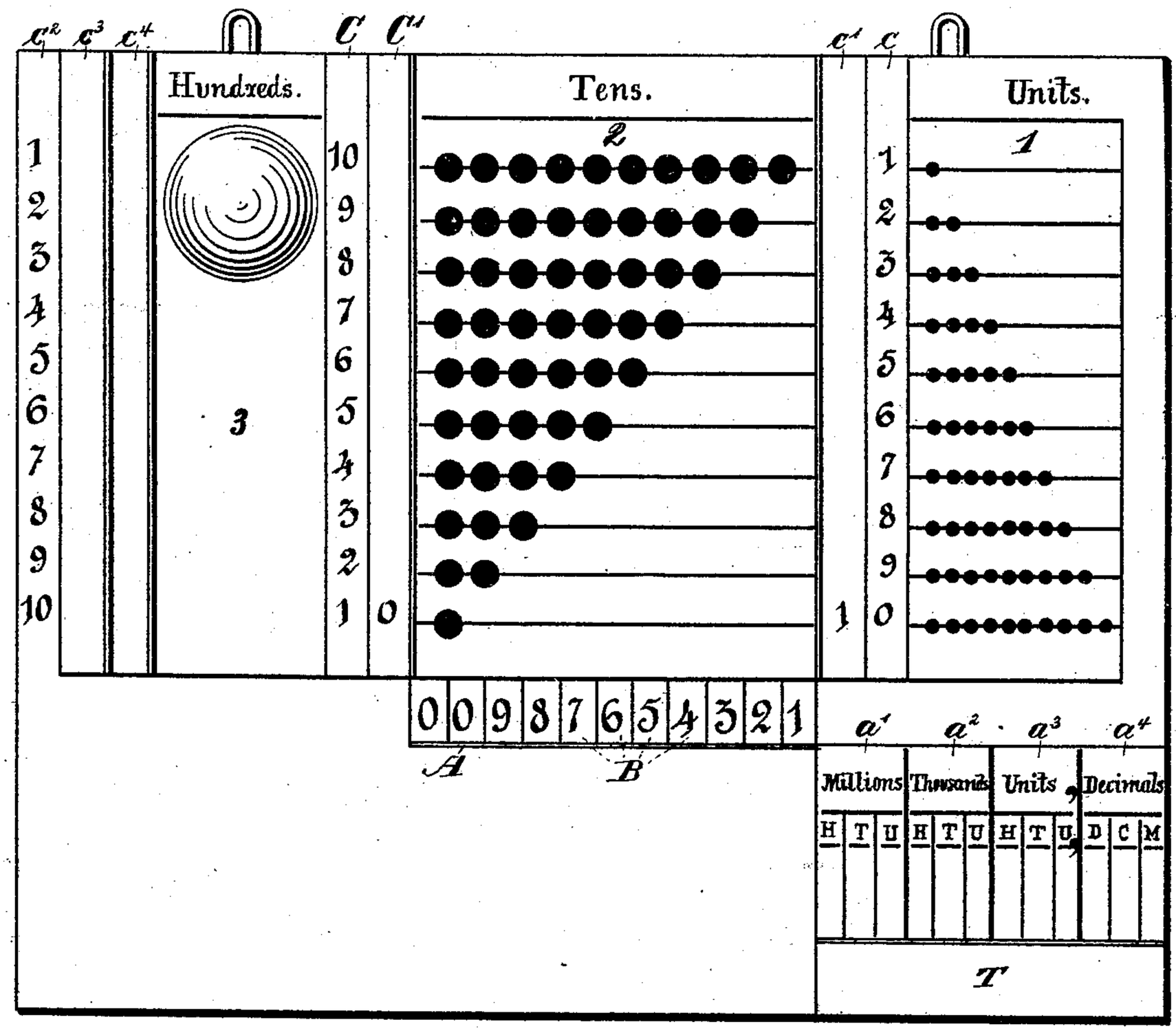
(No Model.)

C. PELLÈTIER.

BALL CALCULATOR.

No. 345,445. Patented July 13, 1886.



Witnesses:
W. E. Spulter
W. Knobloch

Inventor:
Charles Pelletier,
per Munn & Co
his attys.

UNITED STATES PATENT OFFICE.

CHARLES PELLETIER, OF CUSSY-LES-FORGES, FRANCE.

BALL-CALCULATOR.

SPECIFICATION forming part of Letters Patent No. 345,445, dated July 13, 1886.

Application filed March 30, 1885. Renewed April 22, 1886. Serial No. 199,874. (No model.) Patented in France October 8, 1884, No. 164,168; in Belgium March 2, 1885, No. 68,047; in England March 3, 1885, No. 2,803; in Spain March 5, 1885, No. 7,238; in Austria-Hungary March 6, 1885, No. 9,745 and No. 31,964, and in Italy March 15, 1885, No. 18,037.

To all whom it may concern:

Be it known that I, CHARLES PELLETIER, a citizen of the French Republic, residing at Cussy-les-Forges, in France, have invented certain new and useful Improvements in Ball-Calculators, (for which I have obtained Letters Patent in France, No. 164,168, dated October 8, 1884; in Belgium, No. 68,047, dated March 2, 1885; in Austria-Hungary, No. 9,745 and No. 31,964, dated March 6, 1885; in England, No. 2,803, dated March 3, 1885; in Italy, No. 18,037, dated March 15, 1885, and in Spain, No. 7,238, dated March 5, 1885,) of which the following is a full, clear, and exact description.

This invention relates to improvements in the abacus or ball-calculators, and has for its object to increase its scope and facilitate the teaching of the principles of arithmetic or counting.

The invention consists in novel features of arrangement of certain parts of the apparatus, as hereinafter fully described, and as pointed out in the claims, reference being had to the accompanying drawing, forming a part of this specification, which illustrates the invention by an elevation or face view.

The abacus is composed of a series of compartments, of which the compartment 1 contains ten wires, each provided with the number of balls corresponding with its numerical denomination, from 1 to 10, and they constitute the units, which latter are indicated in a column, *c*, on the left thereof, and increasing in value from top downward. Beside the column *c* is a column, *c'*, that has proper guide-grooves for the insertion of movable blocks B, eleven in number, from 1 to 0, and an additional 0, said blocks being held in a rack or groove, A. By means of this arrangement any number from 1 to 99 may be obtained or shown by sliding an appropriate numeral into column *c'*, opposite the fixed numeral thereof, said column *c'* having the fixed numeral 1 in front of the 0 to indicate 10.

On the left of column *c'* is a compartment, 2, also containing ten wires, the balls thereon having a size ten times as great as that of the unit-balls, and the arrangement being the reverse of that shown in compartment 1, the numerical order of the balls increasing from bottom upward. The balls in this compartment represent the tens, and by means of the fixed numerals in column C, and the column C' for the movable numerals B, any number from 1 to 100 may be obtained or shown. The numerals in this column increase upwardly from 1 to 10, inclusive, instead of from 1 to 0, as in column *c*, and in rear of the 1 the column C' has a fixed 0, to indicate the 10, in order that any number from 1 to 100 may be produced, the column for the movable blocks being here on the right of the column of fixed numerals, as will be readily understood.

On the left of column C is a third compartment, 3, that contains but one ball, the size of which is ten times that of the balls in compartment 2, and it represents hundreds. It has also a column, c^2, on the left thereof, that contains fixed numerals from 1 to 10, inclusive, and on the right of said column two columns, c^3 c^4, for the reception of movable numerals, by which arrangement any number from 1 to 1,000 may be obtained.

To further increase the scope of the abacus, I form in the lower right-hand corner of the board a table, T, divided into four columns, a' a^2 a^3 a^4. The latter column represents the decimals, the column a^3 the units, the column a^2 the thousands, and that a' the millions, each of said columns being subdivided into three columns representing the units, tens, and hundreds of their respective values, so that by the introduction into these subdivisions of movable numerals any number, from the one one-hundredth to 999,999,999, may be obtained.

The columns a' a^2 a^3 a^4 are properly inscribed with the words decimals, units, thousands, millions at the head thereof, and I preferably apply at the foot of the columns the designation of the equivalent values of the metric system of weights and measures, or by indicating these at the head of the subdivisions of the columns by their initial letters, as shown in column a^4, where D C M may indicate deci, centi, milli grams, or meters, or liters, &c., or by simply heading the subdivisions with the initials of the units, tens, and hundreds of each column.

The space on the left of table T, and below the compartments 1, 2, and 3, is or may be used as a blackboard for written exercises.

Having now described my invention, what I claim is--

1. In an abacus, the combination, with the counters thereof, arranged in progressive order from 1 to 0 or 10, of a column having fixed numerals opposite each string of balls indicating the value thereof, and one or more columns on the right or left of the column of fixed numerals, for the insertion of movable numerals, as described, for the purpose specified.

2. In an abacus, a series of unit-indicating balls arranged in a column from 1 to 0 or 10, from top downward, a series of balls indicating tens arranged in a column from 1 to 10 upward, and a single ball indicating hundreds, in combination with columns having fixed numerals and one or more columns to the right or left of the fixed numeral-column, for the introduction of movable numerals B, substantially as and for the purpose specified.

3. The combination, with the abacus composed of the ball-compartments 1, 2, and 3 and the columns c c', C C', c^2 c^3, and c^4, arranged relatively to the ball-compartments, as described, of the table T, substantially as and for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 1st day of March, 1885.

CHARLES PELLETIER.

Witnesses:

EMILE KANTER,

CAMILLE CHARROPPIN.