W. H. SLOCUM.

Type-Writing Machine.

No. 215,251. Patented May 13, 1879.

Figure 1

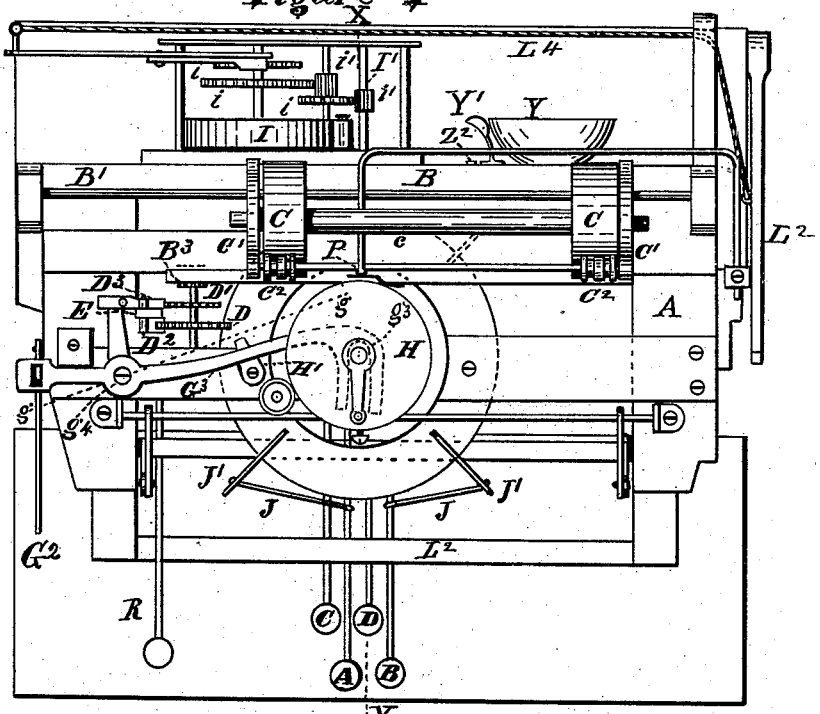

Figure 2

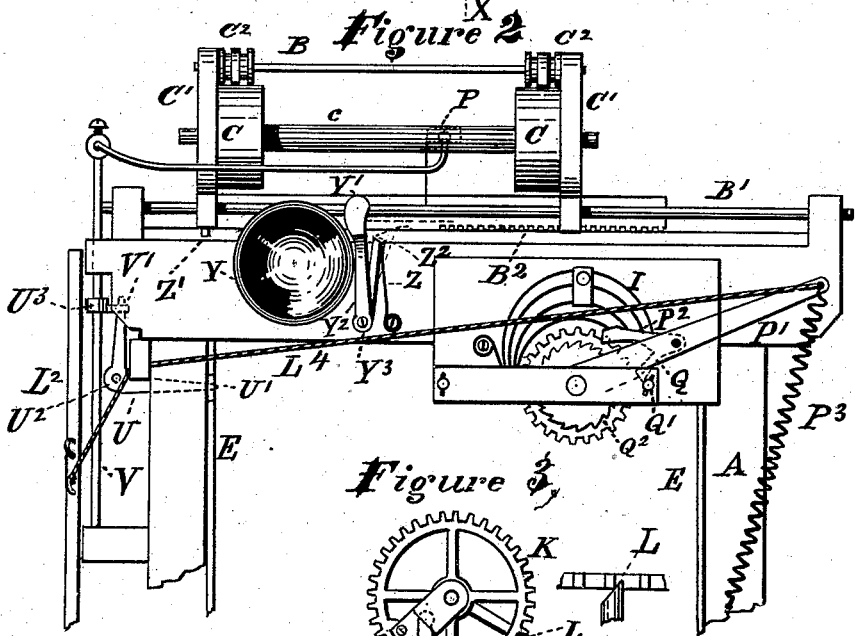

Figure 3

Witnesses

Sidney B. King

Daniel W. Curtis

Inventor.

William H. Slocum,

By James Langster

Atty.

W. H. SLOCUM.

Type-Writing Machine.

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Figure 4.

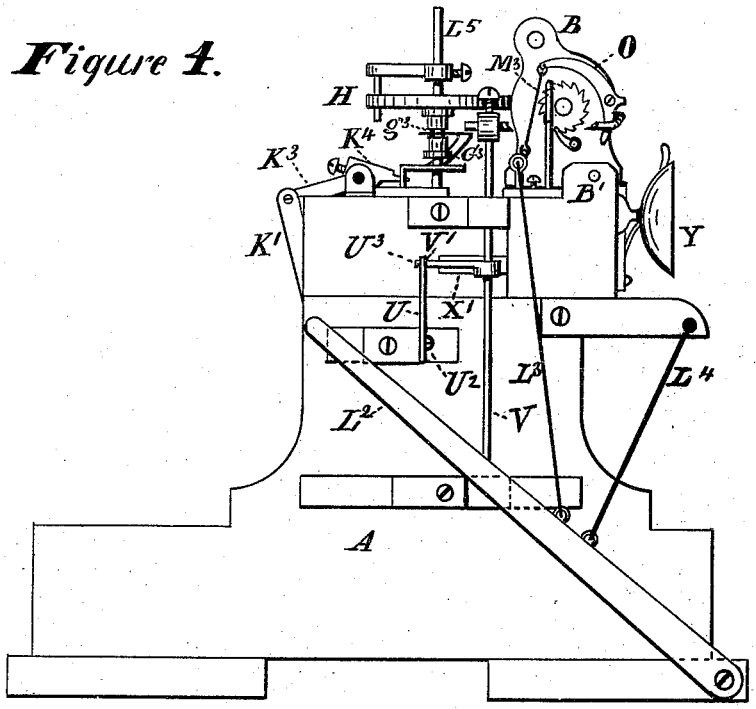
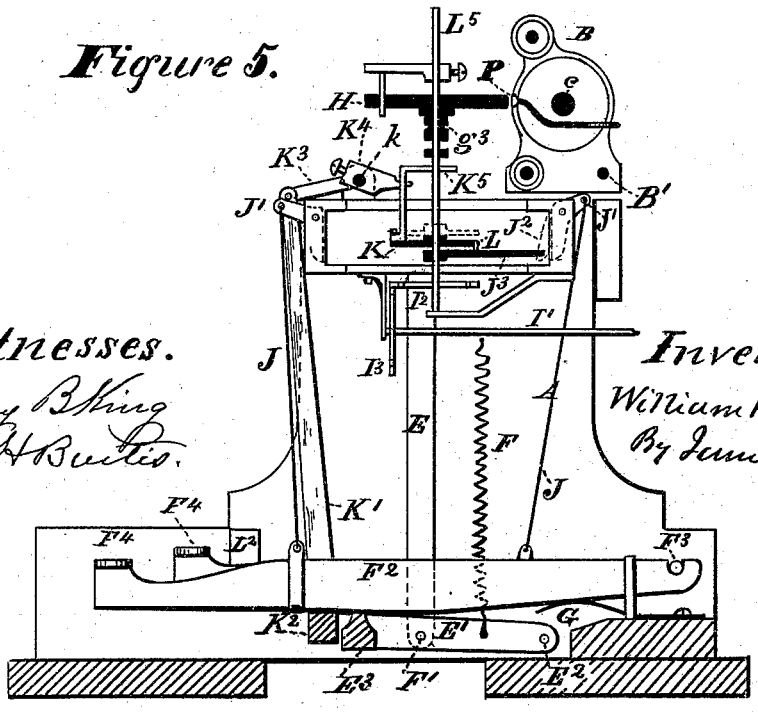


Figure 5.



Witnesses.

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Type-Writing Machine.

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Figure 6

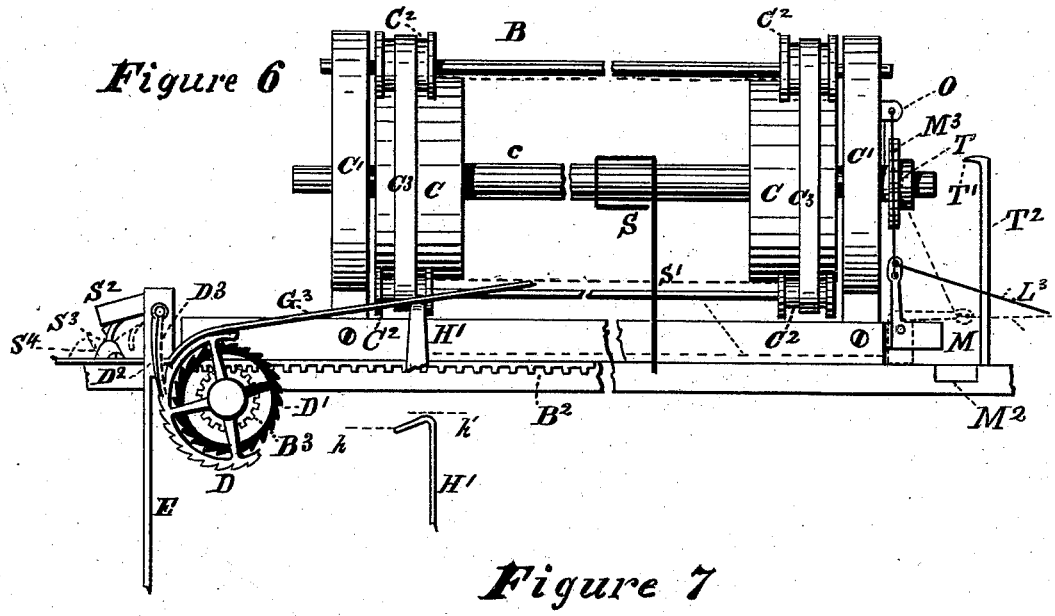

Figure 7

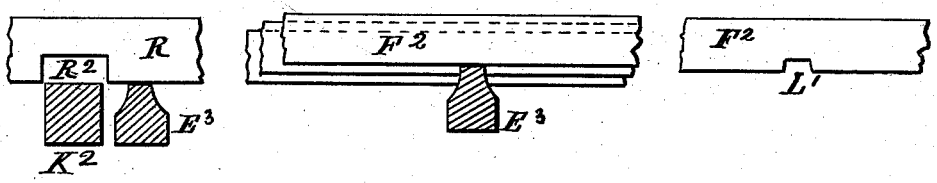

Figure 8

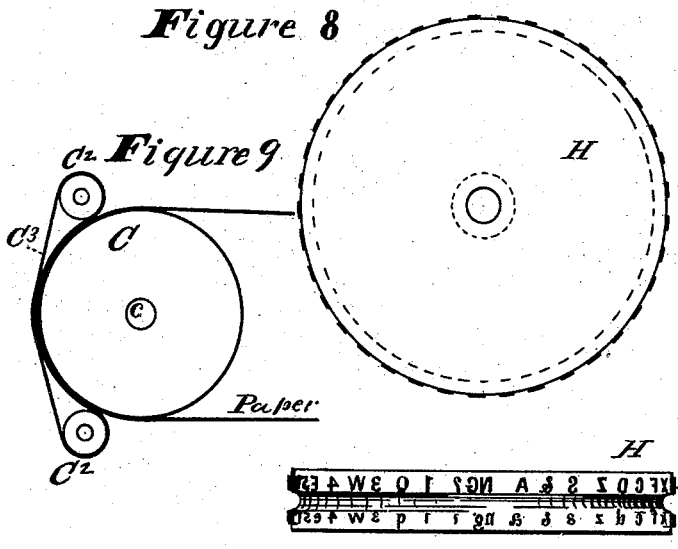

Figure 9

Witnesses.

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David S. Bates

Inventor.

William H. Slocum

By James Langster

Atty.

UNITED STATES PATENT OFFICE.

WILLIAM H. SLOCUM, OF BUFFALO, NEW YORK.

IMPROVEMENT IN TYPE-WRITING MACHINES.

Specification forming part of Letters Patent No. **215,251**, dated May 13, 1879; application filed November 29, 1878.

To all whom it may concern:

Be it known that I, WILLIAM H. SLOCUM, of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Type-Writers, which improvements are fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a top or plan view of the machine complete; Fig. 2, a back view; Fig. 3, a detached plan of the locking-wheel. Fig. 4 is a side elevation of the machine. Fig. 5 is a vertical longitudinal section through line X, Fig. 1; Fig. 6, an enlarged side elevation of the carriage and mechanism for moving the paper-carriage and adjusting its spacing movement for either capitals or small letters; also, the mechanism for raising the carriage and returning it to the starting-point and leaving it. Fig. 7 is a detached view of a part of the key-levers, showing the arrangement of a part of the mechanism whereby the carriage is moved more or less, according to the space required for the letter to be printed, showing also a portion of the spacing-key. Fig. 8 represents an enlarged plan view of the type-wheel and a side elevation of the same; and Fig. 9 is a portion of the carriage, showing how the paper is held in place while being printed.

My invention relates to improvements in type-writing machines; and it consists, first, in a new and improved locking device for securely holding the type-wheel in position while printing; second, in mechanism for readily changing the position of the type-wheel for printing either capital or small letters; third, in the arrangement of the machinery for regulating the movement of the paper-carriage, whereby a greater space or movement is made for capitals than for small letters; fourth, in a type-writing machine, the mechanism hereinafter shown, or its equivalent, whereby a variable intermittent movement of the paper-carriage is made, so as to correspond with the width of the letter to be printed, or so the spacing movements of the carriage will vary as the width of the different letters, combinations of letters, and characters vary; fifth, in the arrangement and construction of the paper-carriage and the devices for holding the paper back from the type-wheel and ink until struck by the printing hammer or platen; also, in the construction of devices, to be more clearly hereinafter shown, whereby the paper-carriage is raised up sufficiently to disengage it from the gearing that gives the type-spacing movement and brought back to the starting-point, which movement winds up the mechanism for actuating the type-wheel, and causes the carriage to be lowered into position and give the necessary spacing movement to the paper for the lines of printing.

In said drawings, A represents the frame of the machine; B, the paper-carriage. It is held to the top of the machine by means of the rod B^1, along which it slides easily. B^2 is a rack attached to the lower front frame of the carriage, and is made to gear into the pinion B^3. (See Fig. 6.) C C represent two paper-holding pulleys or drums connected together by the shaft *c*, so as to turn easily in the frame C^1 of the carriage. The paper is held in position by means of the pulleys C C C^2 C^2 and belts C^3, as shown in Figs. 6 and 9.

The spacing movement of the carriage is given by means of the rack B^2, pinion B^3, gear or ratchet wheels D D^1, and pawls D^2 D^3, D^3 being in dotted lines in Fig. 6. (See also Fig. 1 in this connection.) The pawls are jointed to a bar, E. (See Figs. 1, 5, and 6.)

E^1 represents an arm, of which there are two, connected together by a shaft and to each side of the frame of the machine at a point shown by the letter E^2 in Fig. 5, so as to swing easily. Their opposite ends are rigidly fastened to a cross-bar, E^3, and to one of the arms E^1 is connected a spring, F, for holding them upward. The bar E is jointed to one of the arms E^1 at F^1.

The type-levers F^2 are held by a rod, F^3, as shown in Fig. 5, and are kept up by springs G, and toward the front end they rest on the cross-bar E^3. It is obvious that a pressure downward on the keys F^4 of any of the type-levers will cause a downward movement of the bar E, thereby moving the pawls D^2 D^3, and through the rack and pinion hereinbefore described give a spacing movement to the carriage.

When using small letters the large ratchet-wheel D and pawl D^2 are used, the pawl D^3 being out of gear when D^2 is operating. When

it is necessary to use capitals the smaller wheel D^1 and its pawl D^3 are thrown into gear by moving the lever G^2 upward, which causes the lever G^3 to move into the position shown in Fig. 1, (the dotted lines *g g* showing its position when small letters are used.) At the same time it shifts the type-wheel H vertically, so as to bring the capital letters in position for printing, the small letters g^1 and capitals g^2 being arranged as in the side elevation Fig. 8, or vice versa. It will make no difference whether the small letters are arranged above or below if the operating mechanism is made to correspond.

The arm G^3 is jointed at g^4, so as to vibrate, and is made of spring metal, or in any other equivalent way, so as to allow a vertical movement of the outer end, which is slotted, as shown in dotted lines, Fig. 1, so as to move easily in the groove g^3 in the hub of the type-wheel. (See also Figs. 4 and 5.) H′ is an arm having the upper part bent, as shown in the detached view, Fig. 6, so as to incline downward. As the arm G^3 is moved, as before mentioned, it is raised or lowered over the inclined end of H′, as shown by the dotted lines *h h′*, thereby raising or lowering the type-wheel.

The action of the type-wheel and its locking mechanism is as follows: In Fig. 1 I have shown an arrangement of gearing, *i i′*, operated by the spring I, so as to turn the shaft I^1, and by means of gearing I^2 I^3 (see Fig. 5) turn the type-wheel. When a type-key, F^4, is forced down the rod J (of which there is one for each type-key) will cause the arm J^1 to move, as shown by the dotted lines J^2, so that its lower end comes forward and stops the arm J^3, which has at the same time been released by the upward movement of the locking-wheel K, produced by the arms K^1, cross-bar K^2, arms K^3, shaft *k*, and arm K^4, the frame K^5 and the locking-wheel being made to move vertically up and down the shaft L^6. It will be seen that a pressure on any key (except the spacing-key, which will be hereinafter described) will move the cross-bar K^2 and arms K^1 down, and cause an upward movement of the locking-wheel by means of the arm K^4, which connects with the frame K^5, as shown. (See Fig. 5.) This releases the arm J^3 by moving the teeth of the locking-wheel away from the pin L on said arm. When the type-keys are released they spring up, and the locking-wheel moves down again and locks the arm and type-wheel in another notch, corresponding with the key and letter last used.

If desired, the locking-wheel may be arranged so as not to move vertically, and instead the arm K^4 may be made so that its outer end will drop into a notch in the wheel at the proper time.

The locking-wheel pin L on arm J^3 is beveled off on one side, as shown in the enlarged view to the right of Fig. 3, so as to allow the type-wheel arm J^3 to pass just by the arm J^1, at J^2, last used, so that should it be necessary to use the same letter twice in succession the type-wheel will revolve and re-ink the letter.

It is well known that different letters require different lengths of spaces. An I or a J would not need as much space as an L or an M would. To accomplish this, I cut out the key-levers more or less at the bottom, as shown at L^1 in the fragment of a lever in Fig. 7. All of said levers are forced up by a spring, G, to the same point against the stationary cross-bar L^2, (see Figs. 1 and 5,) so that the deeper the notch L^1 the shorter will be the movement of the cross-bar E^3, and, consequently, the spacing movement of the paper-carriage will be less.

I have shown larger teeth in the spacing-gear D D^1 than would be required in practice. The smaller the teeth are made and work well the better, and, if desired, a friction-wheel without teeth, combined with the usual gearing for such purposes, could be used, so that in the backward movement of the pawl the wheel would remain stationary, and in the forward movement gripe the wheel with sufficient force to move it and produce the proper space movement of the paper-carriage.

After the carriage has been moved a sufficent distance to print a line, and the spring I has run down in proportion to the number of turns the type-wheel has made, and it becomes necessary to disengage the rack from the pinion B^3 and return the paper-carriage to the starting-point, and while doing so, rewind the spring I, remove the printing-hammer away from the paper, and give the spacing movement for the lines.

I employ an arm or lever, L^2, by which I accomplish all these movements, by means of the cords L^3 L^4, or their equivalents, as follows: By moving L^2 forward, the cord L^3 draws the angular arm M, causing it to turn into the position shown by the dotted lines, and lifts the front of the paper-carriage so as to disengage the rack, and then draws it to the starting-point, when the end of the lever M drops into the depression M^2. (See Fig. 6, also Figs. 1 and 4.) As the carriage reaches the limit of its travel the ratchet-wheel T is brought with one of its teeth above the end T^1 of the standard T^2, and as the carriage drops, as before described, the said tooth, striking the end T^1, is turned, causing such a partial revolution of the paper-pulleys as will carry the paper to the position required for printing the next line. If desired, such movement may be made by clock-work, and the carriage may be made to return automatically.

These movements of the carriage further cause the connecting-arm M^3 to move the curved arm O, so that its lower end will force the printing-hammer P back away from the paper. (See Figs. 4 and 6.) At the same time the cord L^4 (see Fig. 2) draws the arm P^1 forward, so as to wind up the spring I, which has partly run down by operating the type-wheel while printing a line.

The pawl P^2 is formed so that its lower end,

Q, (shown in dotted lines,) will rest on the pin at Q^1 and hold it away from the ratchet-teeth Q^2 when the lever or arm P^1 is drawn back by the spring P^3, as in Fig. 2, so that the spring I can operate the type-wheel.

R represents a spacing-lever. (See Figs. 1 and 7.) It has an opening at the bottom R^2, so that when operating it will not move the cross-bar K^2, and consequently will operate the spacing mechanism without printing.

S represents a small frame supported by a standard, S′, for the purpose of keeping the paper away from the type-wheel until struck by the printing-hammer.

It will be seen that the action of the spacing mechanism in moving the carriage will turn the angular arm back again into its proper position.

The machinery for operating the printing-hammer P is shown more clearly in Figs. 2 and 4.

U is an angular arm jointed to E at U^1, and to the frame at U^2.

U^3 is an arm rigidly fastened to the printing-hammer rod V, the outer end of which is jointed at V′ to the arm U.

X′ is a spring for forcing the feeding-hammer against the paper.

The vertical movement of E imparts a vibrating movement to the arm U, (see Fig. 2,) which moves the arm U^3 and the printing-hammer.

It will be seen that when any one of the printing-keys is forced down the printing-hammer is forced away from the paper and springs against it when the pressure is withdrawn; but the mechanism for this purpose may be made so that their action will be reversed.

Y represents a small bell rigidly fastened to the frame of the machine for the purpose of giving an alarm when the paper-carriage has reached the end of its movement, or nearly so.

Y^1 is the bell-hammer, (see Fig. 2,) fastened to a swinging bar, Y^2, which is jointed to the frame at Y^3. Z is a spring for forcing it forward when striking an alarm.

Its operation is as follows: When the carriage reaches the end of its movement, the projection Z^1 on the bottom of C^1 has forced the point Z^2 of the bell-hammer lever backward and has passed by said point, thereby allowing the hammer to spring forward and strike the bell. The position of the point of the pin Z^1 being changed by the front of the paper-carriage being raised allows it to pass freely on the return movement.

Some of the advantages of this invention are as follows: The printing is in front, so as to be plainly seen. Type-wheels of different styles of type may be furnished at small expense. It prints distinct as ordinary printing from inked type, and each letter occupies its proper space, the same as in common printing.

I claim as my invention—

1. A locking-wheel, K, having a device, substantially as described, for changing its position on the shaft L^5, in combination with a type-wheel, an arm, J^3, provided with a pin, L, and a spring or other equivalent means for operating the shaft L^5, substantially as and for the purposes described.

2. The combination, with the carriage B, of the angular arm M, cord L^3, lever L^2, and platform having a depression, M^2, for lifting the front of the carriage out of the spacing-gearing, as specified, returning it to the starting-point, and dropping it into position, as described.

3. The paper-carriage, angular arm M, cord L^3, and lever L^2, in combination with the connecting-rod M^3 and curved arm O, for the purpose of holding the printing-hammer away from the paper while the carriage is returning (after a line has been printed) to the starting-point.

4. The paper-carriage provided with the angular arm M, in combination with the platform having a depression, M^2, standard T^2 T^1, and ratchet-wheel T, for the purpose of moving the paper for spacing the lines for printing, as described.

5. The combination of the carriage provided with a rack, B^2, and with paper-carriers, the driving-pinion B^3, mechanism, substantially as described, for tilting the carriage and throwing the rack and pinion in and out of gear, the ratchet-wheel T, and stationary standard T^2, having an arm, T^1, the whole constructed and arranged to move the paper when the carriage drops at the end of its lateral movement, as set forth.

6. In a type-writing machine, the spring I and a suitable gearing, substantially as specified, in combination with the shaft I^1, gearing I^2 I^3, shaft L^5, arm J^3, having a pin, L, and the locking-wheel K, provided with a releasing mechanism, substantially as and for the purposes described.

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Witnesses:

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DANL. H. BARTIS.