GROWING ORCHIDS.

The orchids are among the most recent popular claimants for the attention of the florist and the amateur, and there are some varieties which can be raised with very little trouble and expense, as a large proportion of the entire class require but a moderate degree of heat. The species are very numerous, and are found all over the world, this country being, however, but sparingly represented among them. The best known of the American kinds is probably the showy orchid (*orchis spectabilis*, of Linnæus); this is found from New England to Kentucky, and beautifies the wooded hills in the month of May. The large, round-leaved orchid (*platanthera orbiculata*) spreads its foliage on the ground, and the white orchis (*p. dilatata*) bears a wand-like spike of whitish flowers. Both these kinds are common in our Northern States. Perhaps, however, the most beautiful of our native sorts is the great purple orchis (*p. peramœna*, Gray), with its large, showy flowers. It grows freely in moist spots in the West and South.

As a rule, all orchids require plenty of moisture, and the beautiful English specimen shown in our engraving is elevated in a bed surrounded by spars of wood, serving to keep the roots well supplied with air, and to surround them in a water-bearing mass of moss or other vehicle.

New Form of Concrete Foundations.

At Glasgow harbor, the foundations for a 60 tun crane have been put down on a new principle by Mr. Deas, engineer to the Glasgow Harbor and Clyde Navigation.

The quay wall itself is carried on triple groups of 12 feet cylinders. The crane seat rests on twelve concrete cylinders, 2 feet 4 inches thick and 12 feet external diameter, in three rows of four each. The four front cylinders were made in pairs, and the middle and the back rows singly, the last two rows being joined together by tongues of brickwork. The cylinders were made in wooden frames, in rings about 30 inches deep. They are composed of a mixture of five of gravel to one of Portland cement, and were ready to lift and set in position after being made about three weeks.

The cylinders sit each on a cast iron shoe, on which, after being set in the trench, brickwork in cement was built to a hight of 5 feet. On the top of this the concrete rings were placed, and jointed together with strong Portland cement mortar. The bottom of the trench in which the shoes were placed close together was about 3 feet above low water level. After the building of the cylinders on the shoes was completed, they were sunk, by means of Milroy's patent excavators, until the bottom of the shoes reached the depth of 32 feet below low water level, or about 52 feet below quay level, about 100 tuns of cast iron rings, of the same shape as the concrete rings, being required to force each cylinder down. The cylinders were then cleaned out by the excavators to the level of the bottoms of the shoes, and filled with Portland cement concrete, the lower 9 feet of the front cylinders being composed of five of gravel to one of cement, all the other concrete used in filling being nine to one. The diamond spaces between the cylinders were also cleaned out to the same level, and filled to the top of their cylinders with concrete, five to one.

THE SOLANUM CRINITUM.

This is one of the handsomest of all the plants known as sub-tropical, when grown in warm sheltered spots. According to the *Revue Horticole*, this plant was introduced to Paris gardens in the year 1862, and is a native of Guiana. It is, in addition to its fine size and dignified port, a plant of remarkable beauty, owing to the texture of its leaves, which are covered with a deep rich velvet of tender green color, with violet veinings set with spines. So very remarkable a plant deserves to be cultivated as an indoor plant where the climate will not permit of its being grown out of doors.

SOLANUM CRINITUM.

Panoramic Photographs.

M. J. F. Plucker, of the Belgian Photographic Association, contributes to the *Bulletin* an ingenious method of producing panoramic prints from two or more negatives. The negative must be taken so as to include, at the edges where the junction is to be made, a portion of the subject in common This portion is printed from one of the negatives upon a slip of paper, which is divided in the center with a penknife. The two halves are then attached to the negatives in such a manner as to exactly cover the portion it is intended to "stop out" of each, a piece of opaque paper, the size of the negatives used, being also gummed on for the purpose of protecting the sensitive paper, which is not covered by the negative. The first negative is placed in a printing frame large enough to hold the number of negatives intended to be combined, and, after printing, the extremities of the line of junction are carefully marked with a pin point. Negative No. 2 is then introduced and brought into register with the pin holes. This may be done either by holding the frame up to the light, or by resting it on the edge of a table, a lamp being placed on the floor. Having secured the register, proceed to print in the usual way, repeating the operation for each different negative.

Magnetization of Steel.

The magnetic strata are limited to a certain thickness, which they can never exceed. This limit varies in different steels. It is very great in those which are soft, and diminishes as the proportion of carbon augments and as the temper is harder. For certain bars which the author has studied it is $=0m\,4$; but he has specimens where it is below 1-10 m.m. The latter only receive what might be called a superficial magnetic coating, the thickness of which it is not possible to augment by increasing the intensity of the current. But if the depth of the magnetization diminishes along with the magnetic conductibility, the intensity of the magnetism increases. It follows that the quantity of magnetism is subject to two causes of inverse variation—the depth which increases, and the intensity which lessens, as the conductivity increases.—*M. J. Jamin.*

Everlasting Perdition.

A reward of two hundred and fifty dollars is offered in London, for the best essay of moderate phamphlet size, advocating an address by the House of Commons to the Queen, in favor of the revision of the services of the State Church, so as to exclude the threat of Everlasting Perdition against those of Her Majesty's subjects who do not believe in that doctrine. Essays are to be sent in before May 1st of the present year addressed to Rev. R. Spears, 37 Norfolk street, Strand London.

Uses and Properties of Salicylic Acid.

Salicylic acid is prepared from the oil of wintergreen, the latter obtained from the *gualtheria procumbens*, a trailing plant common all over this country and widely known as the wintergreen, tea berry, partridge berry, and deer berry, by boiling the oil for a few minutes with a solution of caustic potash: in this operation wood spirit is liberated, and on the addition of an acid salicylic acid is precipitated. Thus obtained, the cost of the substance has been high. Although its existence has been familiar to chemists, through its little or no utilization, it, in common with a very large number of other organic compounds, has been but slightly known outside of the laboratories. At the present time, however, there is a prospect of the acid coming into wide general employment through the recent discovery, of M. Kolbe, Professor of Chemistry at the Leipsic University, that it can be fabricated from carbolic acid, which discovery has been already put in practice on a large scale by M. Van Heyden of Dresden.

M. Kolbe has found that, while salicylic acid can be produced from carbolic acid, it, on decomposition by heat, regenerates the latter, and, further, it partakes, in common with carbolic acid, of the power of killing the inferior organisms which determine the phenomena of fermentation and of putrefaction.

Salicylic acid is in fact a powerful antiseptic, and, from its harmlessness and freedom frcm odor and taste, appears to be more valuable, in a considerable degree, than carbolic acid. Its properties are well shown in the following brief summary of M. Kolbe's experiments: Beer yeast, which, as is well known, determines the alcoholic fermentation of sugar, is totally inert on a solution of glucose to which one one-thousandth part of salicylic acid has been added. Ground mustard, when treated with tepid water, yields a strong piquant odor of mustard, but becomes completely odorless if a small portion of the acid be previously added. The acid also hinders emulsin, or the ferment of sweet almonds, from acting on the amygdalin and transforming it into essence of bitter almonds.

A very small quantity of salicylic acid retards considerably the spontaneous coagulation of milk. A quart of beer containing 15·4 grains of the acid and exposed to the air does not become sour, nor does the least vestige of the cryptogamic vegetation peculiar to spoiled beer show itself. Eggs plunged for one hour in a solution of the acid, and in no manner treated otherwise, were found perfectly fresh after three months' exposure to the atmosphere. Meat powdered over with the substance is prevented from spoiling for weeks. To prepare for use, the meat is merely washed to disengage the acid, as the savor of the latter is very slight and by no means disagreeable. This is a remarkably valuable property, and one which will doubtless find profitable utilization in transporting beef from Texas to the Northern States, or from Australia and South America to Europe.

Dr. Thiersch, of Leipsic, has investigated the uses of salicylic acid as applied to surgical dressings. When placed upon cancerous sores and ulcers in a powdered state, it hinders the putrid odor and produces no inflammatory symptoms. The impregnation of tow dressings and of bandages with the substance is found to be attended with excellent results, though it is curious here to remark that the acid is absorbed and afterwards found in the urine. The application of the acid to treating contagious maladies, such as typhoid and cholera, has as yet not been made the subject of experiment; but now that the properties of the substance have brought it prominently before the scientific world, there is little doubt but that the most extended investigations into them will shortly follow. It is already in use in the surgical wards of Roosevelt Hospital in this city, as a dressing for wounds, ulcers, etc,, in the proportion of one drachm to sixty-two and a half fluid ounces of water.

Apparatine.

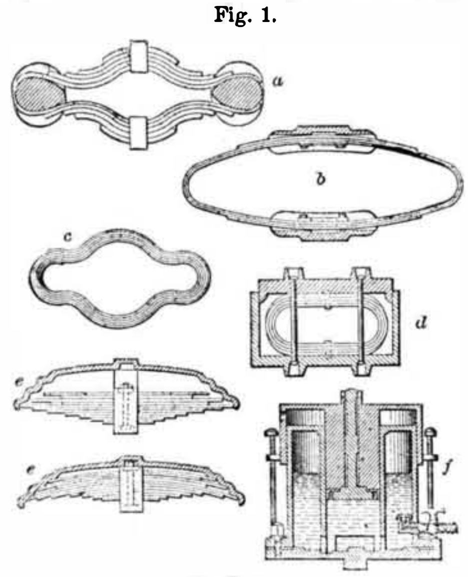
This is a new substance said to give excellent results when employed for preventing incrustation in boilers, besides being useful where gelatin and gelatin-like substances are required. It was discovered by Mr. H. Gerard. It is a colorless and transparent material obtained by treating starch, fecula, farina, and any other amylaceous substances with a caustic alkali. Hitherto it has been found to be best made with potato starch, treated with a ley of caustic potash or soda, the following being the most suitable proportions, and best method of preparing the apparatine: 15 parts potato starch are put into 76 parts water, and kept in a state of suspension by stirring, when 8 parts potash or soda ley at 26° Baumé are to be added, and the whole thoroughly mixed. In a few seconds the mixture suddenly clears, and forms a thick jelly, which is then beaten up vigorously, and the longer the operation is continued the better the quality of the apparatine. It is in this state a colorless, transparent substance, slightly alkaline to the taste, but devoid of smell, and of a stringy, glue-like consistence. It exposed to the air it dries slowly, but without decomposing; and even when heated to dryness, although it thickens and swells, it continues as unchanged as when air dried. When dried in thin sheets it resembles horn, but is more flexible, and may be folded back upon itself without breaking. For sizing textile goods of all kinds, silks, woolens, cottons, etc., apparatine is said to be admirably adapted, imparting to them a smoothness which hitherto has been found unattainable. When once applied to the goods and become dry, apparatine appears to be virtually insoluble. as three or four washings in hot water have been found to exercise little or no effect upon it, so that it may be used for all purposes in which glue or gum is required. Diaphanous or coarsely woven fabrics, when dressed with apparatine, are rendered stiff and rigid, like a sheet of metal; and the new gum may be used as a thickening in calico printing. It will be understood that we have indicated only a few of the uses of this valuable substance, which, it will be seen, is comparatively cheap. It is necessary to keep it in airtight vessels to prevent it becoming dry, unless it is used up as soon as made, for although it does not dry very rapidly when in bulk, it is not easily rendered soluble when it has once become hard. To prevent incrustation in steam boilers, the apparatine may be placed in the boiler or be added to the feed water in the tank, but the best results have, we believe, been obtained by placing it in the boiler direct.

CAR AND CARRIAGE SPRINGS.

We continue below our series of extracts from Mr. Edward H. Knight's "Mechanical Dictionary,"* selecting for the present paper a variety of interesting engravings relating to the various types of springs in use upon railway cars and on ordinary vehicles.

Car springs may be classed as elliptical, pneumatic, torsional, rubber and steel, rubber, steel, and air, spiral, helical, circular plate (plane, corrugated, and segmental), square plate, and bow. In the engravings which follow, the parts and structures are so evident that only a short description of each will be given. In Fig. 1, *a* is a double elliptic spring, the bearing of the end leaves of which are so shaped that, as

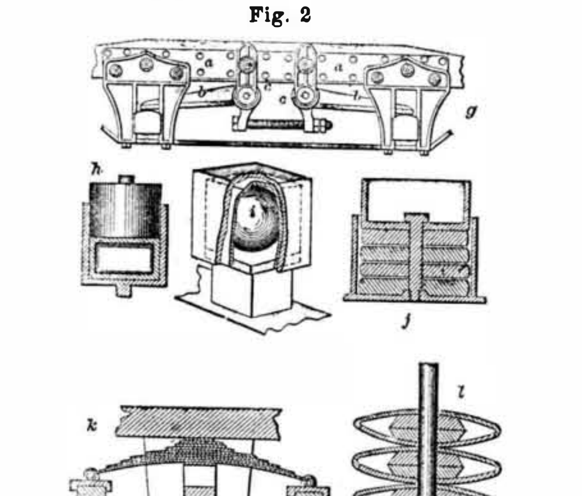
Fig. 1.



Car-Springs.

the spring bends beneath its load, additional leaves receive a bearing upon the ovoid bars. *b* is an elliptic spring, the principal leaves of which are made of a continuous plate wound around. Auxiliary plates, above and beneath, extend the area of bearing of the boxes. *c* represents a single plate wound around a mandrel. It is designed to be used with upper and lower bars, as at *b*, or in a box, as at *d*. *d* shows an elliptic spring in a box and a follower above, upon which the weight is imposed. Long bolts secure the follower. *e* is a series of plates which, when under others, assume the form, *e'*. The box above has a series of steps beneath adapted to

Fig. 2

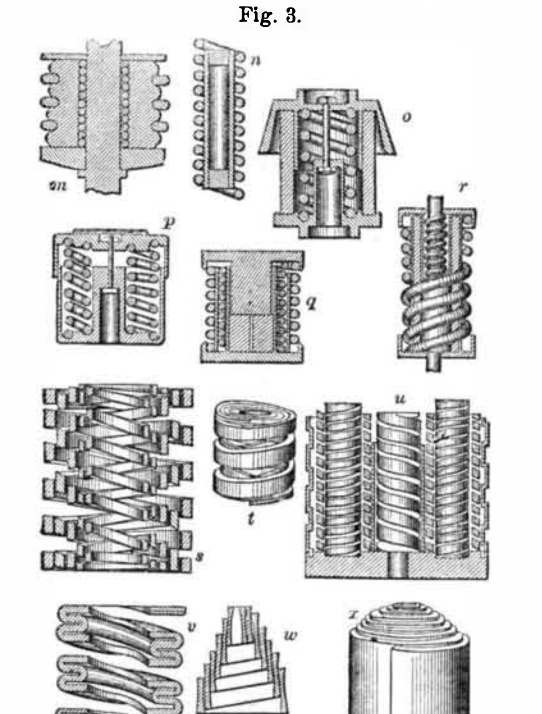


Car-Springs.

the lengths of the leaves of the springs, so that, as the weight increases, additional leaves obtain bearings in the box. A form of pneumatic spring is shown at *f*, in which the weight bears upon a box, the central plunger of which bears upon water, which transfers the pressure to a body of air imprisoned below.

In Fig. 2, *g* is a torsional spring. The weight of the truck comes on spring rods having arms, *b*. The torsional pressure is brought upon the rods, and by them transferred to the axle boxes. *h* is a pneumatic spring consisting simply of a rubber air cushion beneath the box. *i* is a hollow india rubber ball in a box with a polished interior. *j* represents a number of rubber disks in a box beneath a follower. *k* is a combination of steel elliptic springs with auxiliary rubber blocks at the ends. *l* has concavo-convex plates fitted upon a spindle with interposed vulcanized india rubber disks.

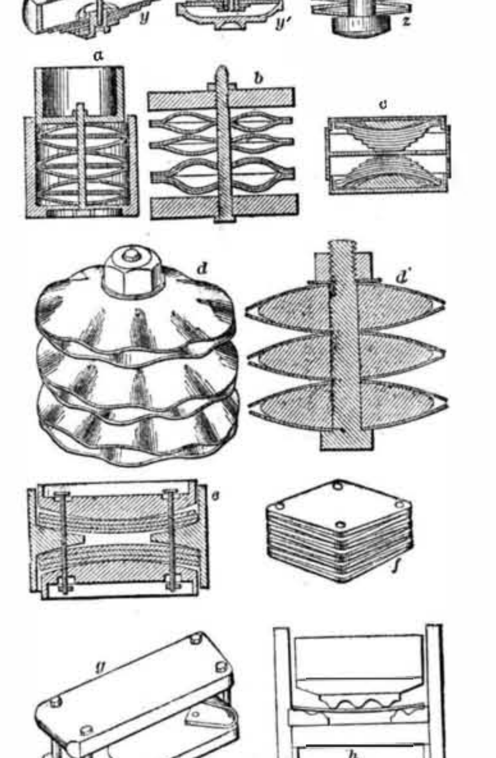
Fig. 3.



Car-Springs.

In Fig. 3 a cylinder of vulcanized rubber, with an interior coil to keep it from binding against the spindle, and an exterior spiral coil to keep it from spreading too far, is shown at *m*. In *n* air is inclosed in a rubber tube, which is enveloped in a steel spiral. *o* has an india rubber cylinder inclosing a spiral spring, and a bolt to limit the extent of the upward movement of the cover. The rubber expands into the flanged rim. *p* has a spiral steel spring contained in an annular case. *q* represents a pair of concentric spiral springs on the respective sides of a dividing cylinder. In *r* there is a combination of spiral and rubber springs, with telescopic tubes to form walls. *s* is a concentric arrangement of several spiral springs coiled in alternate directions. *t* shows a closer coil of the same general construction but of different proportions. In *u* each set has a pair of spirals, concentrically arranged, diversely coiled, and inclosed in a cylindrical sheath. *v* is a steel plate folded and then bent into a spiral form around a mandrel. *w* is a volute or helical spring, the inner fold of which, being projected in the line of its axis, is made to sustain the load. *x* is another helical spring shown in elevation.

Fig. 4.

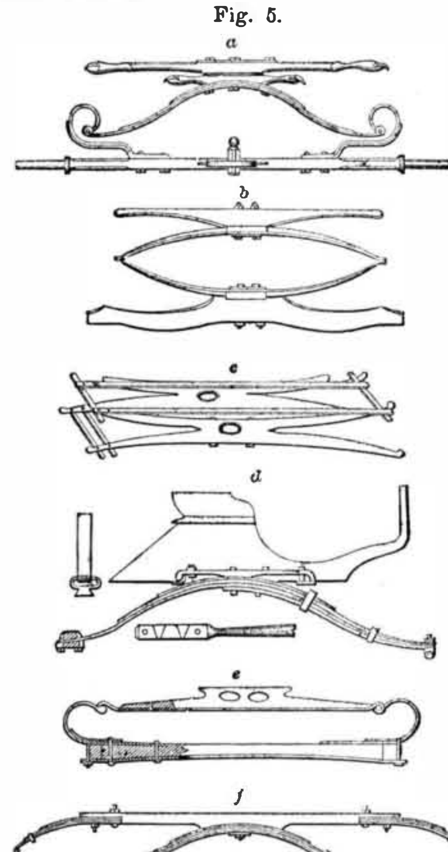


Car-Springs.

Fig. 4 represents a variety of springs mainly constructed of plates. *y* and *y'* are views of a set of circular disks of graduated diameters. In *y*, the spring is a pair of such series; in *y'*, two pairs of the same are allied. *z* has annular disks arranged in pairs and united by a rod. *a* has segmental plates alternating with flat plates in groups, the whole in a box under a follower. In *b* the spring is composed of a pile of circular plates, corrugated radially and arranged round a stem. In *c* the plates gradually increase in length upward and downward from a middle diaphragm. The bearings are on the ends of the longer and outer plates. Rubber springs are placed between the movable top and bottom plates of the case and the spring plates. *d* has several pairs of concavo-convex radially corrugated plates, and between the plates of a pair is a disk of vulcanized rubber. *d'* is a sectional view of the same. In *e*, a box has several metal plates compressed from opposite directions and shortened between bearings as they are bent. *f* has square plates curved diagonally and fastened together at the corners, thus forming alternate pairs, which bear upon each other at the corners and diagonally through the centers; the bearing points of the plates are changed by being lengthened and shortened when the spring vibrates. *g* has square, rhombic, oval, or circular plates bent bow-shaped and placed between bolsters. In *h* the plates are so disposed between the bearing surfaces that, when the weight increases, the load is transferred to points nearer the mid-length, so as to shorten the portion of spring involved in the support.

Numerous modifications and applications of the foregoing examples might be shown, but the above give a sufficiently clear idea of the various devices now in use. While on the subject of springs, however, it will be interesting to note a few of the appliances adapted to carriages, some of which will be found in Fig. 5.

Fig. 5.



Carriage-Springs

At *a* semi-elliptical springs are exhibited, which are hung upon the ends of C springs attached to the axles. In *b* the usual elliptical springs are between the bolster and axle. Elastic wooden springs at *c* connect the axles and also support the bed. At *d* semi-elliptical springs couple the axles. At *e* a bolster is hung upon C springs, and at *f* is shown a system of curved springs, with three points of connection to the bed and two to the axles.

* Publishers, J. B. Ford & Co., New York city.

Mr. S. R. Wells.

We notice with much regret the death of Mr. Samuel R. Wells, a well known phrenologist and publisher of this city. Mr. Wells was born in 1820, and was educated as a physician; but subsequently becoming deeply interested in phrenology, he devoted himself thereto, delivering lectures and writing many works on the subject, the principal of the latter entitled the "New Physiognomy." He was associated for some time with Messrs. O S. and L. N. Fowler. Later, however, he conducted his business alone, and with considerable success.

Mr. Wells was a man of many scientific attainments, a progressive thinker, and a firm advocate of temperance and a proper observance of the laws of health. Works on these topics, by various authors, were frequently issued by him, and the principles of the same strongly maintained in the *Phrenological Journal*, of which he was the publisher and founder. He died on April 13th, after an illness of ten days, and of an attack of pneumonia, followed by other diseases.

A VERY ingenious application of electro-metallurgy has recently been brought before the notice of the Society of Arts. It consists in the application of a coat of silver, by means of electro-deposition, on natural leaves and flowers. By this means very delicate ornaments are produced, since the precise form and texture of the natural leaf is preserved under the thin silver film.

RUBBING warts, night and morning, with a moistened piece of muriate of ammonia, is said to cause their disappearance without pain or a scar resulting.