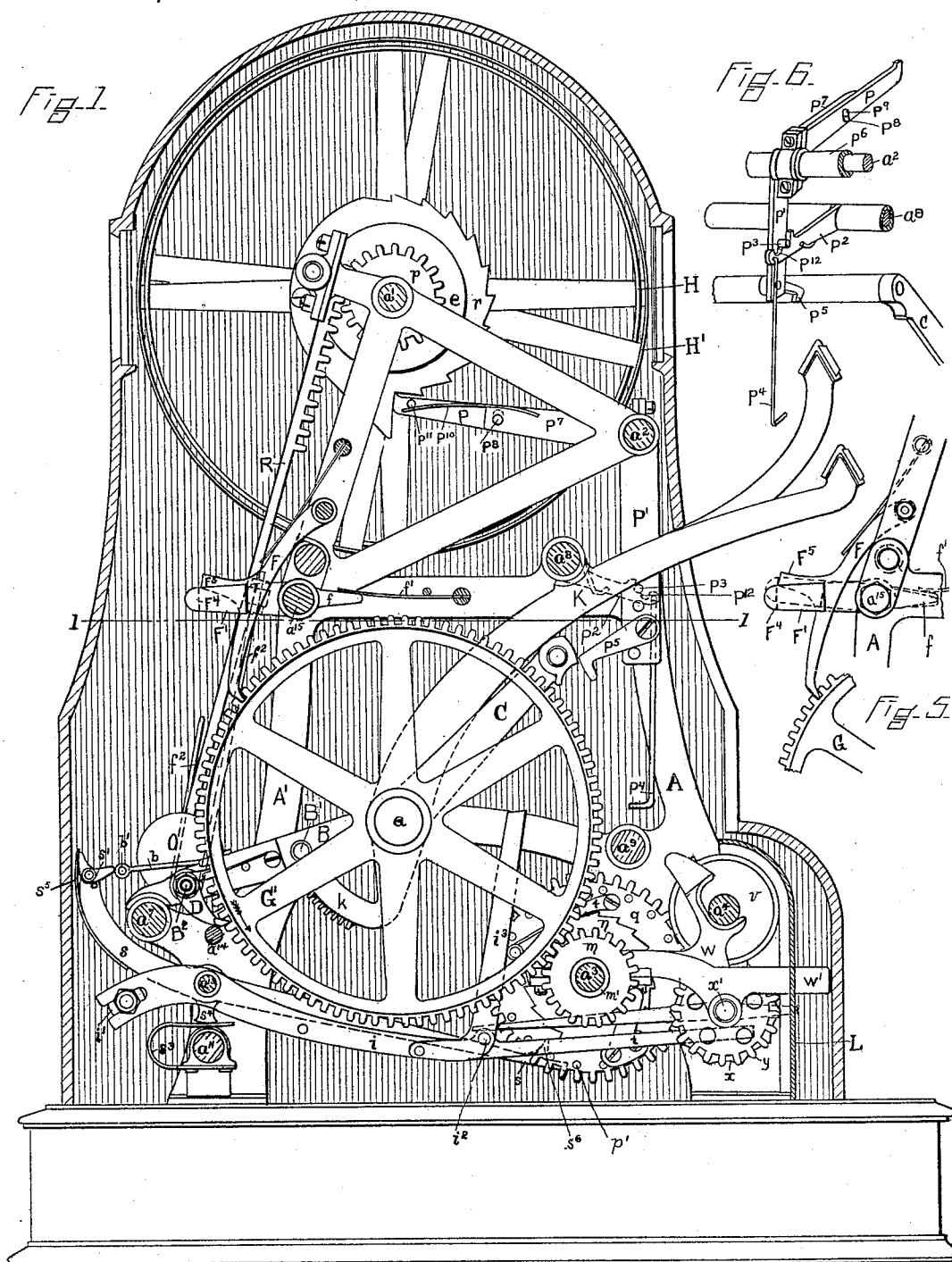


2 Sheets—Sheet 1.

No. 486,979.

Patented Nov. 29, 1892.



Howard L. Hoburn.
E. A. Webster.

Charles Carr

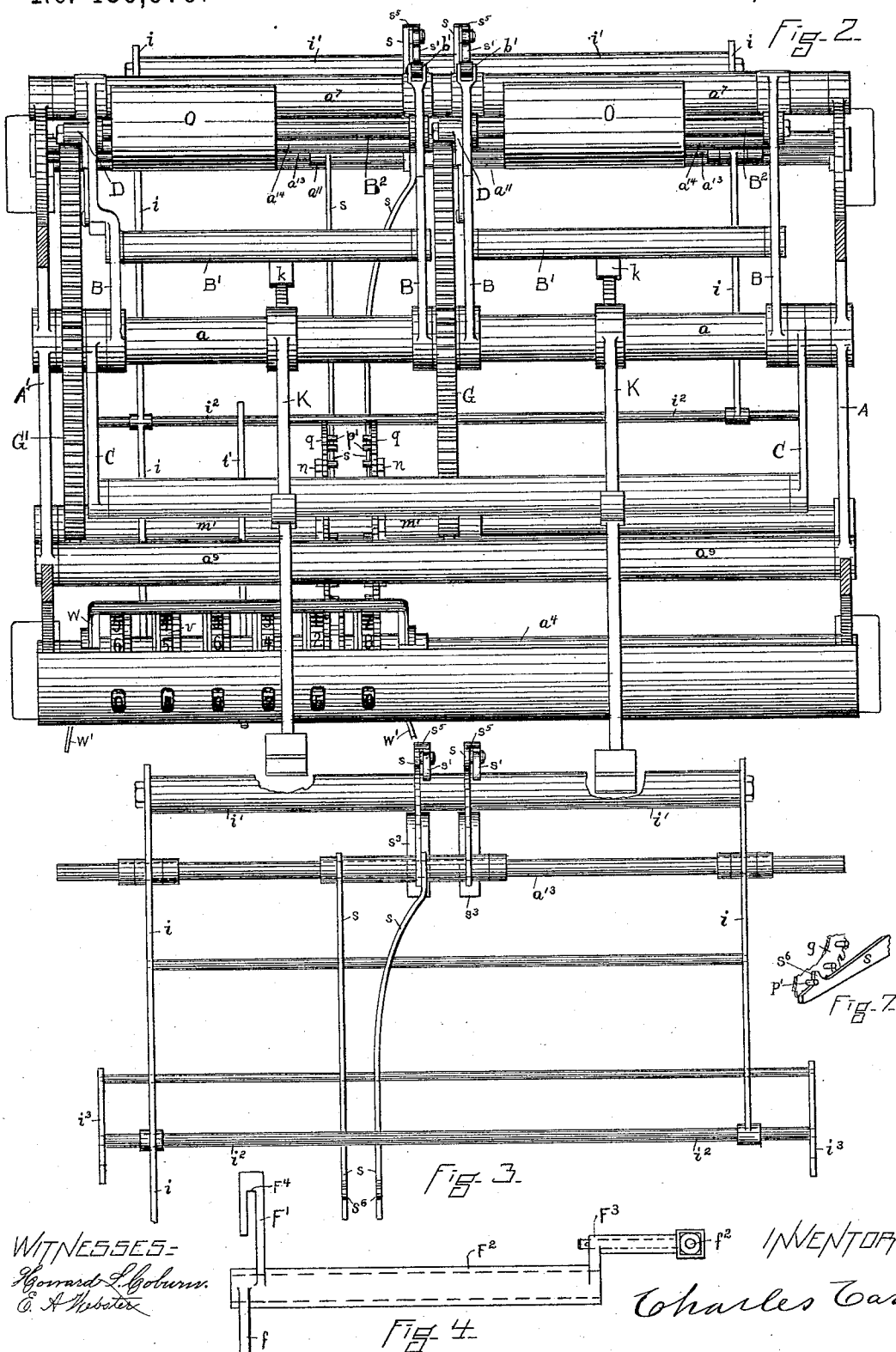
(No Model.)

2 Sheets—Sheet 2.

C. CARR.
CASH REGISTER AND INDICATOR.

No. 486,979.

Patented Nov. 29, 1892.



WITNESSES:
Howard L. Johnson.
C. A. Webster.

INVENTOR,
Charles Carr

UNITED STATES PATENT OFFICE.

CHARLES CARR, OF BOSTON, MASSACHUSETTS.

CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 486,979, dated November 29, 1892.

Application filed February 15, 1892. Serial No. 421,618. (No model.)

To all whom it may concern:

Be it known that I, CHARLES CARR, a citizen of the United States, residing at Boston, county of Suffolk, and State of Massachusetts, have invented certain new and useful Improvements in Cash Registers and Indicators, of which the following, together with the accompanying drawings, having reference-letters herein referred to, is a full and exact description.

The nature of my invention relates to various devices designed to render more certain the correct indication of the various transactions and the correct registration of the totals thereof. These devices are shown as applied to the machine more fully shown and described in Letters Patent Nos. 468,329 and 468,330, issued February 9, 1892, to Charles Carr, for improvements in cash registers and indicators; but they may be applied to any machine having similarly-related operative mechanism and registering-wheels.

Referring to the drawings, Figure 1 is a sectional end elevation of the above-named machine with my improvements embodied therein, the section being taken just within and parallel to the left-hand end frame A. Fig. 2 is a sectional plan of the machine and stop devices, the section being taken at line 1 1, Fig. 1. Fig. 3 is a plan of the stop device removed from the machine proper. Fig. 4 is a detail view of the locking-hook F'. Fig. 5 is a detail view of pawl F and locking-hook F', showing their various relative positions. Fig. 6 is a perspective view of the device for holding the retaining-pawls P out of action. Fig. 7 is a detail view showing the tooth s^6 and its relation to the pin p' in gear q .

In the machine illustrated the adding or registering mechanism is operated by force of springs or weights acting upon the driving mechanism after said weights or springs and the driving parts have been set by the action of the finger-levers. Said parts and the operation of them are as follows: Finger-levers K, Fig. 1, being levers of the first order, are provided and pivoted at a , the inner and lower ends being formed into tappets k , each tappet varying from its neighbors in length in proportion to the numerical value of the keys.

As is common to machines of this class, the keys are arranged in groups, each group representing a different decimal place. One key of each group is shown in Fig. 2. Each group is spanned by a bail or yoke B, pivoted at a and consisting of arms B and cross-bars B' and B², the cross-bars B' being in the path of the tappets k . (See Fig. 1.) Pivoted upon cross-bars B² are rack-bars R, which serve to operate the indicating-wheels H and H'. The construction and arrangement of these wheels may be varied, and they are therefore not described here. Also pivoted on bars B² are the driving-pawls D, one of which acts against each of the large gears G and G', said gears G and G' being pivoted, also, at a , the former just to the left of the right-hand frame B and the latter at the left of the left-hand frame B, as will be readily seen by reference to Fig. 2.

The adding mechanism shown at the bottom and right of Fig. 1 and in Fig. 2 consists of the numeral-wheels v , each with a gear attached to it, and the Geneva-stop transmitting device $x y$. Any similar or suitable adding mechanism may be substituted for this. The motion of the gears G and G' is transmitted to the adding device by means of gears m , meshing with gears G and G', and ratchets n , mounted and fixed on the extended hubs m' of gears m . Idler-gears q are also mounted upon the same shaft as gears m and, besides ratchets n and pawls t upon gears q , act against the teeth of ratchets n . Thus when the gears G and G' are turned in the direction of the arrow, Fig. 1, the gears m and ratchets n are turned by them, and the gears q are turned by the action of pawls t on ratchets n . The gears q mesh each with a suitable and corresponding wheel of the adding mechanism. Since the wheels of the adding mechanism are necessarily connected by some transmitting mechanism and since the motion of the first wheel must be transmitted to the next, even though the driving mechanism corresponding to the second is not operated, it is evident that the gearing must somewhere consist of a device which shall be all driven if the power is applied to one end of the train, but must allow that portion immediately con-

nected with the adding mechanism to operate separately from the rest if the power is applied at that portion of the device. Hence the use of the "one-way" ratchets n and pawls t .
 5 It is now evident that if any of the keys K are depressed the bail B corresponding will be raised a distance varying with the length of tappets k , and the pawls D , slipping over gears G and G' , will engage with a number of teeth
 10 proportional to the numerical value of the keys. Consequently upon the return of the keys the bails B and pawls D return to their normal position by force of weights O or springs, turning gears G and G' and the adding mechanism. The momentum acquired
 15 by the various wheels sometimes would cause incorrect or incomplete registration if not in some way overcome; and the object of a portion of my present invention is to make a
 20 positive stop for the wheels, thus counteracting the effect of the momentum. When the bails B are at rest in their normal position, the rear ends resting on the stop-bar a^7 , the pawls D hang in the position shown in Fig. 1.
 25 A locking-rod a^{14} extends across the machine in such a position as to prevent the pawls D from swinging out of the teeth of gears G and G' while the bails and pawls are in said normal position, but permits the free action of
 30 the pawls the moment the bail begins to rise under force of the keys. It will be readily seen that this forms a positive lock for the gears while the bails are at rest, thus overcoming the effects of momentum on the gears.
 35 It will be readily seen that were the gears G and G' directly connected by gears to the adding-wheels the device just described would be sufficient to stop all of the gears; but because of the intervention of ratchets n
 40 and pawls t it is apparent that the momentum might cause gears q and the adding-wheels to turn even after gears G and G' and pinions m are stopped. To avoid this, the device shown in Figs. 1 and 3 and marked by letters
 45 i s s' , &c., is introduced. The operation of this device is as follows: Stop-levers s , having tubular bearings on shaft a^{13} , each have a tooth s^6 (see Fig. 7) on the front end and a trigger s' , controlled by a spring s^5 , on the
 50 rear end. The gears q have stop-pins p' in the side extending into the plane of tooth s^6 . (See Fig. 2.) The bails B carry fixed to them the arms b , having a roller b' on the outer end. A rocking frame C is pivoted at a and
 55 is operated by the keys, as will be readily understood. Pivoted at a^{18} is a frame i , consisting of arms, counterweight i' , cross-bar i^2 , and fingers i^3 , the cross-bar i^2 extending across and above the stop-levers s . When
 60 the keys are depressed, the frame C strikes the fingers i^3 , depressing the frame i , the cross-bar i^2 of which pushes down the inner end of the stop-levers s , freeing the teeth s^6 from the pins p' . On the return of the keys
 65 and frame the counterweight i' tilts the frame i , raising the cross-bar i^2 and leaving the

stop-levers free. Now when the keys are depressed the bails B and the arms b are raised, and as the keys return the bails B drop by force of weights O or springs, turning
 70 gears G and G' , and as they near the bottom of their stroke the rollers b' strike the triggers s' , causing the stop-levers s to turn on shaft a^{13} and bring the teeth s^6 into the path
 75 of the pins p' in gears q , the mechanism being so timed that the teeth s^6 catch the pins p , which correspond to the desired position of the numeral-wheels.

Numerous mechanical variations of this device can be made without departing from the
 80 spirit of the invention. The stop-levers s may be held in the various positions desired by friction on shaft a^{13} or the friction of a spring—such as s^3 —against an arm s^4 , formed
 85 on the lever s , or by a variety of similar devices. It will be readily seen that if both of the bails B after being raised are allowed to drop at the same time two gears of the adding mechanism would be turned at the same
 90 time, which might cause incorrect registration, as if the second wheel of the adding mechanism is turning at such a time as the first wheel is in a position to "carry" the carrying could not be effected. To avoid this
 95 difficulty, a pawl F is pivoted on the frame of the machine in such a position that it acts as a retaining-pawl to prevent the turning of gear G while the bail B is being raised. This will be readily understood on reference to
 100 Figs. 1 and 5. Now upon a longitudinal shaft a^{15} , Figs. 1 and 5, is pivoted a locking-hook F' , having a tubular bearing F^2 , an arm F^3 , and a second arm f . (Shown in detail in Fig. 4.) Attached to the arm F^3 is a link f^2 , through which passes the cross-bar B^2 of the
 105 right-hand bail B . This link is adjusted to such a length that when the bail B is in its lowest or normal position the hook F' is held in the position shown in Fig. 1 and by the full lines in Fig. 5. A spring f' , acting on
 110 arm f , tends to lift the hook F' to the position shown by the dotted lines in Fig. 5. The pawl F passes down through the hook F' , and said pawl has an arm F^5 formed thereon in such a position that when the hook F' is pulled down
 115 the pawl F is free to swing on its pivot, but when raised the face F^4 of the hook is brought into the path of the arm F^5 , locking the pawl into gear G , and thus preventing its turning in either direction. Now if both bails are
 120 raised at the same time the first or right-hand one is free to drop as soon as the keys are released, but the second bail cannot drop until gear G is released by the action of cross-bar
 125 B^2 and link f^2 on hook F' , thus allowing one bail to complete its action before the other can commence.

The indicating-wheels H and H' (shown only in Fig. 1) may be of any style and arrangement, turning upon shaft a' and propelled by
 130 the action of rack R upon pinion p . Any suitable device may connect pinion p to the wheels,

so that it shall turn said wheels only on the upward movement of rack R. The wheels are retained in their indicating position by means of ratchets r , affixed thereto and acting against pawls P, pivoted on hub P^6 on shaft a^2 . The wheels are returned to their normal position by force of springs, weights, or any suitable device after being released from pawls P. This releasing is accomplished by the action of the bail C upon a trigger P^5 , pivoted upon an arm P^7 , pendent from a hub P^6 , pivoted upon a^2 . This hub P^6 has arms P^7 projecting inwardly beside pawls P and so arranged and connected thereto that when the bail C is pulled down the trigger P^5 is forced outward, turning hub P^6 and arms P^7 and depressing pawls P. As shown, this connection consists of a pin P^8 in arm P^7 , projecting through a slotted hole P^9 in pawl P, and a spring P^{10} , attached to arm P^7 , acting against a pin P^{11} in pawl P to keep the bottom of the slotted hole P^9 against the pin P^8 . (See Figs. 1 and 6.) This arrangement permits the pawls P, of which there is one for each wheel, to be depressed independently of one another by the action of the ratchets r upon them; but all are depressed at once by the action of bail C upon trigger P^5 , arm P^7 , hub P^6 , and arm P^7 . Now it is desirable that the pawls P should be held out of the ratchets r for a sufficient length of time to allow the wheels H and H' to return to their normal position. To accomplish this a notched pawl P^2 (see Figs. 1 and 6) is pivoted upon shaft a^8 , and a pin P^3 in arm P' acts in and with notch P^{12} in said pawl. A hook P^4 hangs from pawl P^2 with the hook end in the path of bail C. When the arm P' is forced outward, the pawl P^2 is forced by a spring to engage the pin P^3 and hold the arm P' , and consequently the pawls P, out of working position until the bail C as it nears the end of its stroke strikes the hook P^4 and pulls downward the pawl P^2 , releasing the arm P' and pawls P.

Having thus described my invention, what I claim is—

1. In a registering-machine, the combination of the main first-moving gear, the levers K, the bail B, having the positive stop-bar a^7 and having pivoted to it the driving-pawl D, whose driving movement with the bail is positively limited by and at said stop-bar, the said pawl, and the locking-rod a^{14} , located beyond and out of contact with the pawl in its driving movement, but in a position near its back, where it prevents the pawl at the end of and after its driving motion from swinging out of engagement with the teeth of the gear, substantially as and for the purpose set forth.

2. In a registering-machine in which a one-way driving mechanism is introduced between the main driving-wheel and the driven wheel of the adding mechanism, the combination of the automatic operative mechanism for the driving-wheel, said driving-wheel, the

adding mechanism, and the intermediate connecting mechanism, with a stop device for the adding mechanism, which is alternately thrown out of and into action by said operative mechanism to first allow the adding mechanism to operate and then to furnish a positive stop therefor when it has reached the desired position, substantially as set forth.

3. The combination of keys K, tappets k , bail B, pawl D, gear G, pinion m , ratchet n , pawl t , gear q , having pins p' therein, and said pins p' , with a stop device which by the action of bail B is forced into action with pins p' , serving to stop gear q and related parts, substantially as described.

4. The combination of keys K, tappets k , bail B, pawl D, gear G, pinion m , ratchet n , pawl t , gear q , the pins p' , and a stop device operated by said bail B to act with pins p' to stop gear q positively with a releasing mechanism operated by the keys to force said stop device away from pins p' , allowing a movement of gear q , substantially as set forth.

5. The combination of keys K, tappets k , bail B, pawl D, gear G, pinion m , ratchet n , pawl t , gear q with trigger s' , lever s , tooth s^6 , and pins p' , substantially as and for the purpose set forth.

6. The combination of keys K, frame C, tilting frame i , fingers i^3 , and cross-bar i' with stop-levers s , substantially as and for the purpose specified.

7. In a registering-machine having groups of keys, each group representing a different decimal place and each setting suitable automatic operative mechanism for a distinct wheel of a registering mechanism, the action of which wheel if it corresponds to a higher group is permissible only while the operative mechanism of the next lower group is at the normal position, the combination of the keys, operative mechanism, and adding-wheel of a higher group, a pawl acting with said wheel, a locking device for holding said pawl into said wheel to prevent its turning, the operative mechanism of the next lower group, and suitable connecting mechanism whereby the action of the higher wheel is allowed only when the said pawl is unlocked by the action of the operative mechanism of the lower group, substantially as set forth.

8. The combination of keys K, bail B, and gear G' of a higher group with pawl F, arm F^5 , hook F' , its extended hub F^2 , arm f on hub F^2 , link f^2 , and bail B of a lower group of keys, substantially as and for the purpose set forth.

9. In an indicating-machine in which the indicating-wheels are held in indicating position by independent pawls, said pawls having a common key-operated tripping device, the combination of said wheels, pawls, and tripping device with a catch device which through the medium of the tripping device serves to catch and hold said pawls out of working position during the first and larger portion of

the forward stroke of the keys and then releases said pawls, allowing them to act during the remainder of the forward and the whole of the backward stroke, substantially as described.

10. The combination of wheels H and H', ratchets r, pawls P, arms P', pins P³, hub P⁶,

arm P', trigger P⁵, bail C, pin P³, catch P², hook P⁴, and the keys, substantially as and for the purpose set forth.

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Witnesses:

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F. M. HOOPER.