No. 856,333. PATENTED JUNE 11, 1907.

H. D. BOLTON.

MANIFOLDING MECHANISM.

APPLICATION FILED APR. 10, 1905.

6 SHEETS—SHEET 1.

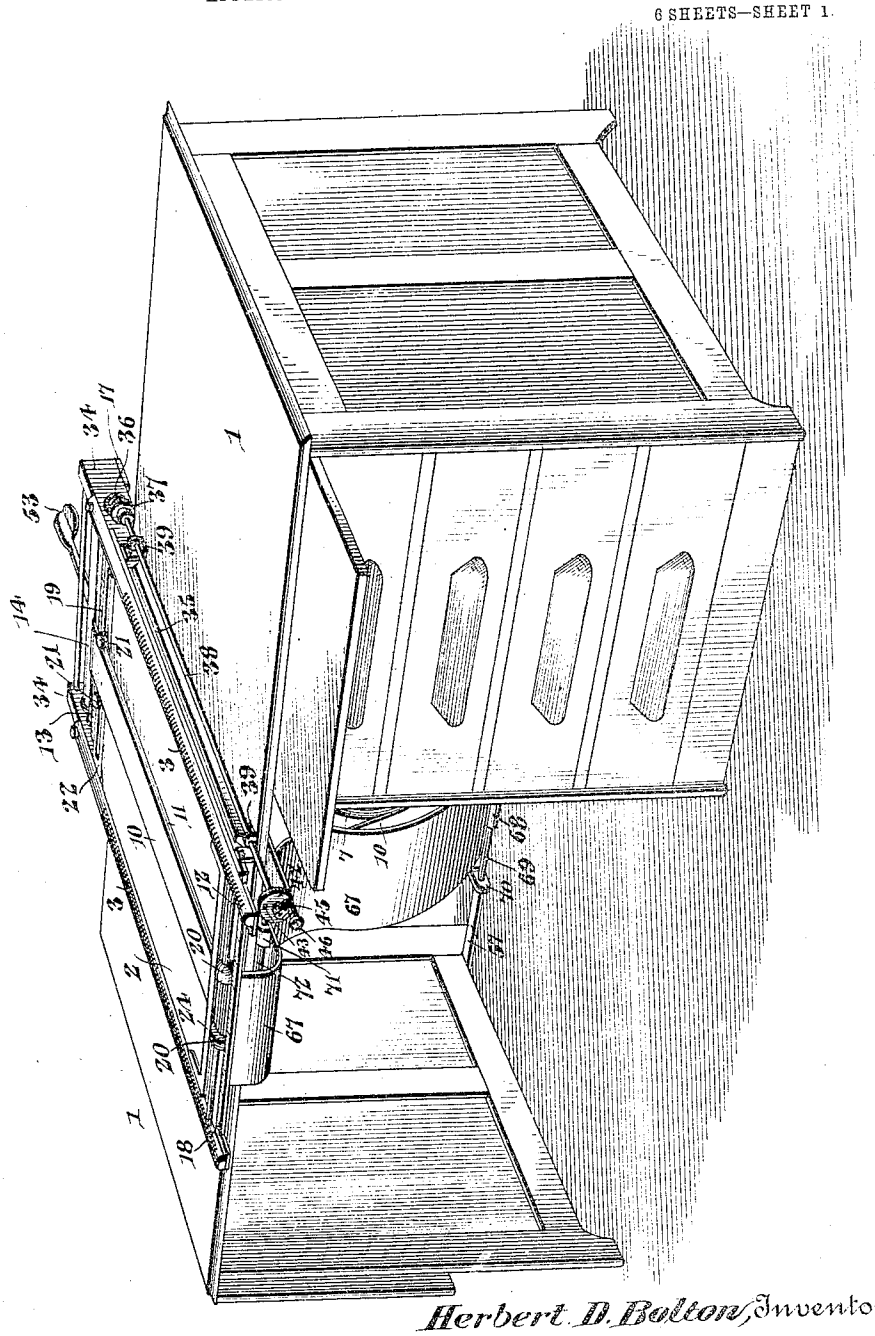

Fig. 1.

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Witnesses

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6 SHEETS—SHEET 2.

Fig. 1.

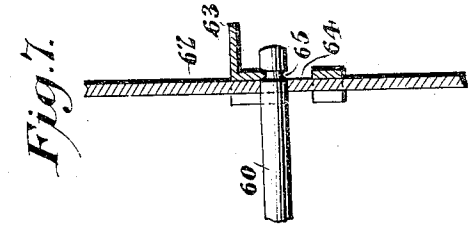
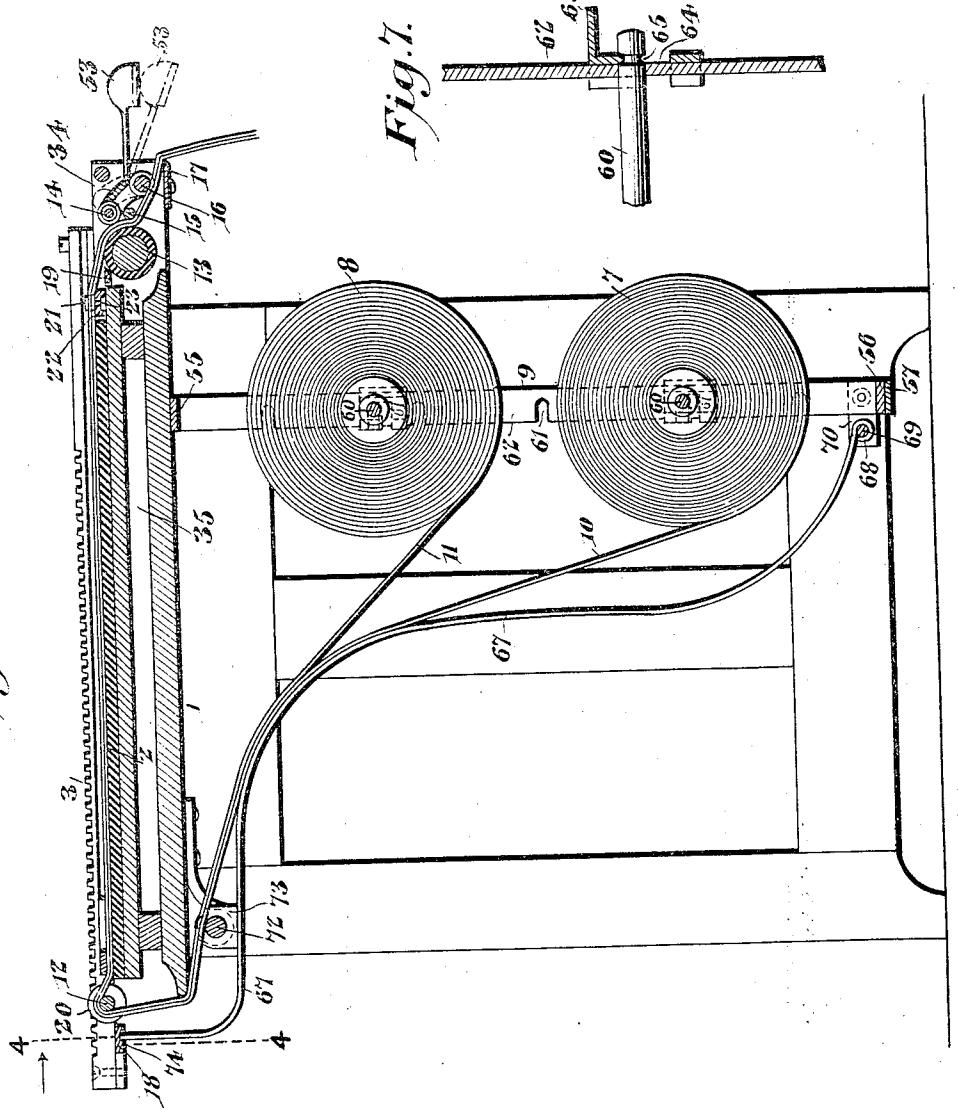


Fig. 2.



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6 SHEETS—SHEET 3.

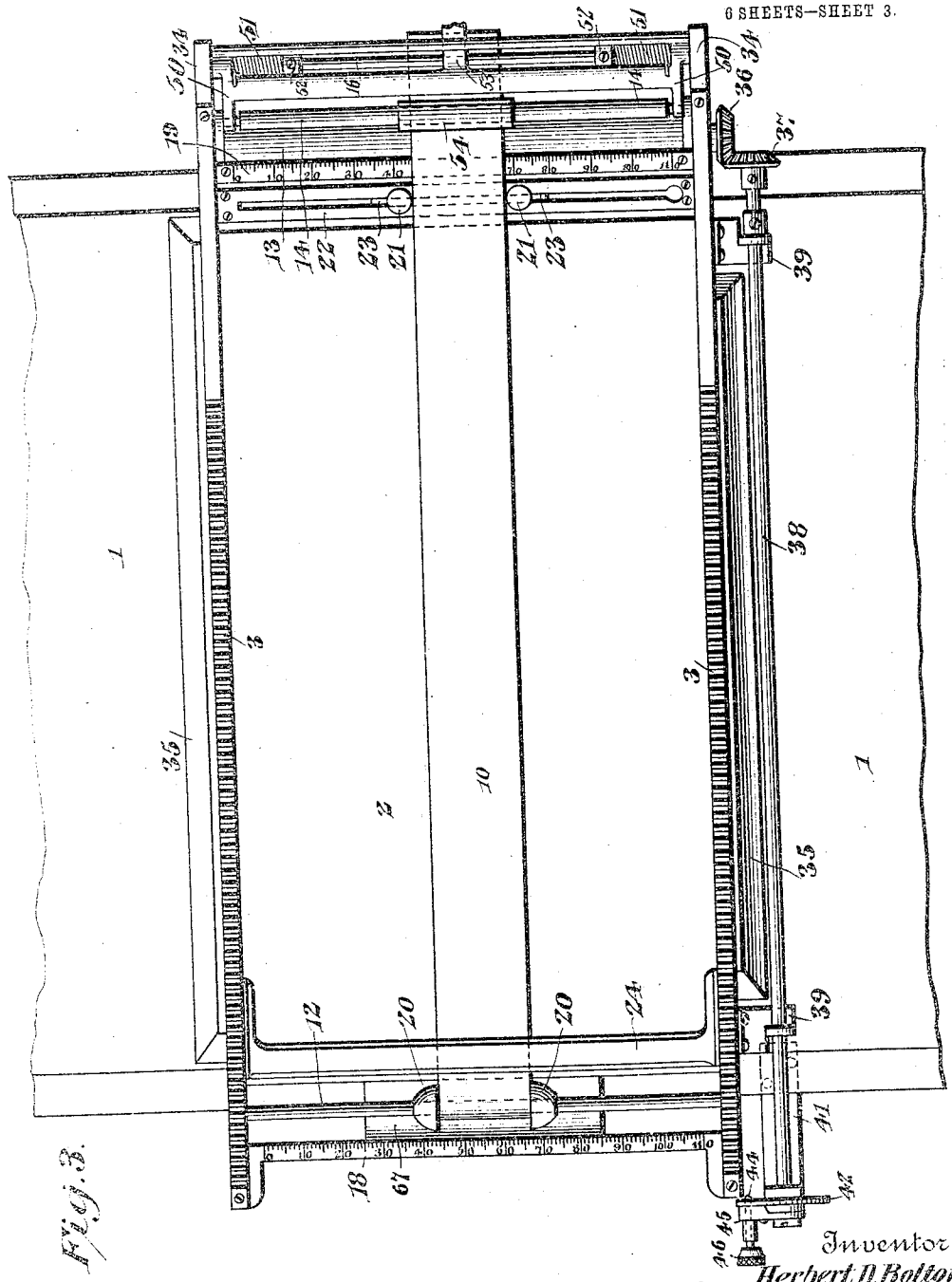

Fig. 3.

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6 SHEETS—SHEET 4.

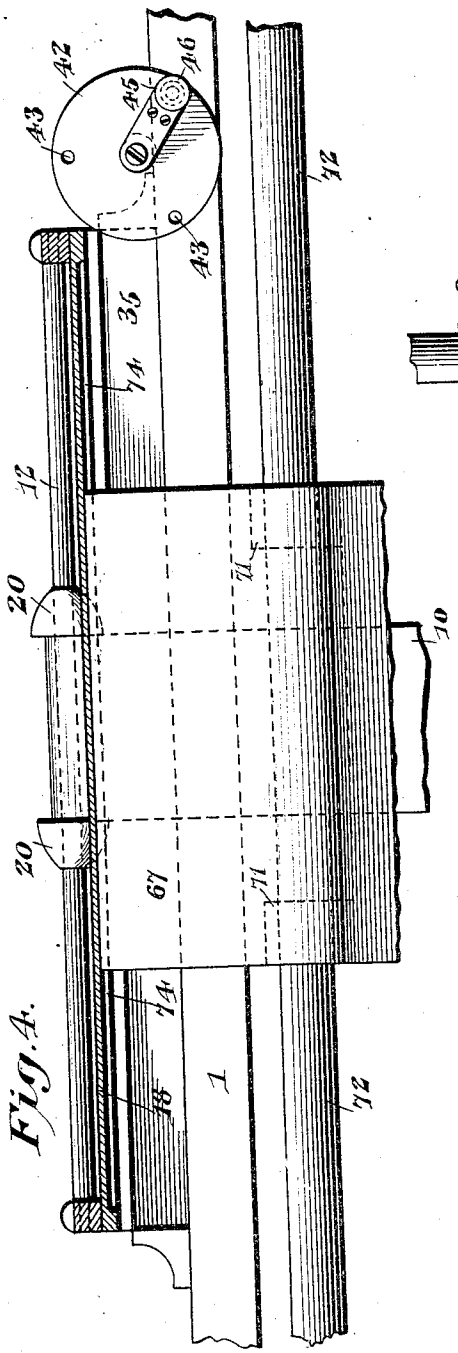

Fig. 4.

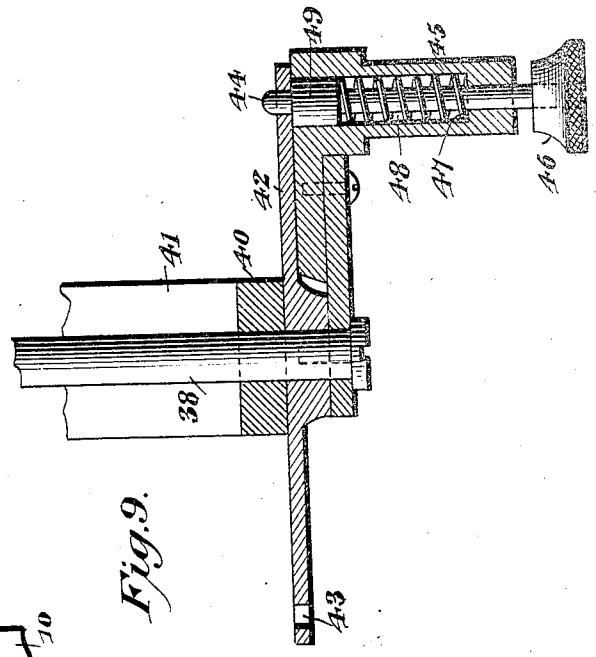

Fig. 9.

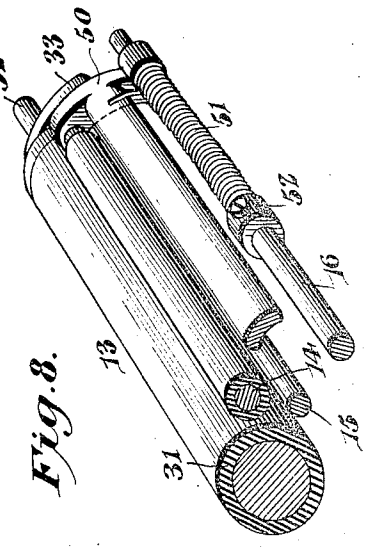

Fig. 8.

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6 SHEETS—SHEET 5.

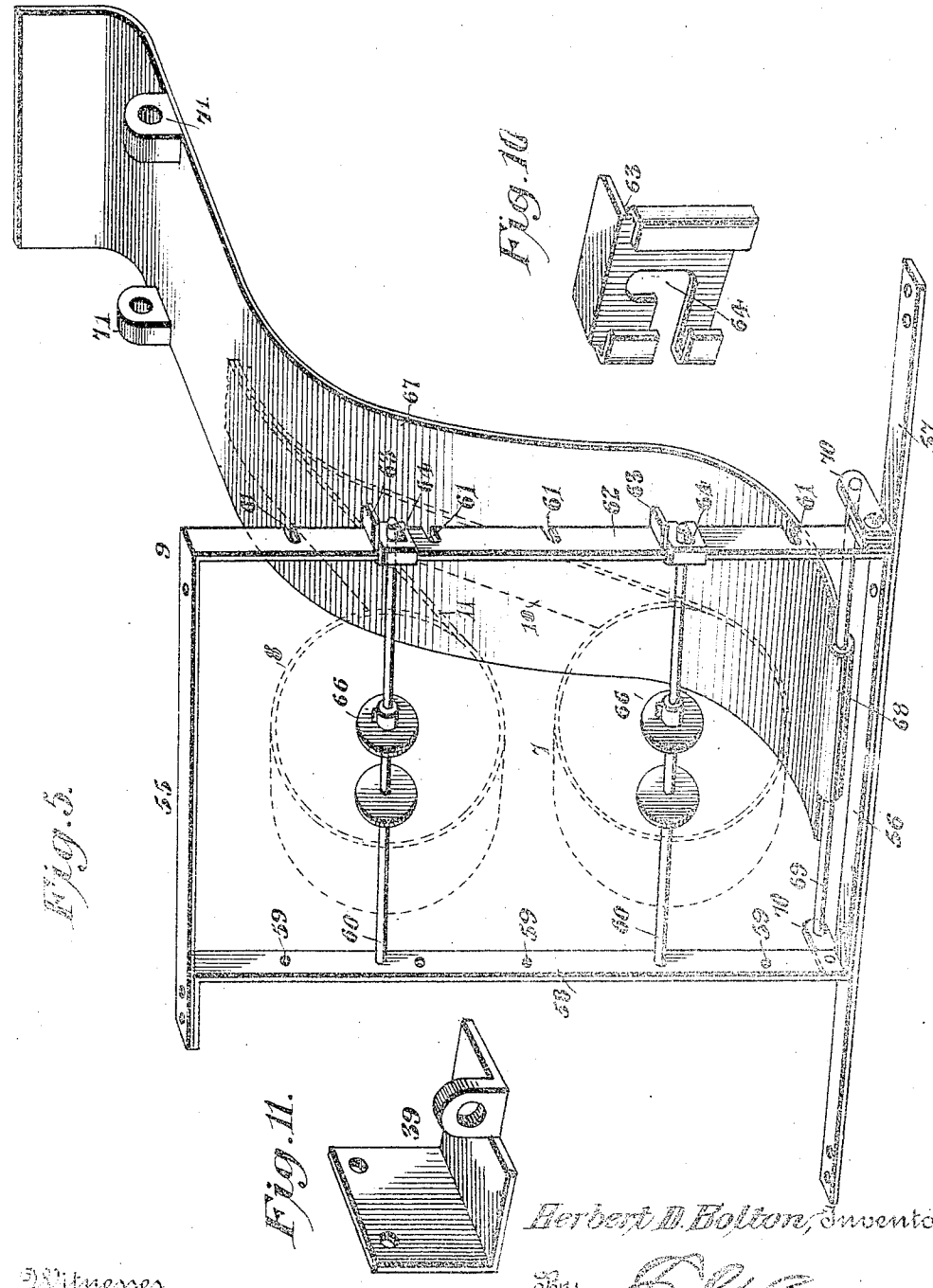

Fig. 5.

Fig. 10.

Fig. 11.

Witnesses

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No. 856,333 PATENTED JUNE 11, 1907.

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MANIFOLDING MECHANISM.

APPLICATION FILED APR. 10, 1905. 6 SHEETS—SHEET 6.

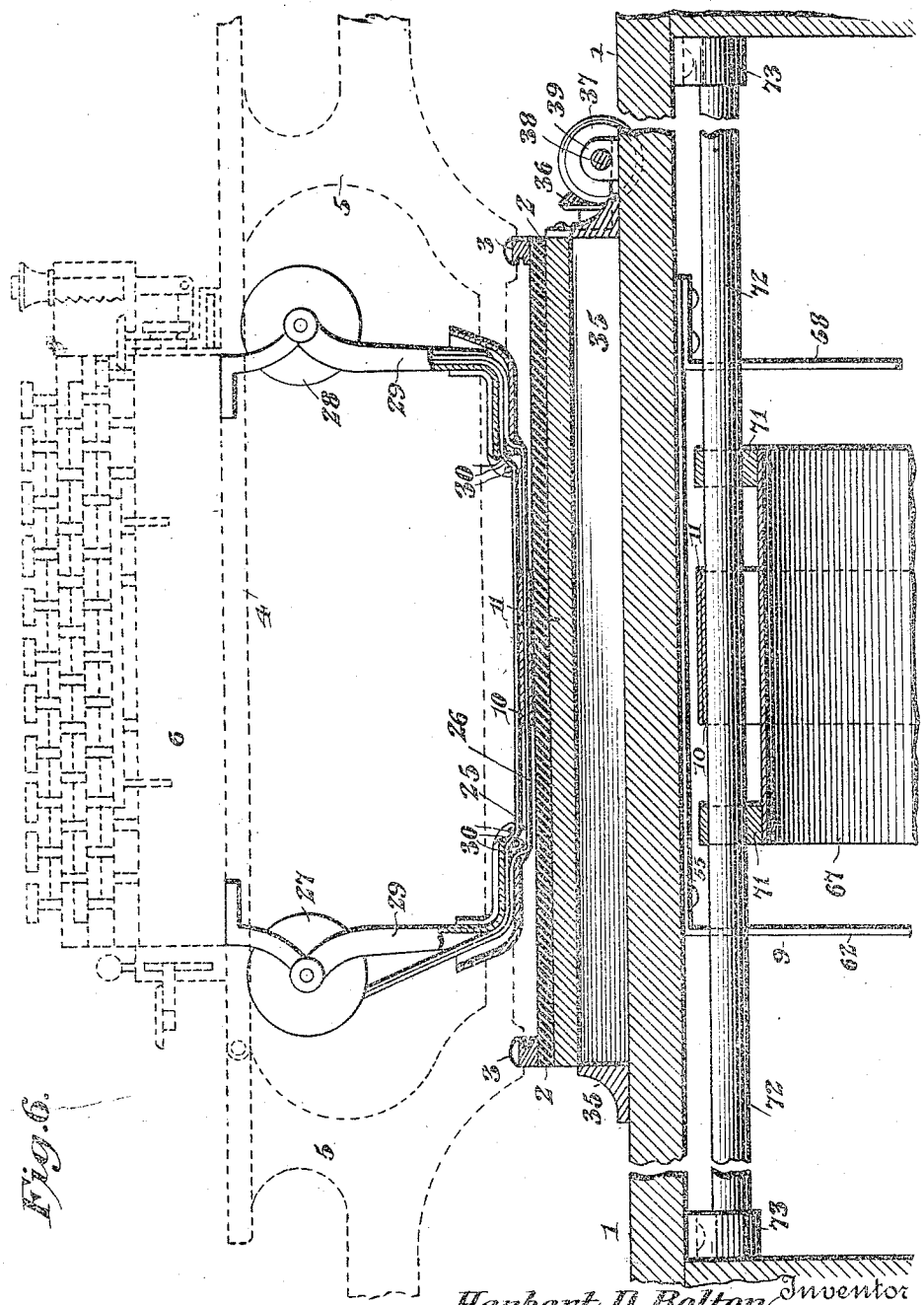

Fig. 6.

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UNITED STATES PATENT OFFICE.

HERBERT D. BOLTON, OF NEW YORK, N. Y., ASSIGNOR TO ELLIOTT-FISHER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

MANIFOLDING MECHANISM.

No. 856,333. Specification of Letters Patent. Patented June 11, 1907.

Application filed April 10, 1905. Serial No. 254,877.

To all whom it may concern:

Be it known that I, HERBERT D. BOLTON, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Manifolding Mechanism, of which the following is a specification.

This invention relates primarily to a novel manifolding mechanism, but more particularly to such as may be employed in connection with recording means in the form of a typewriter.

The principal objects of the invention may be stated as follows:—1. To produce a manifold record upon a plurality of webs, sheets, or strips, led over or opposite a support or platen, from a suitable source or suitable sources of supply, and disposed one above another with interposed transfer means. 2. To provide efficient means for the separate retention of the paper and the transfer means, in order that one may be moved independently of the other. 3. To provide paper feeding mechanism by means of which the webs are advanced from time to time to replace the printed portion with a fresh or unused portion thereof. 4. To provide efficient means for conveniently and unobtrusively supporting the spools upon which the paper webs are wound and for guiding and guarding the webs in their passage from the spools to the support or platen. 5. To provide for severing the printed portions of the webs. 6. To provide means for effecting the release of the webs from the feeding mechanism to permit their manual advance. 7. To provide transfer means in the form of a typewriter ribbon supplementing the usual ribbon of the type-writer and arranged to be fed by the ribbon motion of the machine to insure at all times the location of an effective portion of the transfer ribbon between the paper webs, and 8. To provide the ribbons with supporting means which is movable longitudinally of the paper webs and independently thereof, in order that said ribbons may maintain their proper relative positions with respect to each other, to the paper webs, and to traveling recording mechanism which is advanced along the webs to record thereon at successive points.

Other objects, subordinate to those enumerated, will appear during the course of the succeeding description.

In the accompanying drawings—Figure 1 is a perspective view of a desk equipped with my manifolding mechanism. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a plan view with portions of the desk broken away. Fig. 4 is a section on the line 4—4 of Fig. 2. Fig. 5 is a detail perspective view of the roll supporting frame and paper guard, the rolls and portions of the webs being indicated in dotted lines. Fig. 6 is a transverse section on an enlarged scale and designed particularly to show the relation of the platen to the typewriting machine and the relative positions of the paper webs and ribbons. Fig. 7 is a detail view illustrating one of the spool shaft retaining devices. Fig. 8 is a detail perspective view of the feed roll and associated parts, with portions broken away. Fig. 9 is a detail sectional view of a portion of the paper feeding mechanism. Fig. 10 is a detail perspective view of one of the spool shaft retainers, and Fig. 11 is a similar view of one of the feed shaft brackets.

Each part is indicated by its appropriate reference character throughout the views.

1 indicates a desk upon the top of which is mounted a flat platen 2, which, in the illustrated embodiment of the invention, is of a form ordinarily employed in connection with an Elliott-Fisher typewriter, exemplified in Patent No. 573,868. Along the opposite edges of the platen 2 are disposed tracks or guides 3 upon which the typewriting machine 4 is mounted to travel.

It will be understood that in the broader aspects of my invention, the use of a pen, pencil, stylus, or any other character of recording instrument is contemplated, but the illustrated construction has been devised with special reference to the production of typewritten records, and for this reason, the Elliott-Fisher typewriter 4 is disclosed as one form of recording mechanism which may be utilized. It is thought to be unnecessary to describe the typewriter in detail, but it may be said in passing that the machine includes a machine frame 5 mounted to travel longitudinally of the platen upon the tracks 3 and supporting a carriage 6 movable transversely of the platen on the frame 5 and equipped with key-operated printing devices.

Below the rear end of the platen, a pair of paper rolls 7 and 8 are mounted in a supporting frame 9 secured in the open portion of the

desk below the top thereof, as shown in Fig. 2. From these rolls 7 and 8 the paper webs 10 and 11 are led forwardly and upwardly, around the front edge of the desk top and over a roller 12 extending between the tracks or guides 3 in front of, but adjacent to the front end of the platen. The paper webs, disposed in superposed relation, are led rearwardly over the platen from the roller 12 and beyond the rear end of the platen are passed between a feed roll 13 and a pressure roll 14 and thence under a pair of guide bars 15 and 16 to a knife or cutter 17, by means of which latter, the ends of the webs are severed from time to time, as desired.

To facilitate the proper location of the paper strips upon the platen and to guide the same in their endwise movement, adjustable paper guiding means is preferably employed at or adjacent to the opposite ends of the platen and in proximity to a pair of transverse scale bars 18 and 19 having corresponding graduations facilitating the accurate adjustment of the guiding means.

In the present embodiment of the invention, the paper guiding means includes a pair of collars 20 shiftably mounted on the roller 12 and a pair of studs 21 adjustable along the slotted bar 22 extending between the tracks 3 at the rear edge of the platen, see Fig. 3. The collars 20 are preferably of rubber or other material the resiliency of which will retain them in their proper positions, and the studs 21 being provided with resilient retainers 23 such as are commonly employed upon gage-pins, which are common in this art. The collars 20 and studs 21 constitute means for retaining the paper webs in their proper relative positions, as well as means for retaining the webs at the proper point on the platen and for guiding said webs when the latter are fed longitudinally. To insure the retention of the webs flat against the platen, the tracks 3 are grooved for the reception of the opposite ends of a transverse work-holding or guarding member 24 in the form of a thin metal plate imposed upon the web and shiftable longitudinally of the platen to any desired position.

Disposed transversely of the platen are two ink ribbons or equivalent strips 25 and 26 disposed one above the other and having their opposite ends wound upon the ribbon spools 27 and 28, which constitute usual elements of the typewriter construction. These intermittently rotary ribbon spools constitute the primary elements of the ribbon supporting and feeding mechanism, it being deemed unnecessary to show the ordinary mechanism by means of which motion is imparted to the spools. Associated with each of the spools 27 is a ribbon supporting and guiding frame 29. These frames depend toward the platen and their lower ends are disposed horizontally and equipped with ribbon guiding bars 30 which serve to properly dispose those portions of the ribbon which lie adjacent to the platen and extend between the frames. The ribbon 25 is disposed immediately over the upper paper web 10, while the ribbon 26 is interposed between the webs but directly under the ribbon 25, see Fig. 6.

By reason of this arrangement, the depression of a typewriter key will cause one of the printing or recording devices to strike the ribbon 25, which transfers an ink impression of the type to the upper sheet and causes the subjacent ribbon 26 to transfer a similar impression of the record to the under strip of paper. Thus, it will be seen, that by interlacing the ribbons and paper sheets in the manner described, the record will be produced upon the several strips, and these records will all be in effect original, by reason of the employment of a separate ribbon for each of them.

Obviously, it is within the purview of the invention to increase the number of paper strips and ribbons if it is desired to obtain a greater number of copies of the record. Similarly, the ribbons, instead of being wound upon the same spools, may be provided with separate spools.

It will now be noted that the transfer means and the paper are provided with separate independent retaining means, so that either the paper or the ribbons may be independently fed. By this arrangement, the paper is left undisturbed when the ribbon is fed from spool to spool or moved transversely of the platen with the carriage of the typewriting machine or moved longitudinally of the platen when the machine, as a whole, is advanced for line spacing or moved back to the rear end of the platen upon the completion of a record. Similarly, the ribbons are not disturbed when the paper strips are advanced for the purpose of displacing the printed portion thereof from the platen.

The paper feeding roll 13 is provided with a rubber or other frictional covering 31 and its trunnions 32 are journaled in plates 33 screwed to the inner faces of the side members 34 of a frame structure 35 in which the platen is mounted. To the right hand trunnion of the roll 13 is fixed a beveled pinion 36 meshing with a similar pinion 37 at the rear end of a feed shaft 38 journaled in suitable brackets 39 secured at the opposite ends of the adjacent side of the platen. At its front end the shaft 38 is provided with an additional bearing in the upturned end 40 of a bracket 41 secured to the desk top, see Fig. 3. To the front face of this bracket is fixed a stop dial 42 provided with a series of openings or sockets 43 designed to receive a stop plunger or latch 44 mounted in an operating crank or handle 45 secured to the front end of the feed shaft 38 and serving as an operating means therefor. The stop plunger 44 is

provided at its front end with a knob 46 by means of which the plunger may be withdrawn from the dial against the resistance of a spiral spring 47 located within a recess 48 in the handle 45 and bearing at one end against the front end wall of the recess and at its opposite end against an enlargement 49 on the plunger. Normally, the plunger engages the dial, as shown in Fig. 9, and locks the crank against movement, thus preventing accidental operation of the paper feeding mechanism while the record is being made. When, however, it is desired to displace the printed portion of the paper strips from the platen, the plunger 44 is drawn back and the crank is turned to rotate the feed shaft 38 and thus effect the rotation of the feed roller 13 and the rearward feed of the paper strips or webs which are drawn against the cutter 17 to sever their printed end portions. At this point attention may be directed to the fact that the paper is engaged at the rear end of the platen and drawn back while the mechanism for operating the engaging devices is located at the front end of the platen and in convenient reach of the operator. It will be noted, furthermore, that while it is possible to secure a feed of any desired extent, by holding back the plunger 44 during the rotation of the crank 45, it is, nevertheless, possible to secure a predetermined feed of the paper by releasing the plunger immediately after the crank is started, so that, as soon as the plunger arrives opposite the next opening 43 in the dial, it will spring into the same and arrest the movement of the crank. In a similar manner any multiple of this predetermined feed may be obtained.

The pressure roll 14 is mounted in what may be termed a pressure frame 50, mounted to swing from the bar 16 and urged toward the feed roll by springs 51 encircling the bar. One end of each spring bears against the frame 50 and the other end is secured to a collar 52 fixed to the shaft 16, as shown in Fig. 3. As it is sometimes desirable to rapidly withdraw considerable portions of the paper strips by hand, the pressure frame 50 is provided with a rearwardly extended thumb piece or handle 53 by means of which the frame may be rocked against the resistance of the springs 51 to withdraw the pressure roll 14 from the feed roll 13, as shown in dotted lines in Fig. 2. The pressure roll 14, like the feed roll 13, is preferably provided with a frictional sleeve or covering 54.

While the paper rolls may be supported in a variety of ways, I have shown more particularly in Figs. 1, 2 and 5, a very simple, inexpensive and efficient arrangement by means of which an ordinary desk may be quickly equipped in accordance with the invention. The roll supporting frame 9 is of rectangular form and is preferably made by suitably bending a single metal strip, as shown in Fig. 5. The top bar 55 of this frame is screwed or otherwise secured to the under side of the desk top and the bottom bar 56 is fastened to a metal supporting strip 57 projecting beyond opposite sides of the frame and terminally secured to the desk adjacent to the bottom thereof. One of the side bars 58 of the frame 9 is provided with a series of openings 59 for the accommodation of the spool shafts 60, the opposite ends of said shafts being received within notches 61 extending back from the front edge of the other side bar 62. To prevent the displacement of the shafts 60, I provide each with a retainer 63 in the form of a metal slide mounted on the bar 62 and provided with a bayonet slot 64, the horizontal portion of which coincides with one of the notches 61 when the shaft 60 is slipped to its place. When the shaft is in position, the slide 63 is depressed so as to move the horizontal portion of the slot out of coincidence with the notch, this movement of the slide being accommodated by the vertical branch of the slot 64. To retain the shafts 60 against longitudinal, as well as lateral displacement, each is provided with an annular groove 65 which is engaged by the retainer 63 when the latter is moved down in the manner described, see Fig. 7.

By providing the side bars of the roll supporting frame 9 with series of openings and notches, as described, I am enabled to mount within the frame any desired number of paper rolls and to accommodate rolls of different sizes. Each shaft or spindle 60 is equipped with a pair of adjustable collars 66 between which a roll of any desired width may be mounted and retained, see Fig. 5. Each pair of collars and that portion of the spindle or shaft extending between the same constitute, in effect, a spool. It should also be noted in this connection, that the adjustability of the collars 66 permits the mounting of the rolls at the center of the frame 9, or nearer one side or the other thereof, according to the desired position of the paper strips upon the writing surface of the platen.

Inasmuch as the knees of the operator extend into the open portion of the desk, I provide a sheet metal guard 67, see Figs. 1, 2 and 5, having its lower end 68 bent around a bar 69 extending between a pair of brackets 70 secured to the lower ends of the bars 58 and 62 of the roll supporting frame. The guard is bent into appropriate form to properly protect the paper webs and adjacent to its upper end is provided with a pair of ears 71 slidable upon a bar 72 carried by a pair of supporting brackets 73, secured to the under side of the desk top, see Figs. 2 and 6. The upper extremity of the guard 67 is received within a longitudinal slot 74 in the under side of the scale bar 18. The guard 67, while somewhat wider than the paper strips, is narrower than

the open portion of the desk and may therefore be shifted laterally in order to insure its location directly opposite the webs.

Before concluding, attention may be directed to the fact that the invention in its broader aspects is capable of application to platens of various forms, whether movable or stationary, and whether disposed horizontally or vertically. In all cases, however, the paper web would be led opposite or over (these terms being used synonymously herein) that portion of the platen opposite which the printing or writing is done and the terminology employed in the claims is to be construed in accordance with this definition.

It is thought that from the foregoing, the construction, operation and advantages of my manifolding mechanism will be fully comprehended. It should be understood, however, that while the illustrated construction is thought at this time to be preferable, I reserve the right to effect such changes, modifications and variations thereof, as may come fairly within the scope of the protection prayed.

What I claim is:—

1. In a manifolding means, a support or platen for a plurality of superposed paper webs, a typewriter mounted to travel over the platen longitudinally of the paper webs and including printing devices and inking means, and a transfer web interposed between the paper webs and movable longitudinally of said webs with the typewriter.

2. In a manifolding means, a support or platen for a plurality of paper webs, a plurality of transfer webs, the paper and transfer webs being interwoven, and means supporting the transfer webs and movable longitudinally of the paper webs.

3. In a manifolding means, a support or platen for a plurality of superposed paper webs, a plurality of transfer webs disposed at right angles to the paper webs, the paper and transfer webs being interwoven, and spools rotatable to feed the transfer webs longitudinally and movable to shift the transfer webs longitudinally of the paper webs.

4. In a manifolding means, a platen and a typewriting machine, relatively movable, and a plurality of ink ribbons carried by the machine, and interwoven with a plurality of paper webs led over the platen.

5. In a manifolding means, a platen and a typewriting machine, relatively movable, and a plurality of ink ribbons mounted on the typewriting machine and disposed at right angles to and in alternating arrangement with a plurality of paper webs led over the platen.

6. In a manifolding means, a platen supporting a plurality of superposed paper webs, a typewriting machine, a plurality of inking ribbons disposed transverse to the paper webs and alternating therewith, and ribbon spools carried by the typewriting machine to retain the ribbons and shiftable longitudinally of the paper webs.

7. In a manifolding means, a flat platen for a plurality of paper webs led over the platen, recording mechanism movable over the platen, and a plurality of inking ribbons movable with the recording mechanism and alternating with the paper webs.

8. In a manifolding means, a flat platen supporting a plurality of paper webs, a typewriting machine mounted to travel thereover, ribbon spools mounted on and movable with the typewriting machine, and a plurality of inking ribbons extending between the spools and arranged one above another at right angles to the paper webs and in alternating arrangement therewith, said ribbon spools being rotatable to feed the ribbons endwise and also having movement relative to the typewriting machine as well as with the latter to shift the ribbons longitudinally of the paper webs.

9. In a manifolding means, a flat platen, printing mechanism mounted to travel thereover, means for retaining a plurality of superposed paper webs on the platen, and a plurality of inking ribbons supported by and movable with the traveling printing mechanism and disposed at right angles to and in alternating arrangement with the paper webs, whereby the ribbons will be shifted longitudinally of the paper webs as the printing mechanism advances for line spacing.

10. In a manifolding means, a typewriting machine including a platen serving as a backing for a plurality of paper webs, a movable carriage and a machine frame, said machine being equipped with an inking ribbon, and a transfer element interposed between the paper webs and movable longitudinally thereof with the carriage.

11. In a manifolding means, a flat platen, tracks or guides, a typewriting machine mounted to travel thereon and including a transversely movable carriage, means for retaining a plurality of paper webs led over the platen, ribbon spools mounted on the carriage and capable of both endwise and rotary movement, and a plurality of inking ribbons extending between the spools and having alternating arrangement with the paper webs.

12. In combination, a stationary flat platen, a feed device located at the rear end thereof to engage a paper web and draw the same rearwardly over the platen, and operating means located at the front end of the platen within convenient reach of the operator and having operative connection with the feed device.

13. In combination, a stationary flat platen, a paper roll located below the plane of the platen and having a paper web led around the front end of the platen and thence

rearwardly over said platen, paper feeding means located at the rear end of the platen to engage the web and draw the same rearwardly over the platen from the paper roll, typewriting mechanism disposed above the platen to print on the web, and operating means located at the front end of the platen and having connection with the paper feeding means located at the rear end thereof.

14. In combination, a stationary flat platen serving as a backing for a plurality of paper webs, typewriting mechanism mounted to travel over the platen, a transfer element interposed between the paper webs and movable longitudinally thereof with the typewriting machine to transfer the type impression to an underlying web as the upper or outer web is printed upon, paper feeding means located at the rear end of the platen to draw the paper webs rearwardly thereover to present unused portions of said webs in the printing area, and means located at the front end of the platen, for operating the paper feeding means located at the rear end thereof.

15. In combination, a stationary flat platen, a paper feeding roll located at the rear end thereof to engage a paper web and draw the same rearwardly over the platen, an operating crank located at the front end of the platen within convenient reach of the operator, a feed shaft extending along one side edge of the platen from the crank and geared to the feed roll, and stop mechanism for arresting the crank after predetermined movement thereof, said stop mechanism including coöperating members one of which is movable out of interfering relation with the other to permit continued movement of the crank after the same has been arrested at the proper point by the stop mechanism.

16. In combination, a platen, a feed roll disposed at one end thereof, a feed shaft geared to the roll and extended to the other end of the platen, a crank carried by the shaft, a spring-urged stop plunger mounted in the crank, and a stationary plate provided with a series of openings disposed to be engaged by the stop plunger to lock the crank in either of several positions.

17. In combination, a platen, a paper feeding roll at one end thereof, operating means for said roll at the other end of the platen, a bodily movable pressure roll disposed to clamp the paper against the paper feeding roll, and means for moving the pressure roll to release the paper.

18. In combination, a platen, a pair of paper guiding devices located at each end of the platen and adjustable transversely thereof, and scale bars disposed transversely of the platen adjacent to said devices to facilitate the adjustment thereof.

19. In combination, a stationary flat platen, a paper roll disposed below the rear end thereof, a paper web extended from the roll to the front end of the platen and thence rearwardly over the latter, and paper feeding means disposed to engage the web beyond the rear end of the platen and an operating device located at the front end of the platen and operatively connected to the paper feeding means.

20. In combination, a horizontal flat platen, a vertically disposed roll supporting frame below the rear end of the platen, paper rolls carried by the frame, paper webs extended to the front end of the platen and thence rearwardly over the platen from said rolls, paper guiding means disposed to maintain the paper webs in superposed relation, means located at the rear end of the platen for engaging and feeding the web and an operating device located at the front end of the platen and operatively connected to the paper feeding means.

21. In combination, a stationary flat platen, a plurality of paper rolls disposed one above another below the rear end of the platen, paper webs extended to the front end of the platen and thence rearwardly over the platen from said rolls, a guard located in advance of the rolls and webs, and a pair of transverse bars along which the guard is adjustable.

22. In combination, a desk having an open portion, a platen on top of the desk, a plurality of paper rolls mounted in the open portion of the desk below the end of the platen, paper webs led rearwardly over the platen from the rolls, and paper feeding mechanism arranged to engage the webs at the rear end of the platen.

23. In combination, a desk having an open portion, a paper roll supporting frame secured to the desk and mounted at the rear side of the open portion thereof, a platen supported upon the top of the desk, paper rolls mounted in the frame, and having paper webs led rearwardly over the platen from said rolls paper feeding means located at the rear end of the platen, and an operating device therefor located at the front end of the platen.

24. In combination, a desk having an open portion, a platen mounted on the desk, a paper roll supporting frame mounted in the open portion of the desk adjacent to the rear side of the latter, paper rolls mounted in the frame, paper webs led rearwardly over the platen from said rolls, and a guard disposed to prevent the knees of the operator from contacting with the rolls or webs and movable to different positions transversely of the desk.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

HERBERT D. BOLTON.

Witnesses:

ADOLPHE GUIRCHEMANE,

ARCHIE R. BAKER.