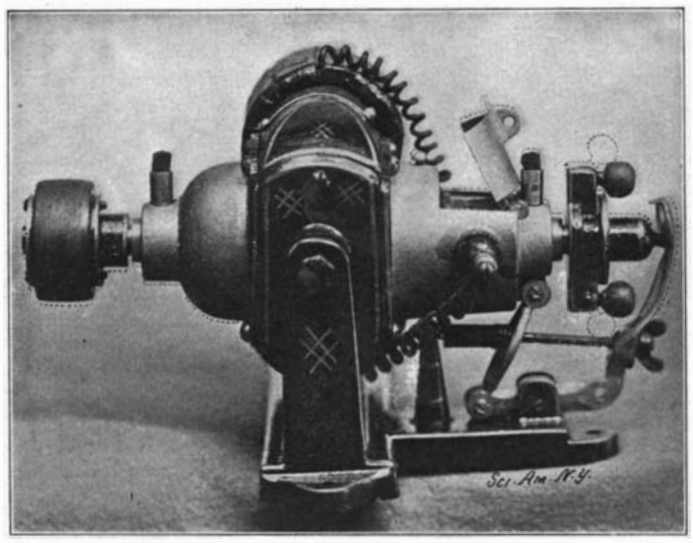
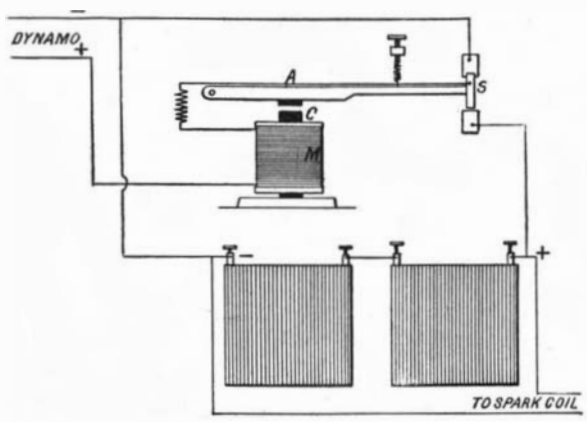
THE MOTSINGER IGNITION DYNAMO.

This is a strong, well-built, inclosed dynamo for ignition purposes. It was the first successful little machine of its kind to be used in America, and it has been so well thought of by the French firm of Panhard & Levassor that they have secured the patent rights in their country and are equipping their machines with it. A new type of governor has recently been brought out, and it is plainly shown in the illustration. The dynamo is set under the flywheel and its pulley is driven by friction with the latter. When it has reached the proper speed the governor balls are thrown out by centrifugal force and bell cranks attached to them push the sleeve on the end of the shaft against the curved spring attached to the lever pivoted on the dynamo base. This forces the outer end of the lever downward and raises the inner end, which is yoked to the governor sleeve, and which therefore tends to tip up this end of the machine, since the whole dynamo is pivoted on its transverse axis. The result is that the pulley moves away from the flywheel, and the whole machine assumes the position shown by the dotted lines until it drops back to speed. By employing this governing arrangement, it is possible to start the engine with ease when turning it by hand, and yet not damage the dynamo from excessive speed while the engine is running. The speed of the latter can be varied also without affecting the spark produced. The door in the casing allows of examination of the brushes, and the dynamo can be made to operate over the flywheel by changing the yoke to the hole near the outer end of the lever on the base.



THE MOTSINGER IGNITION DYNAMO.

The diagram shows an automatic switch arrangement for employing the dynamo in connection with two cells of storage battery. The storage battery furnishes the electricity for the spark and thus allows one to start the engine when turning it over slowly. As soon as the engine starts and the dynamo begins to generate, current from the latter will pass through the electro-magnet, *M*, and cause the core, *C*, to attract the armature, *A*, thus throwing the switch arm, *S*, on the lower contact, which is connected to the + pole of the battery. The dynamo current will then pass through the battery and back to the — pole of the dynamo. A great advantage of this arrangement is that the battery is always kept charged and so can be called upon to supply current for testing the wiring, or for operating the spark should the dynamo get out of order. Two small 10 or 15 ampere-hour cells are all that are necessary.



AUTOMATIC SWITCH FOR CHARGING STORAGE BATTERIES.

THE COMPUTING TRIANGLE.

BY B. M. DES JARDINS.

This instrument was designed to solve the problem of justifying type. It is practically adapted to automatic machine computation, on account of the equal distances of its graduations making it easily operated by the simple step-by-step motion. Its mathematical possibilities are large, as it possesses all of the qualities of the triangle for purposes of computing problems.

Its capacity for performing examples in addition and subtraction would be better shown by other forms of construction; the present construction, however, illustrates the underlying principle employed for performing examples. This construction is peculiarly adapted for adding and subtracting proportional amounts.

For simple addition or subtraction use the eccentric controlling the movable caliper jaw, displacing it by the addition or subtraction of the required amounts, one after the other.

For proportional addition or subtraction the successive amounts may be added or subtracted by means of the scale and eccentric controlling the angle, the amount of the proportion being controlled by the position of the stop along the lower scale. If it is required to vary the proportion while the process of addition or subtraction is going on, the variation is made on the lower scale either direct or by means of its eccentric.

In machine subtraction among others it performs such examples as would be necessary to reduce the end of a rod a given number of steps. Set the lower jaw, on its scale, a distance equal to the smaller size, then caliper the rod with the upper jaw, and when in this position set the angle in accordance with the number of steps wanted; set the stop on the lower scale till the parts are tight, then set the angle successively at the various figures or positions of its scale proportional to the steps wanted, and each position will locate the jaws at the successive positions required to caliper the metal as it is turned down.

Examples in division may be performed in either positive or negative quantities. The pivotal point of the angle represents 0, the right or upper arm is used for positive quantities, the left or lower arm for negative quantities.

The lower caliper jaw is adjustable for two purposes; it is necessarily set on the lower scale when the upper jaw is used in gaging negative quantities, and it is always set on the lower scale to designate the part of the substance upon which no example is performed. For simple examples in division the dividend, or amount to be divided, is designated by the position of the upper caliper jaw, which is adjusted according to the number and fraction required by means of its scale and segment. The amount of the division is then designated by the position of the angle by means of its scale and segment. Having located these two elements, the quotient is located by the position of the stop block against the angle and the amount is designated by means of its scale, and the remainder is then determined by the position of its segment. By means of this instrument, fractions of any nature may be divided with the same ease as simple numbers. The segments in each case readily locate the intermediate positions of the instrument. For multiplication the stop is located according to the amount to be multiplied by means of its scale and segment. The angle is then set in a similar manner, but in this case it represents the multiplier. The answer is then expressed by the position of the upper jaw. For examples in negative multiplication the lower jaw may be used for the same purposes as in division.

Examples in square root are performed by maintaining proportionate movements or speed between the stop block and angle gage.

The equal distances between the graduations in the respective scales make the peculiar construction of this instrument well adapted for automatic machine motions. The various adjustments referred to for working different examples are designed for machine computation.

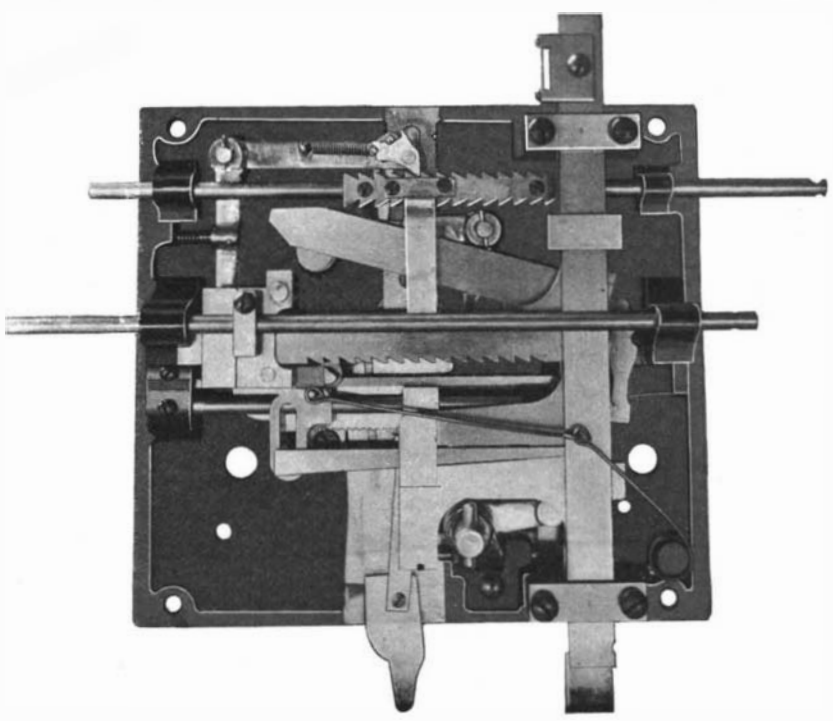
Computing Device for Type Justifiers.—The computing device for type justifiers is constructed to automatically perform simple examples in division and to give the quotient and remainder in order to determine the positions and motions necessary to locate the required sizes of space needed by the justifying machine.

This instrument necessarily performs more than the simple examples in division, as it is required to control and handle the other devices of the automatic mechanism, designating when they shall start and stop.

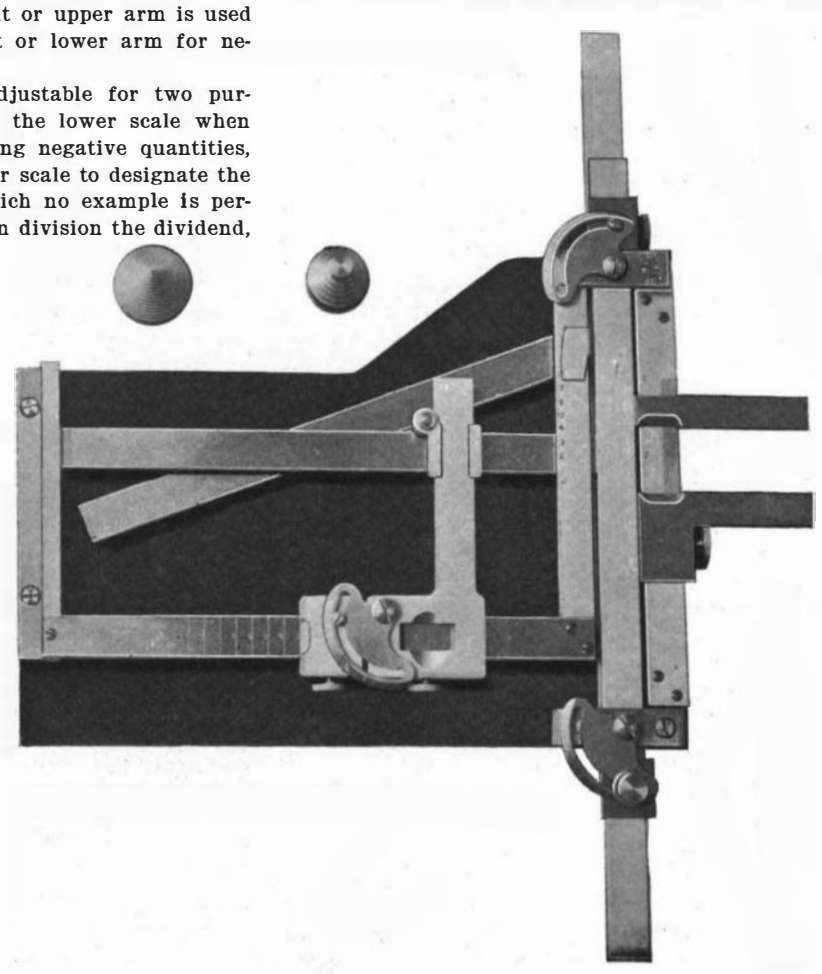
The line of type is given to the machine with metal separators between the words, making it necessary to subtract the amount of these separators from the total measurements.

The line of type including the separators is brought under the vertical guide of the measuring bar locating the stop block, which slides thereon, below the angle pivot, a distance equal to the line shortage, that is, the amount which the type line still remains short while it has all of the separators between the words. This is the distance to be divided by the number of separators.

The angle bar is lowered one step while each separator is inserted. This process tilts the computing angle on its pivot in accordance with the units of the divider, the stop block then moves leftward until it comes in contact with the computing bar. This gives the exact product in amounts representing units and fractions. The teeth on the under edge of the computing bar represents the units used, and in this case are made to represent the different sizes of spaces with which the machine is provided. If the pawl stops between two teeth this indicates that there is a fraction



COMPUTING DEVICE FOR TYPE JUSTIFIERS



COMPUTING TRIANGLE.