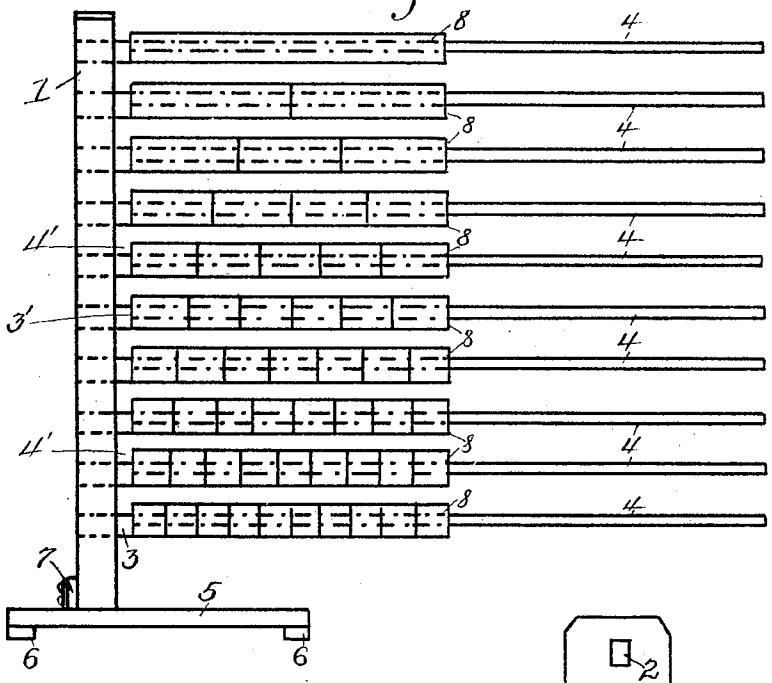
No. 805,365. PATENTED NOV. 21, 1905.

G. KNAPPE.

CALCULATING MACHINE.

APPLICATION FILED SEPT. 19, 1904.

Fig. 1.



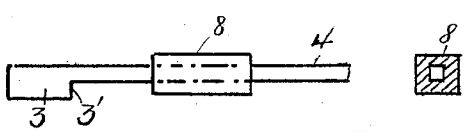


Fig. 3.

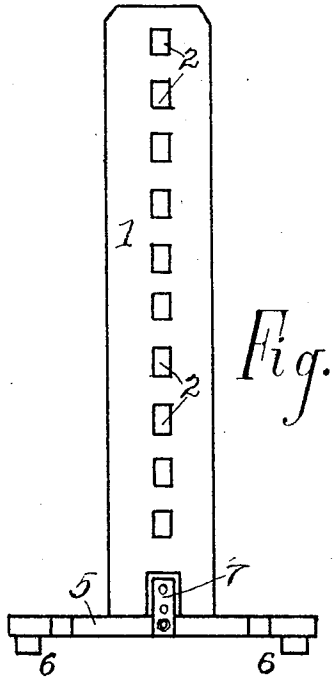


Fig. 2.

Witnesses:

[signature]

Fritz Heller.

Inventor:

Gustav Knappe

By [signature] & Co attys

UNITED STATES PATENT OFFICE.

GUSTAV KNAPPE, OF STETTIN, GERMANY.

CALCULATING-MACHINE.

No. 805,365. Specification of Letters Patent. Patented Nov. 21, 1905.

Application filed September 19, 1904. Serial No. 225,031.

To all whom it may concern:

Be it known that I, GUSTAV KNAPPE, a citizen of the German Empire, residing at Stettin, in the Province of Pomerania, Germany, have invented certain new and useful Improvements in Calculating-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has relation to a calculating device, the object of the invention being to provide novel and effective means for the teaching and easy learning of fractions.

In the accompanying drawings, Figure 1 shows a front view of the device. Fig. 2 is an end view thereof. Fig. 3 is a detached detail elevation of one of the arms with one of the fraction-indicating elements mounted thereon; Fig. 3ª, a detached view of said fraction-indicating element in cross-section.

The device embodies an upright or standard 1, provided with a plurality of vertically-disposed rectangular openings 2, in which are adapted to fit neatly the enlarged or boss ends 3 of horizontally-extending arms 4.

The upright 1 is mounted upon a suitable base 5, preferably provided with feet 6 in order that it will stand readily upon a table or like support. The upright 1 may be secured to the base in any desirable manner, as by a cleat 7.

The horizontally-extending arms 4 are adapted to have the fraction-indicating elements mounted thrreon, these in the present instance being shown in the nature of rectangular-shaped counters 8, which are slipped onto the horizontal arms from the free ends of the latter. In practice these counters are made of different lengths, so as to indicate different fractional parts. For instance, a single counter is usually placed on the uppermost horizontal arm or rod 4. On the next horizontal arm or rod 4 are placed two counters, their combined length being equal to the counter on the top arm or rod 4, and thus indicating halves. The counters on the succeeding arm may indicate thirds, the next one fourths, and so on to the lowermost arm, the number of the counters gradually increasing one by one from the uppermost to the lowermost arm. By such a device it will be evident that fractions may be readily computed, as it will be observed that it can be easily demonstrated to a pupil that one-half and two-fifths and one-tenth are equal to one whole.

To demonstrate the above example, it is only necessary to detach the mentioned fractions from their respective rods and place them on an empty rod and then insert them under the rod having counters representing the whole, which will clearly prove the absolute equality of the two quantities.

In practice the enlarged portion 3 of each arm 4 is made of a length greater than the thickness of the upright 1, and this enlarged portion forms a shoulder 3′, which forms a stop with which the inner counter 8 on each arm (except the counter on the top arm) engages. The inner end of the single counter on the top arm engages with the shoulder 3′ of that arm. These shoulders 3′ thus limit the movement inward of the counters toward the standard 1 and prevent the same being moved up close against the standard, thus leaving a space 4′ between the inner end of each inner counter and the standard, so that a pencil or pointer or like instrument may readily be placed back of inner counters to permit of all the counting elements on any one arm being simultaneously moved outward, if desired. This is readily accomplished, since the counters employed are of a considerably greater cross-sectional area than the enlarged ends or portions of the arms.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

In a calculating device, an upright, a series of horizontal arms mounted one above the other in said upright, each arm having an enlarged portion fitted in the upright with a shoulder adjacent the upright and having its outer end free, a series of counters mounted on said arms and spaced away from the upright by said shoulders, all the counters of one series being when assembled of the same length as all the counters of the other series, and the counters of each series being different in number from the counters of every other series, said counters being slidably mounted on said rods and removable over the free ends thereof.

In testimony whereof I affix my signature in the presence of two witnesses.

GUSTAV KNAPPE.

Witnesses:

HORST HIMER,

FRITZ HELLER.