H. GOLDMAN.

CALCULATING MACHINE.

APPLICATION FILED NOV. 4, 1911.

1,068,051.

Patented July 22, 1913.

2 SHEETS—SHEET 1.

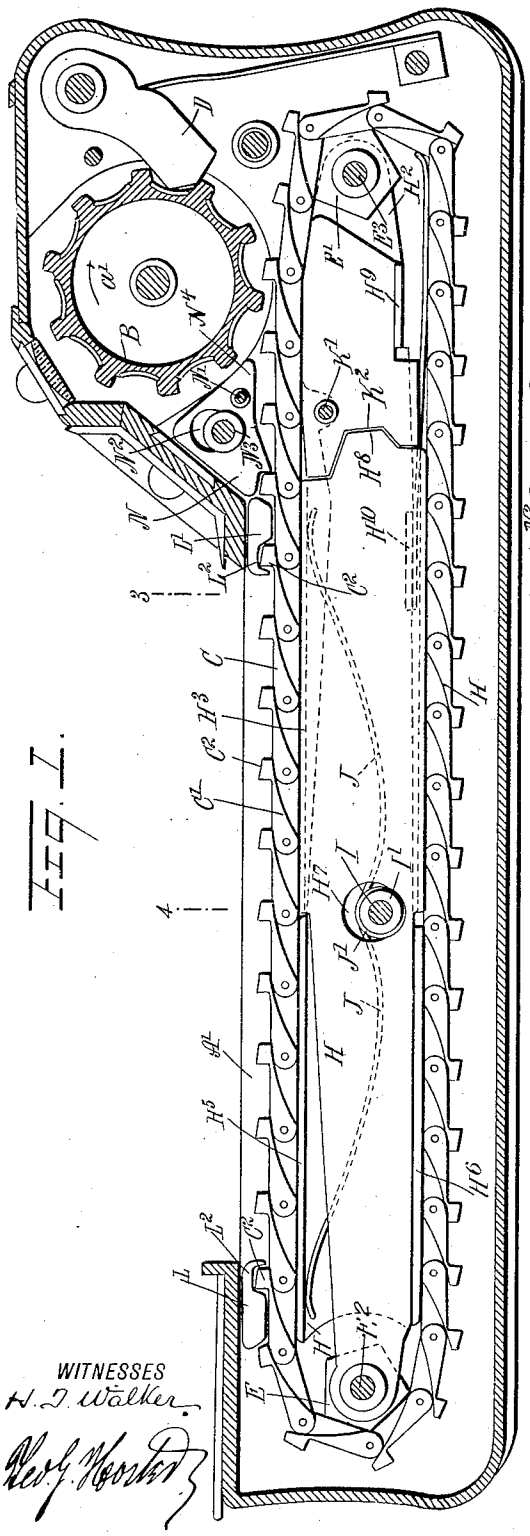


Fig. 1.

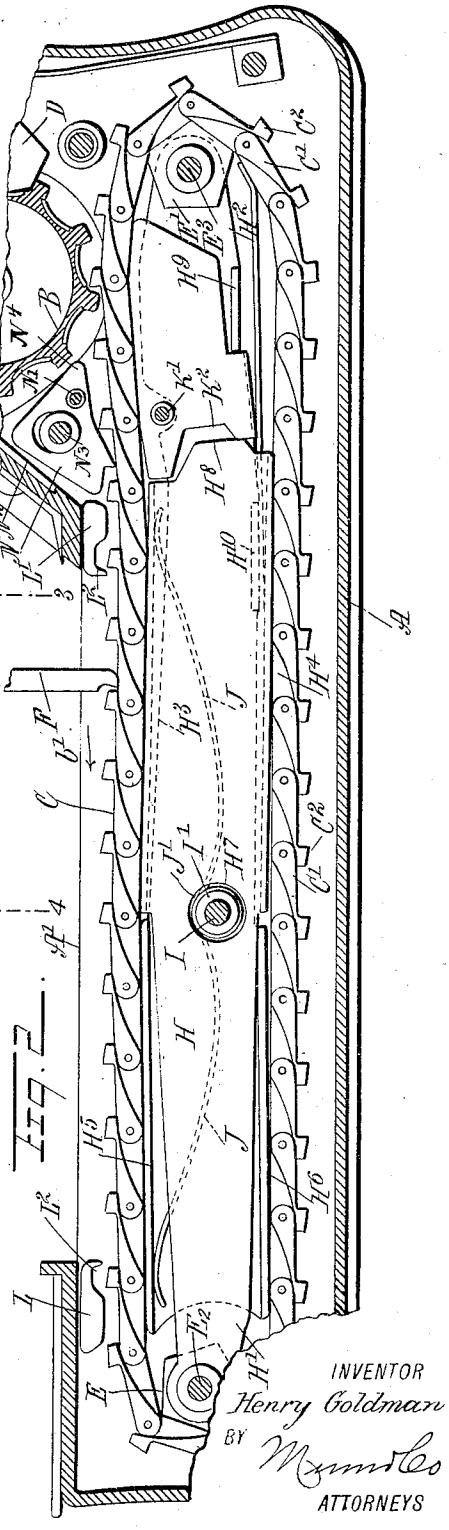


Fig. 2.

WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

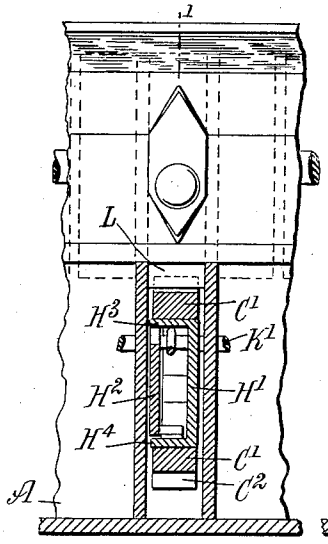


Fig. 4.

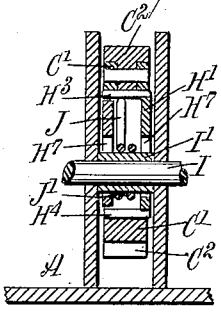
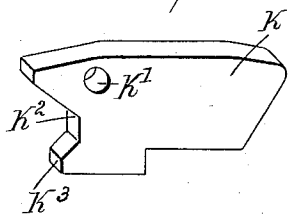


Fig. 5.



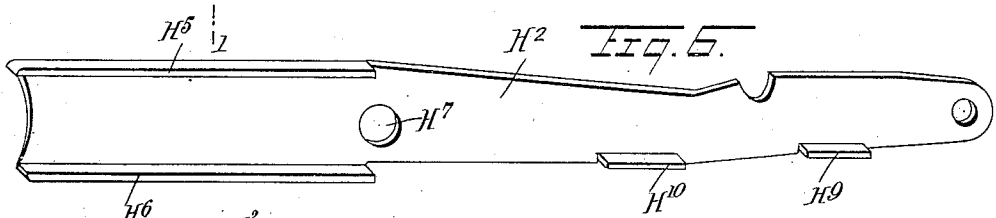


Fig. 6.

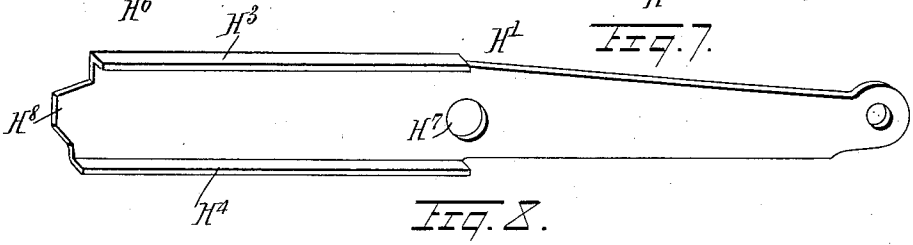
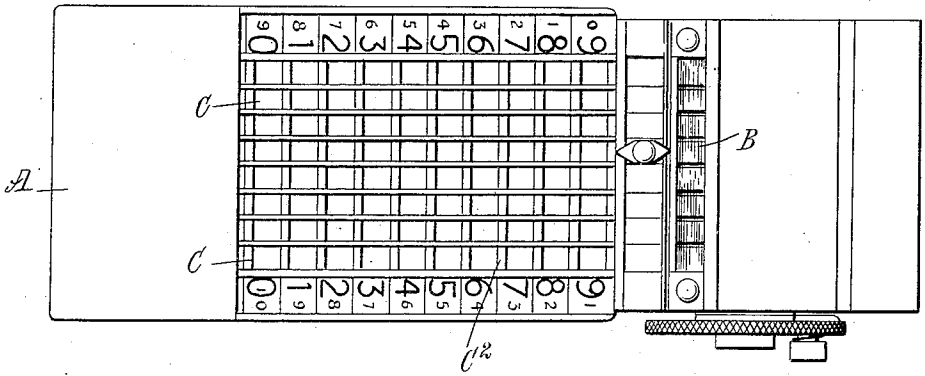


Fig. 7.

Fig. 8.



WITNESSES

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UNITED STATES PATENT OFFICE.

HENRY GOLDMAN, OF NEW YORK, N. Y., ASSIGNOR TO ARITHSTYLE COMPANY, OF NEW YORK, N. Y.

CALCULATING-MACHINE.

1,068,051. Specification of Letters Patent. Patented July 22, 1913.

Application filed November 4, 1911. Serial No. 658,500.

To all whom it may concern:

Be it known that I, HENRY GOLDMAN, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Calculating-Machine, of which the following is a full, clear, and exact description.

The invention relates to calculating machines of the endless chain type, such, for instance, as is shown and described in the Letters Patent of the United States, Nos. 786,282 and 956,846, granted to me on April 4, 1905, and May 3, 1910, respectively.

The object of the present invention is to provide a new and improved calculating machine arranged to enable the user to obtain a good leverage at any point of the operating surface for depressing the chain prior to imparting a traveling motion to the same, and to properly connect the chain with the associated numeral wheels, thus insuring an accurate and easy working of the machine.

For the purpose mentioned, use is made of a series of numeral wheels adapted to be actuated by the series of endless chains arranged to make tangential contact with the said numeral wheels, a yielding platform for each chain, and a contact device for moving each chain into tangential engagement with the associated numeral wheel, the said platform and contact device having engaging and locking means to actuate the contact device on depressing the platform for moving the chain into operative engagement with the associated numeral wheel, and to lock the contact device against further movement on further depression of the platform.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is an enlarged longitudinal section of the calculating machine with the parts in normal inactive position, the section being on the line 1—1 of Fig. 3; Fig. 2 is a like view of the same and showing the chain and platform depressed and the chain in operative contact with the associated numeral wheel; Fig. 3 is a cross section of the same on the line 3—3 of Fig. 1; Fig. 4 is a similar view of the same on the line 4—4 of Fig. 1; Fig. 5 is a perspective view of one of the contact levers; Figs. 6 and 7 are perspective views of the platform levers forming a platform for an endless chain; and Fig. 8 is a plan view of the calculating machine.

The calculating machine is mounted in a suitably constructed frame A in which is mounted to turn a series of numeral wheels B, each of which is adapted to be turned in the direction of the arrow a' by an endless chain C, and return movement of each numeral wheel B is prevented by a spring-pressed dog D fulcrumed in the casing A. Each endless chain C passes around polygonal wheels E and E′ mounted to turn on shafts E^2, E^3 fixed in the casing A, and each chain C is formed of links C′ each having a tooth or a projection C^2 for engagement by a stylus F employed for actuating each endless chain in the manner hereinafter more fully described.

Intermediate the runs of each endless chain C is arranged a yielding platform H formed of the levers H′ and H^2 fulcrumed on the shafts E^2 and E^3 and provided at their free end portions at the top and bottom with flanges H^3, H^4 and H^5, H^6, of which flanges H^3 and H^5 abut at their adjacent ends, and the flanges H^4 and H^6 are in close proximity to each other at their adjacent ends, so that the flanges H^3, H^5 and H^4, H^6 form practically continuous surfaces for the upper and lower runs of the endless chain C to rest on. The platform levers H′ and H^2 are provided with large registering openings H^7 through which extends a stop pin I held in the sides of the casing A, and provided, for each pair of levers H′ H^2, with a roller I′ on which is coiled the middle portion J′ of a spring J bearing with its free ends on the upper flanges H^3 and H^5, so as to hold the platform levers H and H′ normally in an uppermost position, as shown in Fig. 1.

By arranging the platform levers H and H′ in the manner described, it is evident that when a downward pressure is exerted by the stylus F on the endless chain C at any point in the opening A′ of the casing A, then the platform H yields in a downward direction, that is, the two levers H and H′ swing downward in unison into the position shown in Fig. 2, and when the pressure is released, then the spring J returns

the platform levers to their normal uppermost position as shown in Fig. 1.

When the endless chain C is in a normal position, as shown in Fig. 1, then the chain is out of contact with its associated numeral wheel B, and in order to move the chain C into engagement with its associated numeral wheel B at the time the chain C is depressed by the stylus F, as above explained, use is made of a contact lever K extending intermediate the runs of the chain C and fulcrumed on a pin K′ attached to the casing A, the contact lever K being located intermediate the free end of the lever H′ and the chain wheel E′, as plainly indicated in Figs. 1 and 2. The upper edge of the lever K engages the under side of the endless chain C directly opposite the bottom of the associated numeral wheel B and the fulcrum end of the contact lever K is provided with a notch K^2 into which projects a tooth H^8 formed on the free end of the lever H′, so that when the latter swings downward, as previously explained, then a swinging motion is given by the tooth H^8 to the contact lever K whereby the latter lifts the upper run of the chain C into engagement with the associated numeral wheel B, as plainly indicated in Fig. 2. At the time the contact lever K has moved the upper run of the endless chain C into proper engagement with the associated numeral wheel B then the tooth H^8 moves out of the notch K^2 and into engagement with the lower edge K^3 at the fulcrum end of the contact lever K, thus locking the said contact lever K in raised position at the same time allowing further downward swinging movement of the lever H′ should further pressure be exerted on the chain C by the stylus F. Thus if the platform C is pressed downward more than necessary after the chain C is in proper engagement with the associated numeral wheel B, then the said chain is not affected relative to the numeral wheel and consequently the chain is not liable to act as a brake on the numeral wheel. When the chain C is depressed as described and the stylus F is moved in the direction of the arrow b' then the associated numeral wheel B is turned in the direction of the arrow a'.

The lever H^2 is provided near its fulcrum end with a flange H^9 for the contact lever K to rest on when the parts are in normal position, as shown in Fig. 1, and the said lever is also provided with a flange H^{10} for the flange H^4 to abut against to limit the upward swinging movement of the levers H′ and H^2.

When the chain C is in an uppermost position it is locked against movement by two locking members L and L′ fixed in the casing underneath the top thereof and adjacent the ends of the opening A′, each locking member L, L′ extending through its under side in close proximity to the top of a corresponding link C′ between adjacent link teeth C^2, and each locking member L, L′ is provided with a recess L^2 engaging one of the link teeth to lock the chain C against movement in the direction of the arrow b' or the inverse direction thereof. Each locking member has its ends beveled to fit between two adjacent teeth so that in case the chain C is not pulled to its full extent or too far, by the use of the stylus, then the beveled ends of each locking member L and L′ tend to move the chain in the direction of its length to correct position on releasing of the chain by the stylus and on returning the chain into upper position by the action of the spring J. In order to unlock the chain C it is necessary to depress the same by the use of the stylus F or other means, as previously explained and shown in Fig. 2, so that the corresponding teeth C^2 of the links C′ move out of the recesses L^2 and clear the locking members L and L′.

It is understood that the upper run of the chain C moves in unison with its platform H and consequently both teeth C^2 in engagement with the spaced locking members L, L′ move simultaneously out of engagement to unlock the chain and allow the same to be pushed in the direction of the arrow b' by the stylus F.

A dog N is adapted to engage a tooth C^2 of the chain C at the time the latter is in its uppermost normal position, as shown in Fig. 1, to prevent movement of the chain C in the inverse direction of the arrow b' and protecting the numeral wheels against derangement. The dog N is fulcrumed at N′ in the casing A adjacent the numeral wheel B, and the dog is provided with an elongated opening N^2 through which extends a stop pin N^3 fixed to the casing and serving to limit the upward swinging movement of the dog N. By reference to Fig. 2, it will be noticed that if the chain C, when depressed, should accidentally be moved in the inverse direction of the arrow a' then the dog N is adapted to engage a rearwardly moving tooth C^2 to prevent the chain from turning the numeral wheel B. The dog N has a rearward extension N^4 close to the link tooth C^2 preceding the one engaging the numeral wheel B at the time, so that when the chain is pulled in the direction of the arrow b' the preceding link C′ is prevented from swinging upward and hence the link engaged with the numeral wheel is not liable to slip from under the numeral wheel without turning the same.

Suitable means (not shown) are provided for turning one numeral wheel from the preceding one when the latter completes a revolution, but as such means may be of any approved construction it is not deemed necessary to illustrate or describe the same.

A device for re-setting the numeral wheels is also provided, but as it corresponds to the one shown and described in the Letters Patent, No. 786,282, it is not deemed necessary to describe or show the same in detail.

It will be noticed that the contact lever K is held locked in a raised position by the platform H after the same has been depressed and hence when a number of numeral wheels B are turned simultaneously (from 9 to zero) then the extra pull required on the chain C does not affect the relation of the chain link in engagement at the time with the corresponding numeral wheel B and hence no greater downward pressure on the chain is required.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A calculating machine, comprising a series of numeral wheels, a series of endless chains for making tangential contact with the said wheels, a yielding platform for each chain, and a contact device for moving each chain into tangential engagement with the associated numeral wheel, the said platform and contact device having engaging and locking means to actuate the contact device on depressing the platform for moving the chain into operative engagement with the associated numeral wheel and to lock the contact device against further movement on further depression of the platform.

2. A calculating machine, comprising a series of numeral wheels, a series of endless chains for making tangential contact with the said wheels, fixed locking devices for each chain, and spaced apart, the said locking devices normally engaging the corresponding chain at widely spaced points for locking the corresponding chain against movement, and a yielding platform for each chain and yielding alike throughout its length when depressed at one point to disengage the chain simultaneously from the said locking devices.

3. A calculating machine, comprising a series of numeral wheels, a series of endless chains for making tangential contact with the said numeral wheels, and a yielding platform for each chain and consisting of co-acting members pivoted at opposite ends and moving in unison when either member is depressed.

4. A calculating machine, comprising a series of numeral wheels, a series of endless chains for making tangential contact with the said numeral wheels, a yielding platform for each chain and consisting of co-acting members moving in unison when either member is depressed, and a contact member for moving each chain into tangential contact with its associated numeral wheel, the said contact member and one of the said platform members having engaging means for actuating the said contact member on depressing either platform member.

5. A calculating machine, comprising a series of numeral wheels, a series of endless chains for making tangential contact with the said wheels, a yielding platform for each chain and consisting of platform levers pivoted at opposite ends and connected with each other to move in unison, and a contact lever for moving each chain into tangential contact with its associated numeral wheel, the said contact lever and one of the platform levers having engaging and locking means to actuate the contact lever on depressing either platform lever and to lock the said contact lever against further movement after the chain engages the numeral wheel on further depressing the platform.

6. A calculating machine, comprising a series of numeral wheels, a series of endless chains for making tangential contact with the said wheels, a yielding platform for each chain and consisting of platform levers pivoted at opposite ends and connected with each other to move in unison, and a contact lever for moving each chain into tangential contact with associated numeral wheel, the said contact lever having a recess at one end and the adjacent end of a platform lever having a projecting tongue normally engaging the said recess for actuating the contact lever and adapted to engage the end of the contact lever to lock the latter against movement.

7. A calculating machine provided with an endless chain formed of links each having a projecting tooth, a yielding platform for the chain and formed of co-acting members pivoted at opposite ends and moving in unison when either member is pressed, and fixed locking members for the chain and located approximately opposite the free ends of the said platform members, each of the said locking members extending in close proximity to the upper face of a link and each locking member having a recess fitting the adjacent link tooth.

8. A calculating machine provided with an endless chain formed of links each having a projecting tooth, a yielding platform for the chain and formed of co-acting members pivoted at opposite ends and moving in unison when either member is pressed, and fixed locking members for the chain and located approximately opposite the free ends of the said platform members, each of the said locking members extending in close proximity to the upper face of a link, and extending with its ends close to adjacent link teeth, the said ends being beveled.

9. A calculating machine provided with an endless chain formed of links each having a projecting tooth, a yielding platform for the chain and formed of co-acting mem-

bers pivoted at opposite ends and moving in unison when either member is pressed, and fixed locking members for the chain and located approximately opposite the free ends of the said platform members, each of the said locking members extending in close proximity to the upper face of a link, and extending with its ends close to adjacent link teeth, the said ends being beveled, and each of the said locking members having a recess engaging one of the said teeth.

10. A calculating machine provided with an endless chain, a yielding platform for the said chain and consisting of platform levers fulcrumed at their outer ends and provided with elongated openings, a fixed stop pin passing through the said openings, and a spring resting on the said stop pin and bearing at its free end on the said platform levers to hold the platform normally in an uppermost position.

11. A calculating machine provided with an endless chain formed of links each having a tooth, a yielding platform for the said chain and consisting of platform levers fulcrumed at their outer ends and provided with elongated openings, a fixed stop pin passing through the said openings, a spring resting on the said stop pin and bearing at its free end on the said platform levers to hold the platform normally in an uppermost position, and fixed locking members spaced apart and each extending in close proximity to the upper face of a link and between adjacent teeth, each locking member having a recess fitting one of the link teeth.

12. A calculating machine provided with an endless chain, wheels around which passes the said chain, a platform intermediate the runs of the chain and formed of two platform levers fulcrumed on the shafts of the said wheels, the levers being provided at their free end portions with abutting flanges forming surfaces for the runs of the chain to rest on.

13. A calculating machine provided with an endless chain, wheels around which passes the said chain, a platform intermediate the runs of the chain and formed of two platform levers fulcrumed on the shafts of the said wheels, the levers being provided at their free end portions with abutting flanges forming surfaces for the runs of the chain to rest on, and a spring fixed at its middle and bearing with its free ends on the said levers.

14. A calculating machine provided with an endless chain, wheels around which passes the said chain, a platform intermediate the runs of the chain and formed of two platform levers fulcrumed on the shafts of the said wheels, the levers being provided at their free end portions with abutting flanges forming surfaces for the runs of the chain to rest on, the said levers being provided intermediate their ends with elongated openings, a fixed stop pin extending through the said openings, and a spring resting at its middle on the said stop pin and bearing with its free end on the said levers.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY GOLDMAN.

Witnesses:

THEO. G. HOSTER,

PHILIP D. ROLLHAUS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."