

(No Model.)

A. AYER.

DEVICE FOR GRADING ORANGES.

No. 383,205.

Patented May 22, 1888.

Fig. 1.

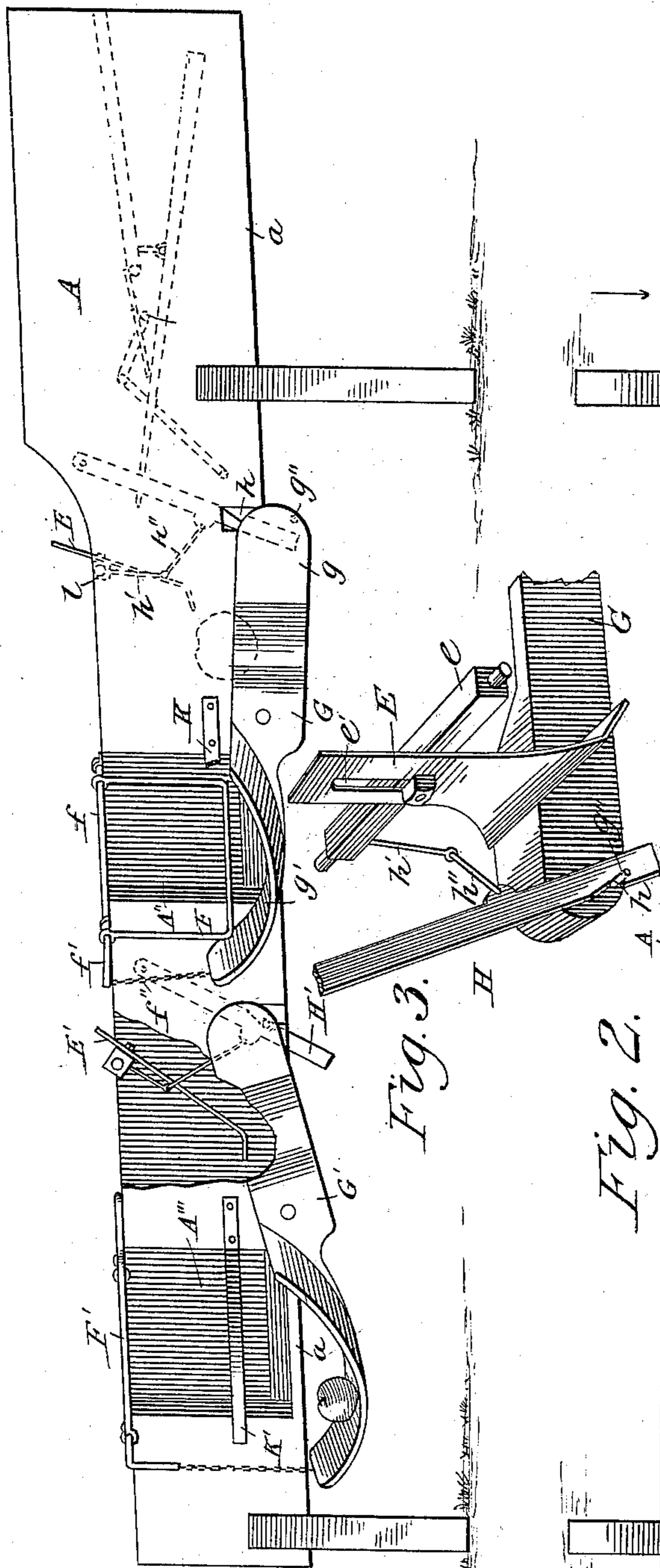
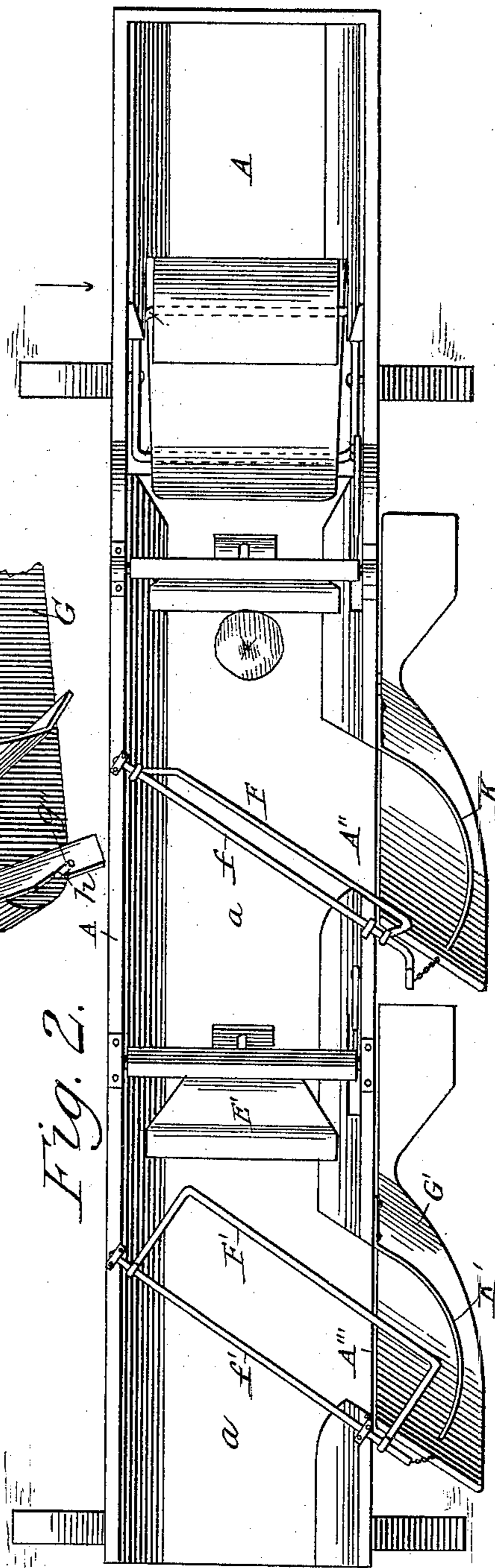


Fig. 3.

Fig. 2.



Witnesses.

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DEVICE FOR GRADING ORANGES.

SPECIFICATION forming part of Letters Patent No. 383,205, dated May 22, 1888.

Application filed March 14, 1887. Serial No. 230,749. (No model.)

To all whom it may concern:

Be it known that I, ALFRED AYER, a citizen of the United States, residing at Lake Weir, in the county of Marion and State of Florida, have invented certain new and useful Improvements in Devices for Grading Oranges; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is an improved device for grading oranges according to their size, and is fully described and explained in this specification and shown in the accompanying drawings, in which—

Figure 1 is a side elevation of the entire device, a part of its side wall being broken away to show parts within, and certain of the internal parts being indicated by dotted lines. Fig. 2 is a plan of the entire device. Fig. 3 is a perspective view of one of the tripping-levers and its connected parts.

In these views, A is a trough having an inclined bottom, *a*, and having its upper or rear end closed and its lower or front end preferably open. One of the side walls of the trough is preferably continuous and the other formed with suitable openings, A^2 A^3 , &c., for the lateral escape of the oranges as they are graded by the machine, though it is evident that part of these openings may be in one side wall and the remainder in the other. At the upper or rear end of the trough is a stationary platform, A' , above and approximately parallel to the bottom *a*, and beneath the stationary platform is an oscillating platform, B, hinged near its middle to the front end of the stationary platform, and these, with connected devices, are together capable of automatically delivering oranges singly to the grading mechanism, to be described.

In front of the oscillating platform B, and between it and the first opening, A^2 , in the side of the trough, is an oscillating lever, E, rigidly fastened to a transverse rod, *e*, which is pivoted in the sides of the trough. The lever is formed with a vertical slot, *e'*, by means of which its position on the transverse rod *e* and with reference to the bottom *a* of the trough may be adjusted in order that it may be oper-

ated or actuated by an orange of any desired size, the lever being fastened to the transverse rod by means of a bolt or screw passing through the slot and entering the rod, or by any other well-known means. A bar, H, formed with a notch, *h*, in its rear edge, is pivoted to one of the sides of the trough at a point a short distance in rear of the lever E, and is connected with the pivot of the lever by means of an arm, *h'*, rigidly fastened to the pivot, and a link, *h''*, connecting the end of said arm with the bar. The normal position of the parts E H is that indicated in dotted lines in Fig. 1 and in full lines in Fig. 3, and when they are in this position the notch *h* in the bar H registers with a suitable opening in the side wall of the trough, as shown in Figs. 1 and 3.

Immediately in front of the opening A^2 is a preferably oblique transverse guard, F, of wire or other suitable material, whose upper edge, *f*, is pivoted to the side walls of the trough. When left entirely free, this guard hangs in an approximately-vertical position, as shown in Figs. 1 and 2, thus forming a barrier in the trough and preventing the passage of an orange to any point in front of it. It is, however, ordinarily held in a horizontal position by means of a cord, f^2 , which is fastened to the free end of an arm, f' , formed integrally with the guard, and connects it with the front end, *g'*, of a vertically-oscillating bridge, G, lying outside the trough and on the side in which is formed the opening A^2 . The bridge G is pivoted near its center to the side wall of the trough, and its rear end, *g*, is heavier than its front end, *g'*, so that when left to itself it drops down and assumes the position shown in full lines in Fig. 1. If, however, the front end, *g'*, of the bridge be depressed, the guard F is raised by means of the cord f^2 to a horizontal position and the bridge itself assumes the position illustrated at G' , Fig. 1, and is retained in that position by means of a pin, g^2 , on the inner face of its rear end, which enters the notch *h* in the bar H. When the parts are in this position, if an orange of sufficient size to strike the lower end of the lever E be passed forward from the platform B, it strikes and moves forward the lower end of the lever E, draws forward the lower end of the bar H, and thus releases the pin g^2 from the notch *h* in the

bar. As soon as the pin g^2 is released, the rear end, g , of the bridge G drops down and the front end, g' , rises, allowing the guard F to assume the vertical position shown in Figs. 1 and 2. The orange reaching the guard F , which extends obliquely across the trough, is deflected to the side, passes through the opening A^2 and over the front end, g' , of the bridge G , and thence into any suitable receptacle.

The weight of the orange as it strikes the bridge depresses the front end thereof, raises the guard F to its horizontal position, and at the same time throws the pin g^2 into engagement with the notch h of the bar H . The device is now ready for a second operation, and the process described is repeated as often as an orange having a sufficient diameter to strike the lower end of the lever E passes along this part of the trough. At each of the openings in the side wall of the trough is arranged an oscillating lever, a transverse guard, and a bridge corresponding in construction, operation, and connection to the parts $E F G$, the only difference between the different members of the series of tripping devices being that the lever E nearest the stationary platform is farther from the bottom a of the trough than the one next succeeding, and each succeeding lever $E^2 E^3$, &c., is somewhat nearer to the bottom of the trough than the one immediately preceding it. I have illustrated two of these dropping devices in the drawings as showing sufficiently the nature of their arrangement; but I have found in practice that in grading oranges for market it is necessary to separate them into a number of different classes according to their varying sizes, the number of such classes being different according to the general grade and uniformity of any special lot of fruit operated upon. It is evident, however, that the number of these devices is immaterial, and I do not, therefore limit myself in that regard.

Immediately over the front end of each of the bridges G is shown a rod, K , which prevents the escape of the orange from the guard until the front end of the bridge has dropped down sufficiently to secure the engagement of the pin g^2 with the notch h of the bar H . I have found in practice that while ordinarily an orange passing out of the trough and dropping on the bridge will actuate the latter perfectly without the use of the restraining-rod, it occasionally happens that the force with which the orange is moving carries it over the bridge before its weight actuates the bridge sufficiently.

It is evident that instead of forming the levers E with slots for adjustment each of them might be made with a single opening for the passage of a screw, the screw-holes being so differently placed as to bring the lower ends of the levers at the proper relative distances from the bottom of the trough; or, instead of this, the levers might be made of different lengths in order to provide for this difference in their respective distances from the bottom of the

trough. I prefer, however, to provide them with means for vertical adjustment, as by so doing they can be made exactly alike and adjusted to suit the requirements of each particular case in which the device is used.

I have only described the operation of the device in the case where the orange strikes the first lever E . It is evident, however, that when all the dropping devices are in working position, the guards $F F'$, &c., being approximately horizontal, an orange may pass under the first one or two or more of the levers $E E'$, &c. until it reaches a lever whose lower end is sufficiently near the bottom of the trough to be struck and actuated by the orange. On reaching such a lever the operation of the dropping device will be precisely the same as that already explained, and the orange, instead of passing out at the first or second or third of the openings in the side wall of the trough, as the case may be, will pass out of the opening corresponding with the lever which it strikes.

Having now described and explained my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the trough A and the tripping-lever E , pivoted thereto, of the bridge G , pivoted to the side of the trough and having its rear end, g , heavier than its front end, g' , the ratchet-bar H , adapted to support the rear end of the bridge G , and means, substantially as described, connecting the tripping-lever E with the ratchet-bar H , whereby the forward motion of the lower end of said lever releases the rear end of the bridge and allows the same to drop, substantially as and for the purpose set forth.

2. The combination, with the trough A , having the opening A^2 in its side, of the guard F , pivoted to the trough, the pivoted bridge G , having its front end connected with the guard F and adapted when depressed to raise the guard to a horizontal position, the ratchet-bar H , pivoted to the trough and adapted to support the rear end of the bridge, and the tripping-lever E , pivoted to the trough and connected with the ratchet-bar H , whereby the forward motion of the lower end of the lever releases the rear end of the bridge, raises the lower end thereof, and allows the guard F to drop downward and obstruct the trough, substantially as and for the purpose set forth.

3. The combination, with the trough A , having the opening A^2 in its side, of the guard F , pivoted to the trough, the pivoted bridge G , having its front end connected with the guard and adapted when depressed to raise the same to a horizontal position, and the outer guard, K , adapted to insure the depression of the front end of the bridge upon the passage of an orange through the opening A^2 and over the bridge, substantially as and for the purpose set forth.

4. The combination, with the trough A , having a series of openings, $A^2 A^3$, &c., in its

sides, of a series of pivoted tripping-levers, E, corresponding to said series of openings and having their lower ends separated from the bottom of the trough by spaces decreasing successively from the first to the last of the series, a series of transverse guards, F F', &c., pivoted to the trough and adapted when vertical to obstruct the same, means, substantially as shown and described, whereby each of the guards F F', &c., is held in a horizontal position, and means, substantially as shown and described, whereby the forward motion of the lower end of each of the tripping-levers causes the depression of the corresponding guard, substantially as shown and described.

5. The combination, with the trough A, of the tripping-levers E, placed at unequal distances from the bottom of the trough, the pivoted guards F, the pivoted bridges G, connected with said guards respectively, the

ratchet-bars H, adapted, respectively, to support the rear ends of said bridges, and means connecting the tripping-levers with the ratchet-bars, respectively, whereby the forward motion of each tripping-lever releases the rear end of the corresponding bridge and depresses the corresponding guard, substantially as and for the purpose set forth.

6. The combination, with the trough A and the pivot e, journaled therein, of the levers E, formed with the longitudinal slots e' and bolts passing through said slots and adjustably connecting the levers with said pivots, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ALFRED AYER.

Witnesses:

I. CLANTON,
CHAS. F. BENSON.