

April 14, 1925.

1,533,393

H. CORDT
PRINTING MECHANISM FOR THOMAS CALCULATING
MACHINES HAVING A KEY ADJUSTMENT
Filed Oct. 27, 1922

4 Sheets-Sheet 1

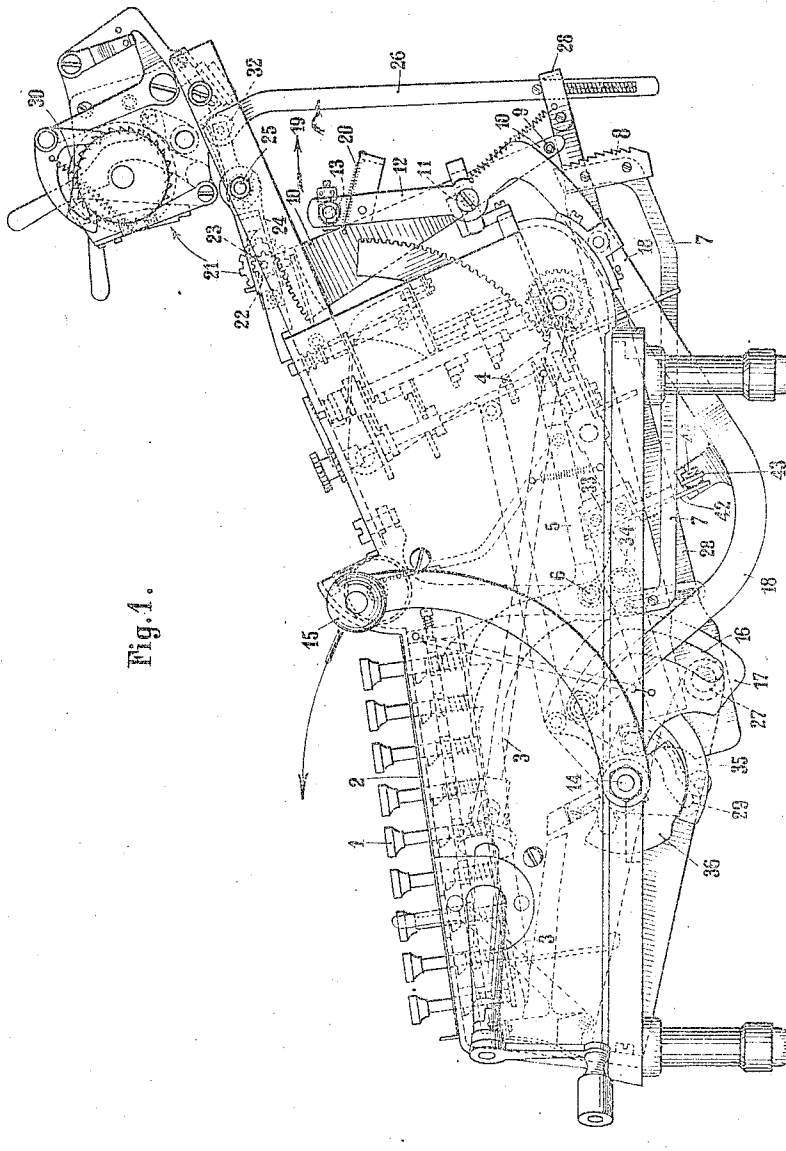


Fig. 1.

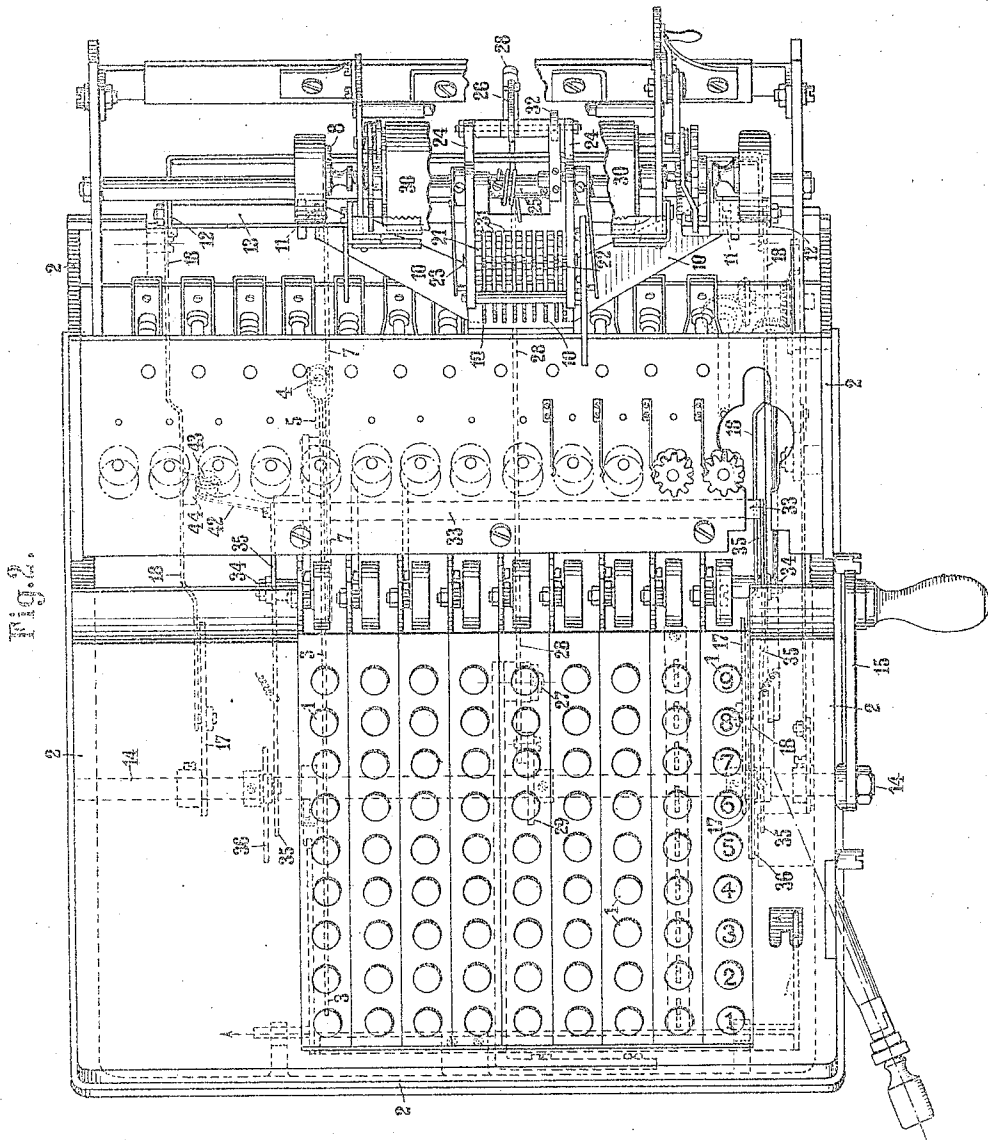
Inventor:
Hugo Cordt,
By B. Singer, Att.

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4 Sheets-Sheet 2



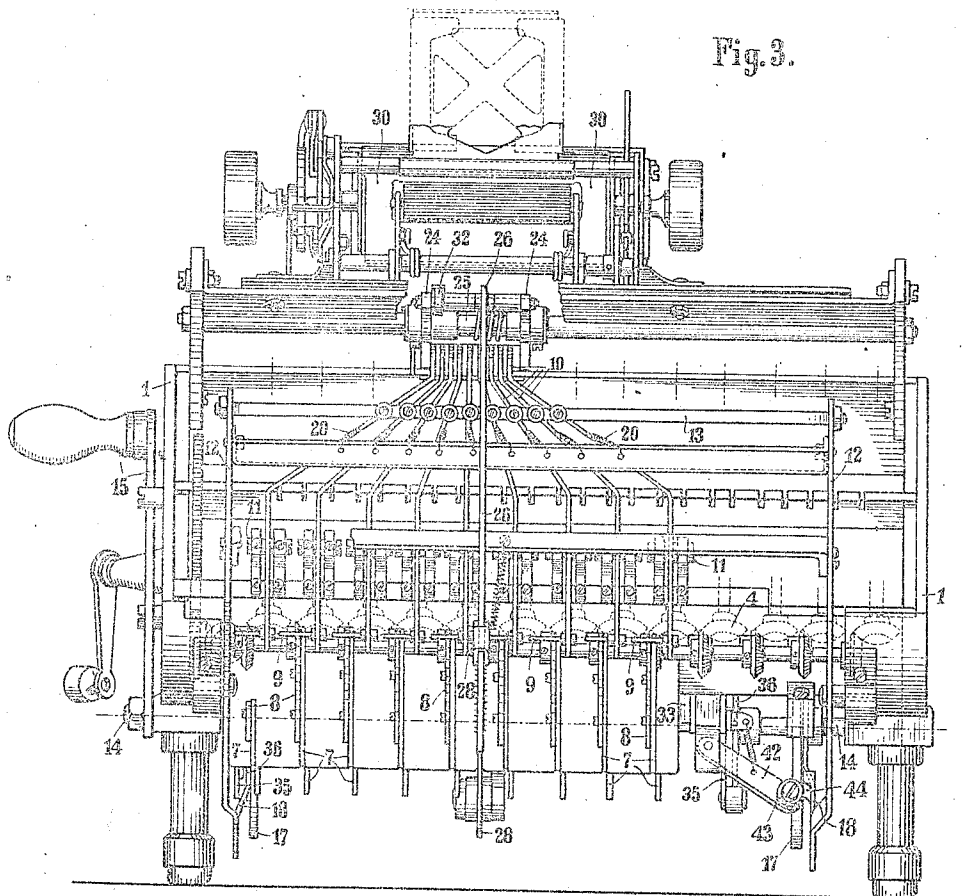
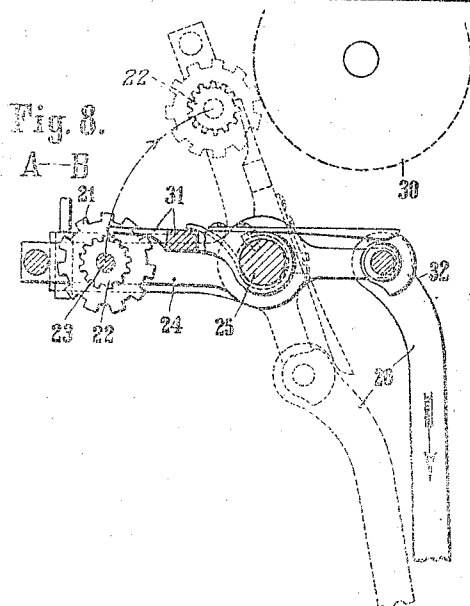
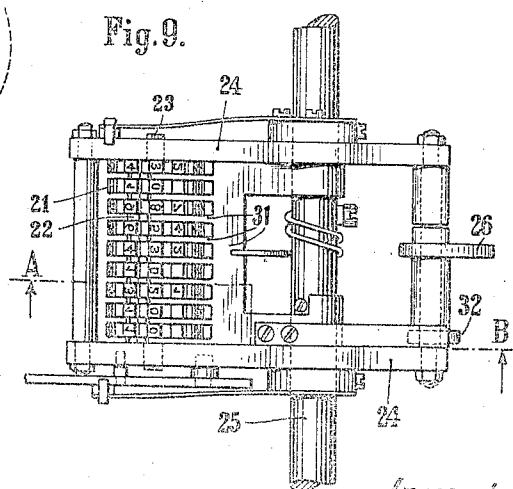
Inventor:
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By B. Swiger atty

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4 Sheets-Sheet 3



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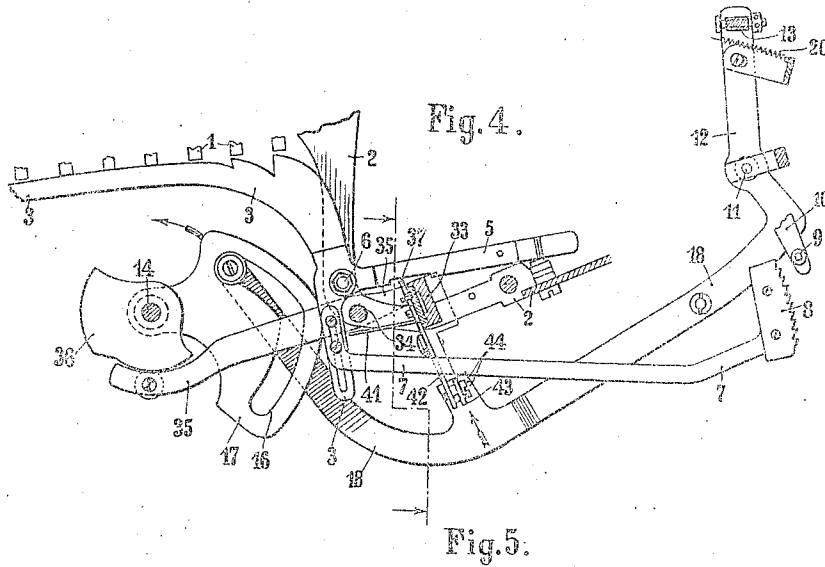
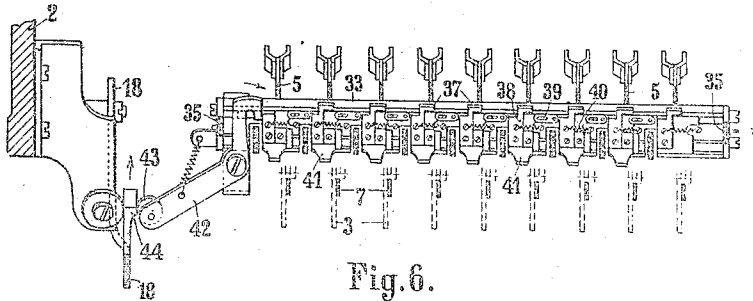
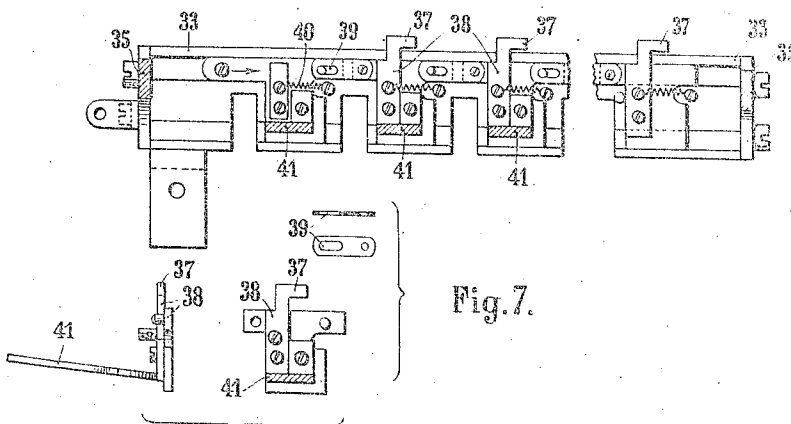
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4 Sheets-Sheet 4



Inventor:
Hugo Cordt.
By B. Singer, Atty.

UNITED STATES PATENT OFFICE.

HUGO CORDT, OF BERLIN, GERMANY, ASSIGNOR TO CARL LINDSTRÖM AKTIENGESellschaft, OF BERLIN, GERMANY.

PRINTING MECHANISM FOR THOMAS CALCULATING MACHINES HAVING A KEY ADJUSTMENT.

Application filed October 27, 1922. Serial No. 597,402.

To all whom it may concern:

Be it known that I, HUGO CORDT, of German nationality, residing at Berlin, Germany, have invented certain new and useful Improvements in and Relating to Printing Mechanisms for Thomas Calculating Machines Having a Key Adjustment; and I do hereby declare the following to be a full, clear, and exact description of the invention, of which the following is a specification.

The present invention relates to a printing mechanism for Thomas calculating machines having a key adjustment and especially to such Thomas calculating machines which have the step rolls arranged vertically to the machine plate and the transmission to the counting mechanism effected by spur wheel drives.

The characteristic feature of the invention consists therein that the levers actuating the adjusting wheels and moved from the keys the step sectors are set simultaneously which according to their having been set limit the path of tooth sectors and move the printing type wheels so that the latter according to the keys of the calculating machine are also set in order then to be projected against a printing roll.

Upon the accompanying drawings one mode of carrying out the invention is shewn by way of example and it is—

Fig. 1 a view of the calculating machine shewing the main parts of the key mechanism for the adjusting mechanism of the printing device,

Fig. 2 a plan,

Fig. 3 a back view,

Fig. 4 shews in a side view the adjustment of the step sectors and the driving mechanisms for the printing type wheels.

Fig. 5 in a front view and Figs. 6 and 7 on an enlarged scale the mechanism for the zero printing,

Fig. 8 in a side view and Fig. 9 in a plan the supporting strap with driving lever for the printing type wheels.

Referring to Figures 1 to 3, 1 denotes the keys in the machine frame 2 for adjusting the known setting levers 3 which swing on pins 6 and which by means of extended arms 5 drive the known step roll wheels 4. On these setting levers 3 are mounted arms 7 with a downward crank and

an extension to the rear carrying the step sectors 8. Every step sector is fitted with 9 steps, each one of which corresponding to a simple figure according to the value of the figure of a pressed down key 1.

The step sectors 8 are mounted eccentrically with regard to the pivot 6 so that according to the raising of these sectors 8 their distance from the pins 9 of the tooth sectors 10 swinging about the shaft 11 is altered.

On the shaft 11 is mounted a strap 12 with a traverse 13 striking against the tooth sectors 10. The strap 12 is turned about the shaft 11 from a crank handle mounted on the main shaft 14 with the aid of discs 17 having curved slots 16 by arms 18 of the strap 12 having rolls engaging with the curved slots 16. With every pulling of the crank 15 and turning of the shaft 14 the arms 18 are therefore swung out in such a manner that the strap 12 and the tooth sectors 10 move in the direction of the arrow 19.

Now the tooth sectors 10 are coupled with the strap 12 by means of springs 20. If a certain key has been pressed down and consequently a certain step sector 8 has been lifted, the tooth segment 10 belonging thereto can be pulled so far only until its pin 9 strikes against the corresponding step of the step sector. The movement of this tooth segment is thereby blocked while the strap 12 can continue to move at the same time putting the corresponding coupling spring 20 of the arrested tooth segment 10 under tension.

Thus by pressing down the keys 1 and by pulling the crank 15 the tooth segments 10 are set according to the value of the figure of the pressed key 1.

The movement of the tooth segments 10 is transmitted to a set of printing type wheels 21. These printing type wheels 21 arranged side by side (compare for instance Fig. 9) are provided with toothed wheels 22 which mesh with the tooth segments 10. They are mounted so that they can rotate independently on the shaft 23 of a common strap 24 (Fig. 8) which swings about a fixed axle 25 and which is moved by a drawing rod 26. For this purpose the drawing rod 26 is positively connected to a lever 28 swing-

ing about the axle 27, the lever being driven by a slotted disc 29 of the shaft 14. The curved slot of this disc is shaped in such a manner that only during the last stage of the driving movement of the crank 15 the lever 28 is swung out thereby picking up the drawing rod 26, in other words at the moment the type wheels 21 on the shaft 23 had already been set by the toothed segments 10. The position of the type wheels 21 in the printing position in which they strike against the printing roll 30 has been shown in dotted lines in Fig. 8.

In order to effect an accurate adjusting and moving of the printing type wheels 21 after the swinging out from the toothed segments 10 a special arrangement has been made. It consists of a cam 31 mounted on the fixed axle 25 of the frame 24, the front teeth of the cam being able to engage with the separate toothed wheels 22 of the printing type wheels 21. When the toothed wheels 22 are engaged with the toothed segments 10, the cam 31 controlled by the curve disc 32 remains out of engagement with the toothed wheels 22 so that it accurately adjusts and arrests these toothed wheels according to the space of tooth which it faces, so that an absolutely sure printing of the set types on the printing roll in an accurate level with the line takes place. In order to achieve this the non-circular disc 32 is rigidly connected with the pulling lever 26, whereby its relative rotation with regard to the frame 24 and thereby the moving of the cam 31 is effected.

It is of importance for the printing device that also the zero printing takes place automatically in such a manner that all zeros to the right of a figure are also printed automatically since for the setting of a zero the keys are not specially actuated. In order to effect this with the present printing device it becomes necessary that when setting a step sector 8 from a key 1, the step sectors preceding on the right are forced to move by a single step corresponding to the zero value of the type wheels in order to enable that upon a swinging out of the common strap 12 for the toothed segments 10 moving the type wheels the type wheels preceding on the right are set for the zeros. For this purpose a special rail 33 has been arranged crossways in the machine, the rail swinging about a pin 34 (see Figs. 1 and 4). This swinging movement is produced by an arm 35 which bears against the curve disc 36 on the main shaft 14. In case of this swinging movement pin-like detents or projections 37 may bear against the arms 5 of the adjusting levers 3 whereby these are swung out in such a manner that the step sectors 8 are raised to the zero stage corresponding to the zero figure which shall be printed. The pins

37 can however only raise the arms 5 if they are within the paths of these arms. In the normal position this is not the case, for the pins or projections 37 are not directly mounted on the swinging rail 33 but on special slides 38 (see Figs. 5 and 6) movable thereon coupled to each other by means of pins and slots 39 and by means of springs 40 attached to the rail 33 in such a manner that in case the foremost slide piece (Fig. 6) is moved in the direction of the arrow the other slide pieces are forced to follow by the action of their springs 40. If however a slide piece is prevented from following this movement also the guide pieces to the right remain stationary. By the moving of the slide pieces 38 in the direction of the arrow according to Fig. 6, the stops 37 are brought out of the path of the arms 5 so that at first the step sectors 8 are not actuated by the swinging of the rail 33. Those slide pieces however which do not follow these movements strike with their stops 37 against the arms 5 when the rail 33 makes a swinging motion and cause these arms to follow the movement by the amount of such oscillating movement so that from these slide pieces the corresponding step sectors 8 are forced to follow the movement by an angle required for the setting of the zero step. In order to effect the arresting of such slide pieces 38 from a set step sector 8, the slide pieces 38 having arms 41 (see Fig. 4) are provided which with reference to the arms 7 of the step sectors or of the adjusting levers 3 respectively can move freely sideways in the zero-position of these adjusting levers. If however a lever 3 is swung out by pressing down a key 1, the arm 7 or its cranked part respectively with which it is fastened to the lever 3 places itself in front of the detent 41 of the respective slide piece 38 and in rear of the latter on the side displacement. Thereby however all slide pieces 38 following this blocked slide piece to the right are arrested simultaneously. If now the rail 33 is swung out these slide pieces which are not displaced sideways move by means of the stops 37 the respective arms 5 of the adjusting levers 3 and thereby the respective step sectors 8 by one step.

The cross moving of the slide pieces 38 in the rail 33 is started by an arm 42, which together with the roller 43 effects a cross movement of the slide pieces 38 towards the left (of Figs. 5 and 6) on the incline 44 of the pulling lever 18 in the direction of the arrow of Fig. 4 inasmuch as they are not blocked as described in the foregoing. The detents 37 thereby leave the path of the arms 5 so that—as this has already been described in the foregoing—the arms 41 of the slide pieces 38 can unrestrictedly pass the cranked parts of the arms 37 of the

step sectors 8. From this it follows that to the left of a set figure no zero is printed but only to the right of a set figure.

Instead of fastening the projections 37 to the slide pieces 38 of the rail 33 they can also be arranged in the slide rail 33 swinging about parallel axles or pins and coupled to each other by means of springs in such a manner that upon a swinging out of the foremost projections 37 those following to the right are also swung out by the action of the spring, while in case of a prevention of the turning of the axle of a projection 37, perhaps by an arm which can be lowered to the respective axle entering into the reach of a swung out step sector, the projections following to the right also remain idle.

I claim as my invention:—

1. Printing mechanism for Thomas calculating machines with keyboard adjustment and in which printing type wheels disposed in an oscillatory frame are advanced against the platen, comprising adjusting levers, adjusting wheels, printing type wheels and driving segments, said adjusting levers for the adjusting wheels having graded sectors for the values 1 to 9 to limit the stroke of the said driving segments for the printing type wheels and a bar oscillatably supported in the frame of the machine and provided with slide pieces which are movably supported thereon, the said graded sectors cooperating with said bar.

2. Printing mechanism for Thomas calculating machines, as set forth in claim 1, and including an oscillatory bar disposed for the purpose of printing a cipher at the right of a value to which the machine has been adjusted, a main shaft having a cam disc to operate said bar, the said slide pieces having adjustable projections and said bar causing a movement of said adjustable projections to take along the said adjusting levers and thereby the sectors one step in correspondence with the cipher, while an advance of the corresponding graded sector does not take place as long as the said adjustable projections are located outside the plane of the said adjusting levers.

3. Printing mechanism for Thomas calculating machines, as set forth in claim 1, characterized in this that the said lugs are mounted on slidable or rotatable slide pieces, are provided with slots and pins whereby they are guided relatively to each other and are also provided with interconnecting springs so arranged that upon displacement

of a movement of a slide piece the next succeeding elements at the right thereof follow this movement, the first slide piece having an arm, an adjusting lever being provided for the gear segments, and said lever having an inclined surface to cooperate with said arm of the first slide piece.

4. Printing mechanism for Thomas calculating machines, as set forth in claim 1, characterized in this that the slide pieces of the bar which are located at the right of an adjusted sector, are provided with locking arms, and the said adjusting levers having arms provided with cranked portions, said locking arms being arranged to pass, in the initial position of the sectors, the cranked portions of the arms of the adjusting levers, and being arranged in an intermediary position of the sectors to enter the path of said offset cranked portions of the arms whereby lateral free displacement is prevented.

5. Printing mechanism for Thomas calculating machines with keyboard adjustment and in which printing type wheels disposed in an oscillatory frame are advanced against the platen, comprising adjusting levers, adjusting wheels, printing type wheels and driving segments, said adjusting levers for the adjusting wheels having graded sectors for the values 1 to 9 to limit the stroke of the said driving segments for the printing type wheels and a bar oscillatably supported in the frame of the machine and provided with slide pieces which are movably supported thereon, the said graded sectors cooperating with said bar, the said slide pieces having adjustable projections and said bar causing a movement of said adjustable projections to take along the said adjusting levers and thereby the sectors one step in correspondence with the cipher, while an advance of the corresponding graded sector does not take place as long as the said adjustable projections are located outside the plane of the said adjusting levers, said sliding bar having parallel pivots and interconnecting springs, said adjustable projections being mounted on said pivots, and said pivots being arranged to enter the first of the said adjusting levers.

In testimony whereof I have signed my name to this specification.

HUGO CORDT.

Witnesses:

HERMANN KEIBEL,
MAX FREUND.