bells. There are 94 alarm boxes. The gongs and boxes are placed on 9 circuits, and a tenth circuit comprises the bell-tower connections. Our thanks are due to courtesies received from Mr. John Spencer, superintendent of telegraphs for the department.

The distinctive peculiarity of the system shown is the ringing of tower bells from an electric system. It gives an excellent suggestion to towns having volunteer fire engine companies. In such towns a central tower with a good number of electric alarm boxes and connections would do most excellent service in accurately designating and ringing out an alarm of fire to arouse the members and tell them where their services were wanted.

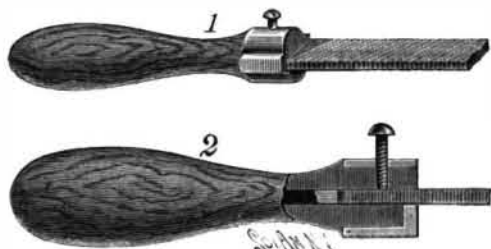
AN IMPROVED DENTAL INSTRUMENT.

The illustration represents an improvement in that class of dental instruments known as dental elevators or stump extractors. The instrument is made in "rights" and "lefts," so that the convex bearing surface may always be next the gum of the patient, to avoid bruising or lacerating the flesh, or next the jaw bone or an adjoining tooth. The instruments are all made with long shanks, to be easily operated in the mouth of a patient, and are adapted to be slipped into a handle when they are to be used. This invention has been patented by Mr. Daniel Siddall, of The Dalles, Oregon.



AN IMPROVED TOOL HOLDER.

The illustration represents, in section and perspective, a tool holder adapted especially to receive the burnishing irons of shoemakers, and also files with or without tangs or shanks, and files having their tangs or shanks broken off. It has been patented by Messrs. William MacMurtrie and Edwin H. Homsher, of No.



MACMURTRIE & HOMSHER'S TOOL HOLDER.

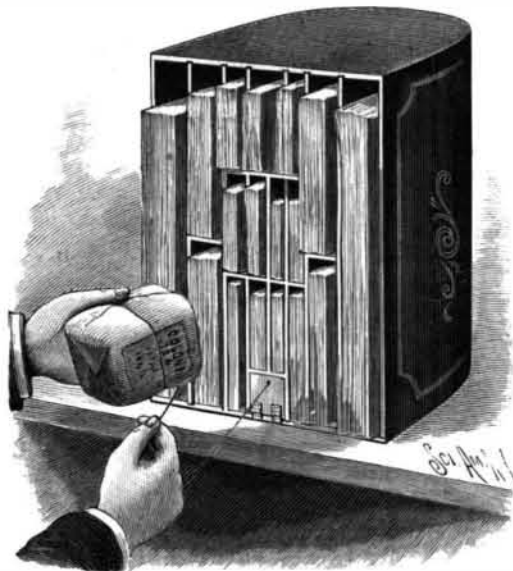
1832 East Somerset Street, Philadelphia, Pa. A shoulder and slot are produced in the forward end of the handle, the wood extending farther at one side of the slot than the other, as shown in Fig. 2. The ferrule has side projections, adapted to be located opposite the sides of the central slot, and a set screw extends through one side of the ferrule, whereby a file with a broken tang may be rigidly held in the handle.

Photographic Halos.

The authors succeed in avoiding these halos by covering the back of the plate with a layer of normal collodion holding in solution a small quantity of chrysoidine. This varnish having an index of refraction little different from that of glass, completely suppresses the halos.—Paul Henry and Prosper Henry.

AN IMPROVED HOLDER FOR PAPER BAGS.

A light and simple construction, occupying but small counter or shelf space, for holding paper bags and sheets of paper for wrapping packages, and the cord or twine used therewith, is shown in the illustration, and has been patented by Mr. William B. Shafer, of Somerset, Pa. The casing is semicircular, and it is



SHAHER'S HOLDER FOR PAPER BAGS.

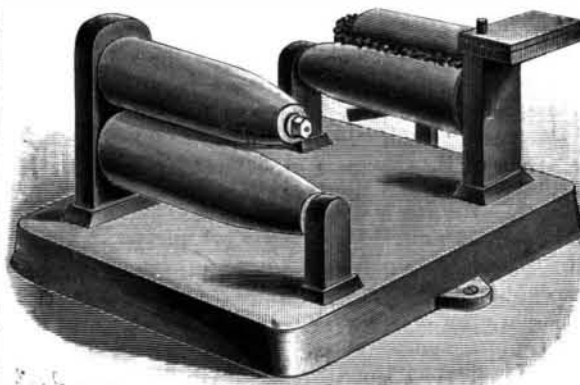
internally divided by vertical partitions of the same form, these curved compartments being divided by any desired number of horizontal partitions. The outer compartment is preferably left open for the reception of large sizes of paper, and centrally in front, at the bottom of the case, is a small twine-holding compartment. This holder may be made of paper or mill-board, to be very light and quite inexpensive.

Visit of the Iron and Steel Institute to the United States.

Next fall the Iron and Steel Institute of Great Britain proposes to visit America. This representative body will probably send over 400 of its members. They will be joined by more than 100 members of the corresponding German society, the Verein Deutscher Eisenhüttenleute. They will on arrival be taken in charge by the American engineers, and everything that can be done to make their visit a pleasant and memorable one may be anticipated. It is proposed to take the visitors all over the United States and let them see for themselves the giant strides which America is taking in the iron industry. When the visit occurs, much interest will be felt in the reception and proceedings. At present nothing beyond the announcement of the trip is in order.

AN ENVELOPE MOISTENER AND SEALER.

The accompanying illustration represents a device for moistening envelopes, pressing the flap down, and sealing the envelope. It has been patented by Mr. James Maret, of Mount Vernon, Ky. In standards, upon a suitable base, is journaled a tapering roller, and on one of the standards is held a water reservoir, with which is connected a holder supporting a thin, flat sponge, held close to the roller. The reservoir has an aperture in the corner adjoining the sponge holder, the amount of water passing to the sponge being governed by a plug or screw. At one side of the base is a standard, which supports a guide under the sponge holder. In other standards on the same base is journaled a tapering roller, the bearings of which are supported by spiral springs, an upper roller being journaled on a rod extending from one of the standards in such a way that these rollers are held in yielding contact with each other. The gummed surface on the envelope flap is first moistened by passing it between the guide and the sponge holder, drawing it forward over the roller beneath, when the flap is turned down and the envelope passed between the spring-pressed rollers, thus effectually sealing it. A corner of the envelope may also be conveniently moistened to receive the stamp by means of this device.



MARET'S ENVELOPE MOISTENER AND SEALER.

Increase the Patent Office Facilities.

Three millions of dollars is the sum which it is proposed to appropriate for the building of a new Patent Office, or for making some provision for removing the other bureaus of the Interior Department from their present quarters and giving the whole of the building to the Patent Office.

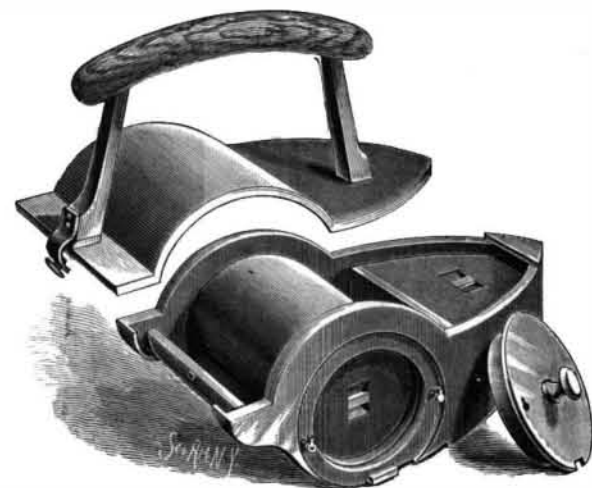
Representative Butterworth, chairman of the committee on patents and ex-commissioner, states, in a report to the House, that a suitable building can be constructed by private contractors in one year, but that it would probably take the government from five to ten years to do it, and it would cost twice as much. He declares, with much emphasis, that there is neither justification nor excuse for continuing the office in the insufficient, inconvenient, and unhealthy quarters which it has so long occupied, and which are rapidly becoming more unfit for the purpose. He believes that Congress has dealt with this important bureau in palpable disregard of the rights of the citizens having business to transact before it, and who pay the whole expense of its maintenance.

The *Electric Review* repeats what has so often been said before about the necessity for additional room for the Patent Office, but which Congress seems reluctant to understand, or rather has heretofore been indifferent about remedying.

The editor says: "Inventors not only pay the cost of their own labor and researches in perfecting their inventions, but they also pay the cost of the examination by the government to determine whether the invention is new and useful, and therefore patentable, and, if patentable, they pay the expense of issuing the patent. So that the Patent Office has to its credit \$3,631,670.32 over and above all expenses, which the inventors of the country have paid for the support of the bureau, and this surplus should be used in providing proper facilities for the rapidly increasing work."

AN IMPROVED SAD IRON.

This sad iron, patented by Mr. Albert Carman, has a hollow body divided by a transverse partition forming a front chamber, closed at the bottom, constituting a hollow pressing block, designed to contain a loose heating solid metal core, which may be readily placed in or removed therefrom. In the rear of the front chamber is a space adapted to receive a hollow pressing roller, containing a removable heating metal core, readily placed opposite side lids covering the space



CARMAN'S SAD IRON.

occupied by this roller. The top of the body of the iron has a removable cover, on which are stanchions that carry the handle, the cover being fitted to its place by entering it within upper raised portions of the side walls and sliding it forward under a cap on the body of the iron, the rear end of the cover being fastened in place by a spring catch. For further information relative to this invention, address Messrs. Carman & Martin, No. 416 Main Street, Winnipeg, Manitoba, Canada.

Japanese Anemones.

For entrance steps, porch or piazza decoration few plants excel well grown specimens of *Anemone Japonica*. A correspondent from Wellesley, Mass., in *Garden and Forest*, says: Ours are grown in twelve inch pots, started in a frame during March, which advances them sufficiently in this latitude to bloom toward the end of September. Further south this would be unnecessary. We place five to six strong crowns in each pot, in good loam. As soon as the flower stems appear in August, liquid manure is given. Abundance of water is essential throughout the season; just sufficient staking is done to get good specimens. The best varieties are the white Honrine Joubert and the hybrid pink.

Bridge Moved by an Earthquake.

A peculiar accident recently occurred on the Southern Pacific road. An earthquake moved the iron truss railroad bridge over the Pajaro River, on the coast division, about one foot and prevented the passage of trains. The bridge, however, remained on its stone piers and was safe after the rails were moved in line.