

of sheets in succession under the stencil, about 500 copies or more in fac-simile may be taken, each copy being very clear and distinct.

The pen is seen in end view at Fig. 1, Fig. 2 being a side view. The current A enters the engine by the binding screw B, and thence passes by the wire B C into the coil A<sup>1</sup>, which altogether with B<sup>1</sup> forms an electro-magnet. On leaving A<sup>1</sup> it traverses the wire D E, and enters the coil B<sup>1</sup>, and on leaving the latter passes through F G H to the screw L, and thence to the platinum point K, and when the latter is in contact with the other platinum point M attached to the spring N M O, it returns by the binding screw P to the battery. Q R is a small flywheel revolving with as little friction as possible on the axis S T. This axis also works an eccentric at W, to which is attached a brass rod, and to the latter the needle, which on the revolution of the wheel works with a vertical motion in the tube X Y. Across the flywheel in the direction of its diameter, there is a slip of soft iron Q R, which plays the part of an armature to the electro-magnet A<sup>1</sup> B<sup>1</sup>. On the axis of the flywheel at Z there is a cam, which in certain positions of the wheel presses against the spring N M O, and so separates the platinum points M K, and at the same time interrupts the current. When the wheel has revolved half round, the cam no longer presses against the spring, and the current passes. This will be more readily seen from Fig. 2 in which the axis of the wheel passes through the centre of the cam Z in a direction perpendicular to the plane of the paper. In the figures the wires connecting the different parts are shown separated somewhat from the machine in order that their direction may be clearly seen, but in the instrument they are pressed close against the framework.

The tube in which the needle works can be screwed to a slight extent up or down so as to allow of the very small length of needle projecting beyond the end of the tube being regulated. A small stand is provided in which the pen can be placed when not in use. By turning the screw at L, the pressure which the cam exerts on the spring can be regulated. A zinc and carbon battery of two cells is used to produce the current, the fluids being dilute sulphuric acid in the glass cell and a solution of potassium bichromate in sulphuric acid in the porous cell. The battery is very conveniently arranged in an iron stand, provision being made for raising the elements out of the fluid when the pen is not in use. Altogether the arrangement is very ingenious and not less ingenious than practical.—*The Engineer.*

### FLORAL CULTURE.

**HELIOTROPUM.**—Nat. Ord. Boraginaceæ. *Linn.*—*Pentandria Monogynia*.—A well known genus of profuse flowering and delicious fragrant plants, splendid for bedding or ribboning, and for baskets or pot culture; seeds sown in Spring make fine plants for summer and autumn decoration; light rich soil. *Half-hardy perennials.*

**HUMEA.**—Nat. Ord. Compositæ. *Linn.*—*Polyadelphia Polygamia Æqualis*.—A remarkably handsome plant, invaluable for decorative purposes, whether in the hall, the conservatory, or dispersed in pots about the lawn, pleasure grounds, terraces, planted in the centres of beds or mixed borders; its majestic and graceful appearance renders it a most effective and striking object; in any position it stands unrivalled as a garden ornament. Besides, the leaves are remarkably fragrant when slightly rubbed. With proper care it may be grown 8 ft. high and 4 ft. in diameter; succeeds best in light, rich soil. *Half-hardy biennial.*

**HUMEA ELEGANS, red;** from New South Wales; 8 ft.

**HUMEA PURPUREA.**—The flowers of this splendid novelty are of a deeper purplish red, and the habit of the plant is dwarfer than the older sort. For the formation of groups in the flower garden it will prove a very valuable acquisition, and produce a most striking effect.

**IBERIS.**—Nat. Ord. Crucifere. *Linn.*—*Tetradinamia Siliculosa*.—Profuse blooming pretty little plants, especially adapted for rockeries, old stumps, or rustic baskets; they come into flower amongst the earliest Spring plants, and for a long time continue a dense mass of beauty. Succeed in any garden soil. *Hardy perennials.*

**IBERIS, SEMPERVIRENS, pure white;** from Candia; ½ ft.

**ICE PLANT.**—Nat. Ord. Mesembryanthemew. *Linn.*—*Icosandra Siliculosa*.—A pretty little trailing plant, much used for garnishing, the leaves of which are covered with crystalline globules, thus giving it the appearance of being coated with ice; very effective for rock-work, or mixing with other plants in the conservatory or flower garden. *Half-hardy annual.*

**ICE PLANT, (*Mesembryanthemum crystallium*)** from Greece, trailer.

**LOPHOSPERMUM,\*\*** Nat. Ord. Scrophulariacæ.—*Linn.* *Didynamia Angiosperma*.—An exceedingly beautiful and highly ornamental genus of climbers, with handsome, showy, foxglove like flowers; very effective for conservatory or garden decoration, and may be used with advantage for hanging baskets; light, rich soil. *Half-hardy annuals.*

**LOPHOSPERMUM SCANDENS, rosy purple,** very fine trellis plant; from Mexico.

**ERINTS,** deep blue, flowers in profusion, beautiful dwarf bedder; half-hardy annuals; ½ ft.

**LUPINUS.**—Nat. Ord. Leguminosæ. *Linn.*—*Monadelphica Decandria*.—A splendid genus of the most ornamental, beautiful and free flowering of garden plants, with long graceful spikes of bloom; colors rich and varied. Many of the varieties are of a stately, robust growth, which makes them exceedingly valuable for mixed flower and shrubbery borders, while the dwarf varieties make neat, trim bedding plants.

**CRUKSHANKII, blue, white and yellow;** from Peru; hardy annual; 3 ft.

### EXPERIMENTAL AMUSEMENTS.

**ANOTHER PROCESS.**—Drop sulphuric acid into a saturated solution of muriate of lime; in this case also an opaque mass is produced. Another process—Pour a saturated solution of caustic potass into a saturated solution of sulphate of magnesia (epsom salt), a nearly solid mass is again produced.

**CHEMICAL MIRACLE.**—If a saturated solution of muriate of lime be mixed with a saturated solution of carbonate of potass (both transparent liquids), the result is the formation of an opaque and almost solid mass. If a little nitric acid be added to the product, the solid mass will be changed to a transparent liquid.

**THE EXPLODING TAPER.**—If the light of a taper be blown out, and the taper be let down into a glass containing oxygen gas, while the snuff (which should be a thick one) remains red-hot, it rekindles instantly with an explosion. When the taper is relighted, it continues to burn with a rapidity and brilliancy of flame, and an evolution of light truly wonderful.

**THE CANDLE INVISIBLY EXTINGUISHED.**—Place a lighted candle in the bottom of a jar which has its open part uppermost (the jar being filled with atmospheric air); take then a jar filled with carbonic acid gas, and invert it over the jar in which the candle is placed; the effect is very striking; the invisible fluid descends like water, and extinguishes the flame. The whole, to spectators who have no idea of substance without sensible matter, having the appearance of magic.

**THE MOVABLE METALLIC TREE.**—Mix together about equal parts of saturated solutions of silver and mercury in nitric acid, diluted with a little distilled water, in this mixture suspend five or six drachms of pure mercury, contained in a piece of fine linen rag doubled. The metallic solutions will soon penetrate to the mercury inclosed in the cloth, and clusters of beautiful needle-shaped crystals will begin to be formed around it, and adhere to the nucleus of mercury. When the aборization ceases to increase, the bag loaded with beautiful crystals may be taken out of the vessel where it was formed, by means of the thread by which it is suspended, and hung under a glass jar, where it may be preserved as long as may be thought proper.

**TO TELL THE HOUR BY A SUSPENDED SHILLING.**—Sling a shilling at the end of a piece of thread by means of a sloop; then, resting the elbow on a table, hold the other end of the thread betwixt the fore finger and thumb, observing to let it pass across the ball of the thumb, and thus suspend the shilling into an empty goblet. The hand must be perfectly steady, and if it should be found difficult to keep it in an immovable posture, the attempt must be given up. However, supposing the shilling to be properly suspended, you will find that when it has recovered its equilibrium, it will, for a moment, remain stationary. It will then, of its own accord, and without the least agency from the person holding it, assume the action of a pendulum, vibrating from side to side of the glass, and after a few moments strike the hour nearest to the time of day or night. It is necessary to observe that the thread should lie over the pulse of the thumb, and this in some measure will account for the vibration of the shilling; but to the proper number its vibration ceases, it acquires a kind of rotatory motion, and at last becomes stationary as before.