H. HOPKINS.

CALCULATING MACHINE.

APPLICATION FILED OCT. 31, 1911.

1,178,073.

Patented Apr. 4, 1916.

3 SHEETS—SHEET 1.

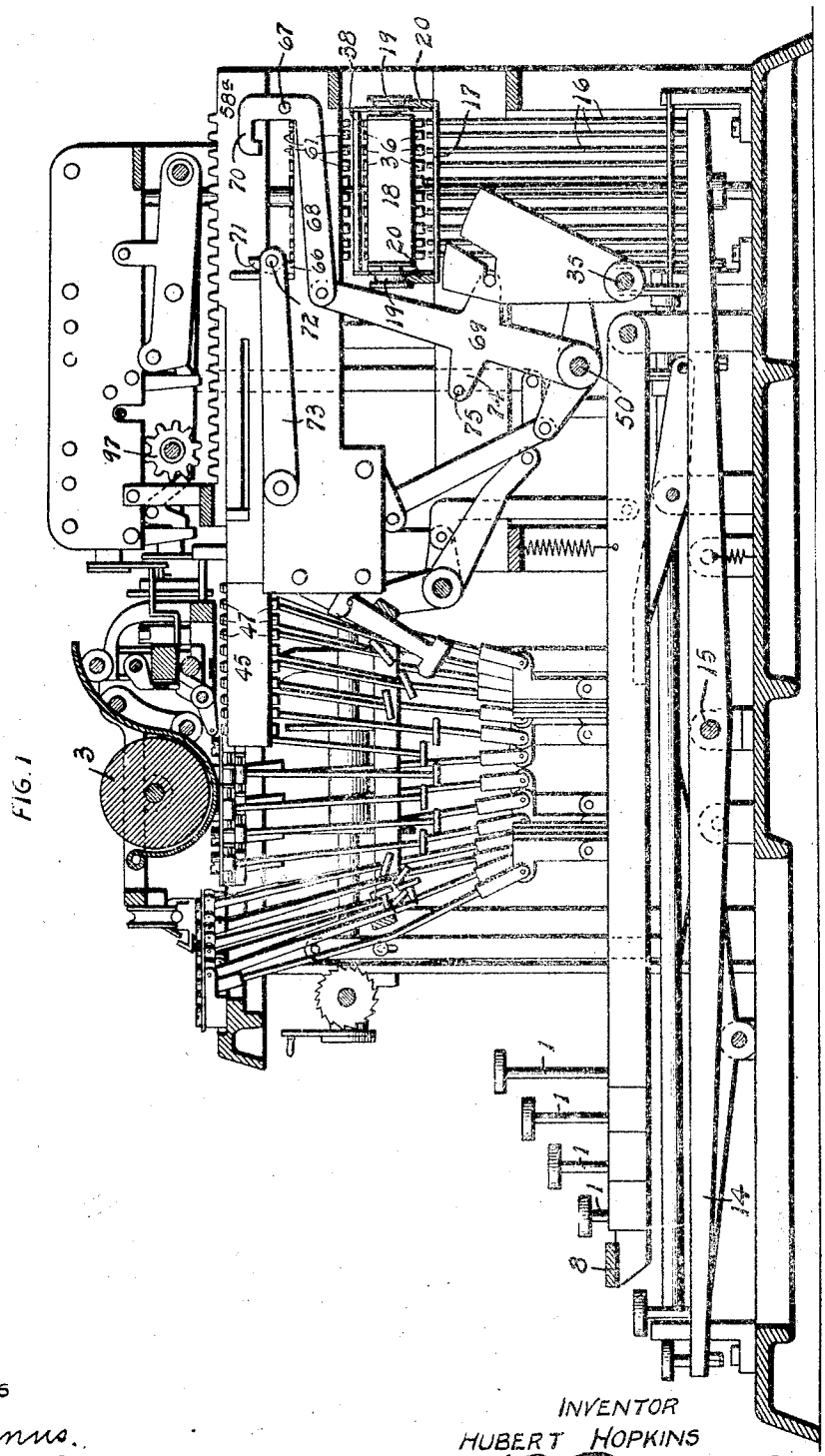


FIG. 1

WITNESSES

Wm. Janus.

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3 SHEETS—SHEET 2.

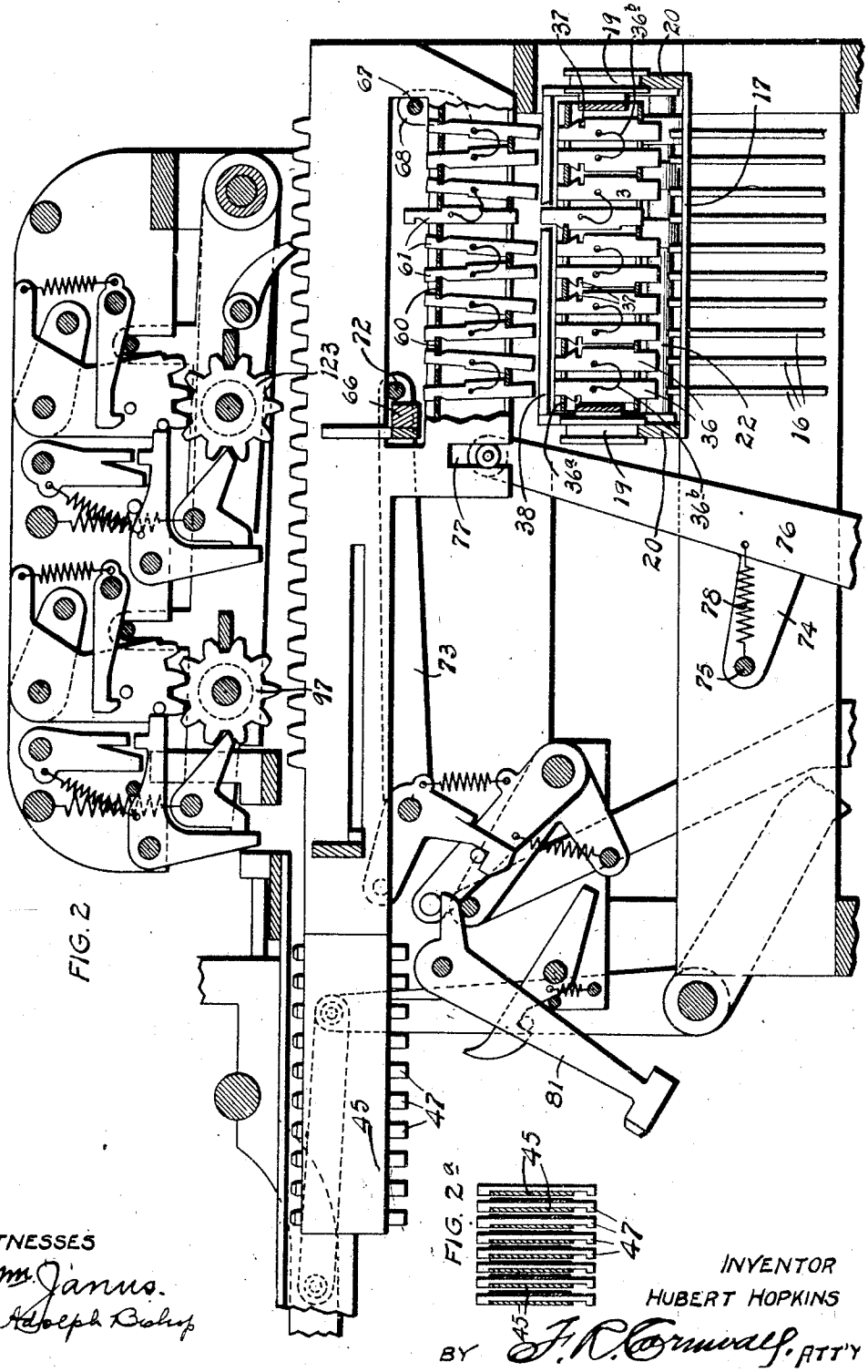


FIG. 2.

FIG. 2a.

WITNESSES

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3 SHEETS—SHEET 3.

FIG. 3

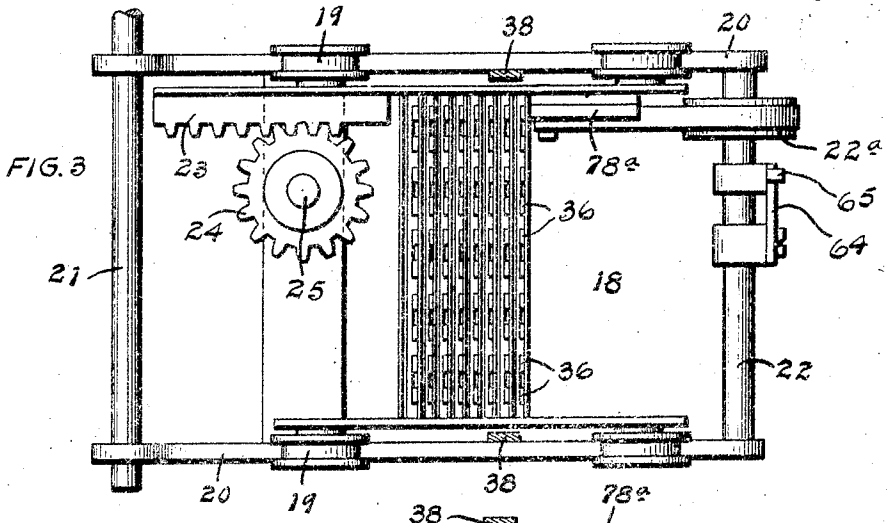


FIG. 4

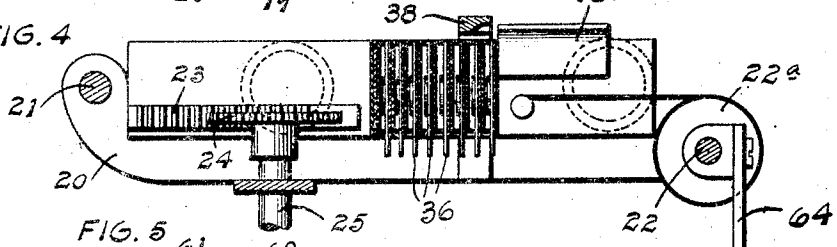


FIG. 5

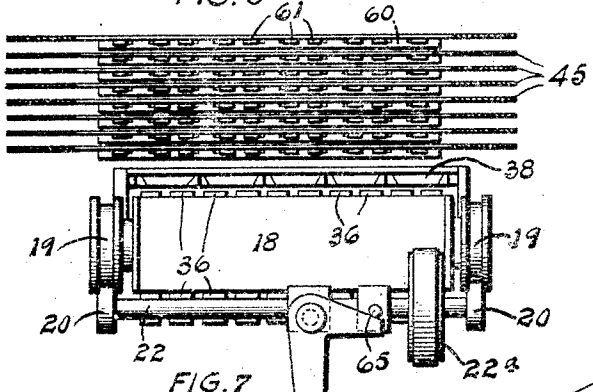


FIG. 6

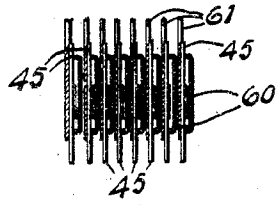


FIG. 7

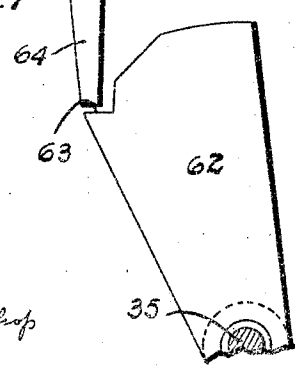
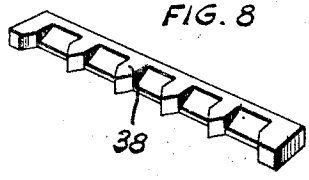


FIG. 8



WITNESSES

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UNITED STATES PATENT OFFICE.

HUBERT HOPKINS, OF ST. LOUIS, MISSOURI, ASSIGNOR TO MOON-HOPKINS BILLING MACHINE COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

CALCULATING-MACHINE.

1,178,073. Specification of Letters Patent. Patented Apr. 4, 1916.

Original application filed January 14, 1904, Serial No. 189,031. Divided and this application filed October 31, 1911. Serial No. 657,751.

To all whom it may concern:

Be it known that I, HUBERT HOPKINS, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Calculating-Machines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevational view partly in section of my improved calculating machine. Fig. 2 is an enlarged vertical sectional view through the upper rear portion of the machine. Fig. 2ª is a cross sectional view through the type carrying bars. Fig. 3 is a plan view of the traveling carriage. Fig. 4 is a vertical sectional view through said carriage. Fig. 5 is a plan view illustrating the stops on the type carriers. Fig. 6 is a cross sectional view showing said type carrier stops. Fig. 7 is a detailed view of a cam for lifting the traveling carriage. Fig. 8 is a detailed view of the bar for restoring the pins in the traveling carriage.

This invention relates to a new and useful improvement in calculating machines, and particularly to the means for controlling the type carrying racks from the key-board.

This application is a division of an application filed by me January 14th, 1904, Serial No. 189,031, and is a companion to an application filed by me April 6th, 1906, Serial No. 310,739, and which application 310,739 is a composite continuation of said application 189,031: and applications Nos. 225,758, filed September 24th, 1904, and 249,369, filed March 10th, 1905.

I shall not, in this application, describe the details of construction and method of operation on various parts illustrated in the drawings, and which, while coöperating with the subject-matter of this application, form no part hereof, as the same are fully disclosed in Belgium Patent No. 202,081, dated August 21st, 1907.

In the accompanying drawings: 1 indicates the keys of the typewriting mechanism, 3 is the platen for supporting paper to be printed upon, 8 is the space bar, and 14 are the levers of the adding mechanism provided with heads on their forward ends which are appropriately marked with digits according to the value of the keys, there being ten such digit keys. Key levers 14 are pivoted at 15, and each key lever coöperates with a vertical movable rod 16 at its rear end which rods are guided by plates 17.

18 indicates the frame of a traveling carriage, on the sides of which are flanged wheels 19, running upon a track frame 20 pivoted upon a rod 21. A cross bar 22 is arranged at the free end of this track frame and provides a mount for a spring drum 22ª, whereby the carriage is constantly pulled toward the left looking from the front of the machine, or toward the right looking from the rear of the machine, as shown in Fig. 4. This traveling carriage 18 carries a rack 23 meshing with a pinion 24 mounted on the upper end of a vertical shaft 25, which shaft is controlled by an escapement mechanism in the manner disclosed in my Belgium patent aforesaid, whereby upon depression of any one of the digit keys, the carriage moves leftwardly a distance of one step.

36 indicates pins mounted in the carriage in longitudinal series, said pins having notches 37 in their upper edges which notches are designed to lock the pins in their elevated position by engaging a projection 36ª. The restoring bar 38 is stationarily mounted above the carriage, said bar being provided with laterally inclined faces 38ª and downwardly inclined faces 38ᵇ (see Fig. 8) so that when the carriage is moved toward the right against the action of the spring pins 36 which have been raised, will be returned to their normal position. The pins 36 are arranged in pairs, each pair being coupled together by a U-shaped spring 36ᵇ, whereby the pins of a pair are held in their raised and lowered positions.

45 indicates type carriers having teeth on their rear upper edges for engaging and operating sets of adding wheels 97 and 123. I shall not describe the means for throwing

these adding wheels into and out of mesh with the racks, nor the carrying mechanism coöperating therewith, as the same forms no part of my present invention, and substantially the same mechanism is disclosed in my Belgium patent aforesaid. The forward ends of the rack carriers carry type 47 with which coöperate printing hammers 81, but as these are described in my Belgium patent, I shall not give the detailed description of the same here. Each type carrier is provided with a slot 77 near its rear end with which coöperates a lever 76, each lever being connected to a spring 78 in turn connected to an operating bar 75 carried by side frames 69, see Fig. 1. The upper ends of side frames 69 carry plates 68 between which is mounted a rod 67, the rear end of one of said plates having an overhanging projection 70, whose function will hereinafter be described.

61 are stop pins mounted in the rear lower edges of the type carriers, said stop pins being held in position by means of a housing plate 60 constituting a guiding frame for said pins. These pins are coupled together in pairs by U-shaped springs in the manner before described with respect to pins 36. There are ten stop pins 61 carried by the type carrier, and in order to prevent accidental movement their upper edges are notched to engage the plates 60. The number of rows of pins 36 is the same as the number of type carriers, and the first step of the carriage 18 incident to the operation of one of the digit keys is toward the left, thus bringing the first row of the pins 36 under the units type carrier, each step leftward moving the first row of the pins 36 under type carriers of higher denomination. When a number has been set up on a keyboard the pins 61 and 36 are in vertical alinement, so that when the carriage 18 is raised the key positioned pins will lift the corresponding pins 61. The carriage is raised immediately upon the movement of the operating shaft 35 by means of a cam 62, see Fig. 7, which engages the lower end of a pawl or lever 64 pivoted to the rod 22 of the track 20. Lever 64 is held against forward movement by pin 65, so that the initial forward movement of cam 62 will lift the frame but the continued forward movement of said cam carries the shoulder 63 from under 64 whereupon track 20 and carriage 18 drop to their normal position and the latter is then drawn back to its place at the right through the mechanism operating through the pinion 24 and rack 23 not herein disclosed, but which is disclosed in said Belgium patent. This restoration of the carriage occurs just before the main shaft 35 rocks rearwardly, so that the time required for backward travel of said rock shaft may be utilized by the operator in potentially setting up another number on the key-board.

The pins 61 which are raised, serve as stops for the type carriers which support them, so that the number struck on the key-board will be recorded by the operation of the type carriers and associated mechanism. The stationary bar 66 is supported over the frames 60 so that the pins 61 when not raised or set can pass thereunder, but the pins which are raised by the elevation of the carriage will be arrested by said bar, and thereby arrest the type carriers in position to record and register the required number. All the type carriers are normally held in alinement by a cross rod 67, which also serves to restore them to normal position. The rod 67 is carried by the plates 68 before referred to, whose forward ends are pivoted to the vertical lever 69 attached to the rock shaft 50, and which are swung forward when said shaft is rocked. The overhanging projection 70 on one of the plates 68 while in its forward position, engages a lug 71 on a rod 72 just behind the cross bar 66, and when the plate 68 starts rearwardly will push the rod 72 downward so as to restore all of the stops 61 which have been raised and which, at the time of depression of the rod 72 are directly under said rod. Rod 72 is carried by links 73 pivoted to the frame, and is normally held elevated by means of a spring 73^a.

The levers 69 have arms 74 extending forward and carrying a rod 75. Pivotally mounted upon the shaft 50 is a number of levers 76, one for each type carrier and bar 58, and said levers extend upward alongside of the carriers and bars and have lateral projections which operate in slots 77, Fig. 2, so that when any one of said levers is drawn forward the corresponding type carriers 45 or bars 58^a will be pushed forward. Said levers are independently movable and are each connected with the rod 75 by a spring 78, so that forward movement of the levers 69 will draw forward such of the levers 76 whose type carriers or bars 58^a are to operate. This results in bringing the stops 61 which had been set up, against the bar 66 thereby registering the number represented as before described. A projecting piece 78^a is carried by the carriage 18 just to the left of the first row of pins 36 in such position that when the carriage is raised as described, the foremost stop 61 on each type carrier, except on the carriers whose stops are operated by one of the pins 36, will be raised, and therefore all the type carriers to the left of those used to record the number will be held stationary, because the foremost stops are against the rear side of the bar 66.

When the shaft 35 rocks rearwardly, such

of the type carriers as have been positioned forwardly, as before described, will be restored by the bar 67 engaging the rear wall of the slot in said type carriers in which it operates.

I am aware that minor changes may be made in construction arrangement and combination of the several parts of my device without in the least departing from the nature of the principles of my invention, as it is obvious that my invention is readily combinable in any machine of the cross carriage type, without destroying the fundamental principles of such machine.

What I claim is:

1. The combination with the type carriers, and the stops carried thereby, of mechanism for positioning any of said stops and an abutment against which said stops engage when said type carriers move.

2. The combination with the type carriers, the platen, and the printing hammers, of a series of stops on each type carrier, mechanism operable to position said stops and an abutment whereby the stops positioned as aforesaid will stop movement of said type carriers.

3. The combination with a series of type carriers, a series of stops carried by each type carrier, and means for holding paper adjacent to the type carriers, of keys, and devices operated by the keys for moving the stops on the type carriers.

4. The combination with adding mechanism, and type carriers operable to record numbers, of a series of stops on each type carrier, and key controlled devices for positioning any desired stops to limit movement of said type carriers.

5. The combination with the type carriers, and the stops carried thereby, of key operated parts for moving said stops.

6. The combination with the type carriers, and the stops carried thereby, of keys, and devices adjustable by said keys to position any of said stops.

7. The combination with the type carriers, and the stops carried thereby, of a movable carriage, and devices in said carriage for positioning any of said stops to limit movement of the type carriers.

8. The combination with the type carriers, and hammers for driving the type to record, of a series of stops on each type carrier, and key controlled devices for moving any of said stops.

9. The combination with the type carriers, printing hammers, and adding mechanism, of parts carried by said type carriers, a carriage for operating said parts to set up numbers to be added and printed, and means for restoring said parts to idle position.

10. The combination with a series of type carriers, type on said type carriers, a carriage and mechanism operable to cause said carriage to set up numbers on said type carriers, of means for causing said type to record said numbers.

11. The combination with the type carriers, and the stops thereon, of a carriage, and key actuated devices in said carriage operable to move said stops to represent numbers.

12. A platen, a series of type carriers, and a series of hammers operable to drive the type of record on paper held by said platen, in combination with a series of movable stops carried by each type carrier, a carriage, and devices in said carriage operable effectively to position any desired stops.

13. A platen arranged to hold paper, a series of type carriers, and hammers operable to drive the type to record on paper held by said platen, in combination with a series of movable stops carried by each type carrier, a carriage, devices in said carriage operable effectively to position any desired stops, and keys operable to position said devices.

14. A series of type carriers, a platen, hammers for driving the type toward said platen, stops on the type carriers, means for positioning any of said stops as described, means for operating said type carriers after said stops have been positioned and an abutment for said stops.

15. A series of type carriers, a platen, hammers for driving the type toward said platen, racks connected with said type carriers, stops on said racks, means for setting any of said stops, means for operating said type carriers and racks after said stops have been set, and an abutment for said stops.

16. Recording mechanism comprising a platen, type carriers, means for operating said type carriers, a carriage determining which of said type carriers may be operated, stops carried by said type carriers, means for setting selected ones of said stops when said carriage operates, and hammers operable to drive the type to record.

17. Recording mechanism comprising a platen, type carriers operable toward and away from said platen, movable pins carried by said type carriers, a carriage, means in said carriage for setting selected ones of said pins, means for operating said carriage effectively to set said pins, an abutment for said pins, means for operating said type carriers, and hammers for driving the type to print.

18. In an adding machine, mechanism for recording the numbers to be added comprising a series of carriers, a series of type mounted on each carrier, a series of movable stops mounted on each carrier, a carriage, means for operating said carriage, means in

said carriage for setting selected ones of said stops, means for operating said carriers, a platen arranged to feed paper to said carriers, and hammers operable to drive the type to print on paper on said platen.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this 24th day of October, 1911.

HUBERT HOPKINS.

Witnesses:

M. P. SMITH,

LILY ROST.