(No Model.) 2 Sheets—Sheet 1.

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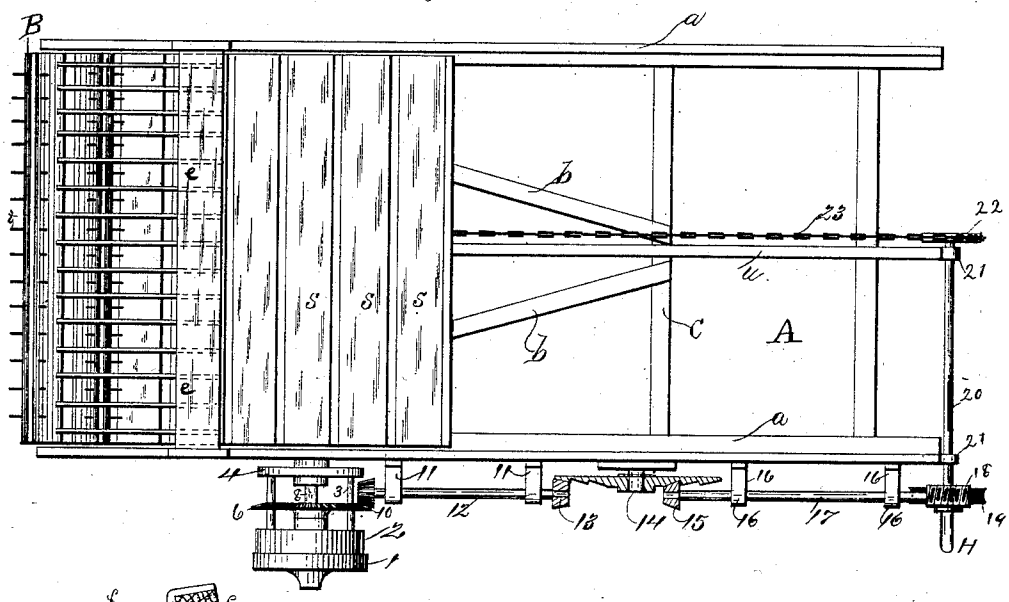
FERTILIZER DISTRIBUTER.

No. 374,155. Patented Nov. 29, 1887.

Fig. 1.



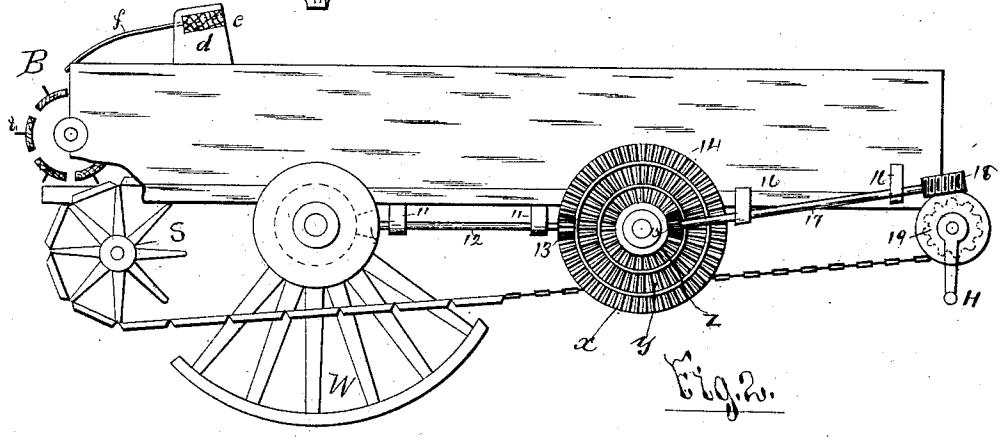


Fig. 2.

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Fig. 3.

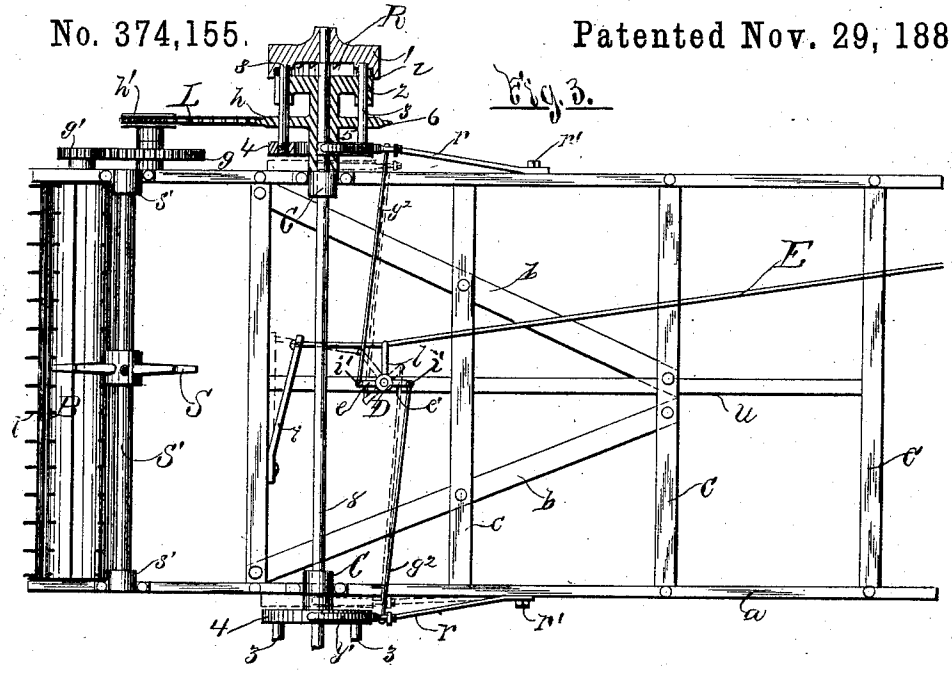


Fig. 4.

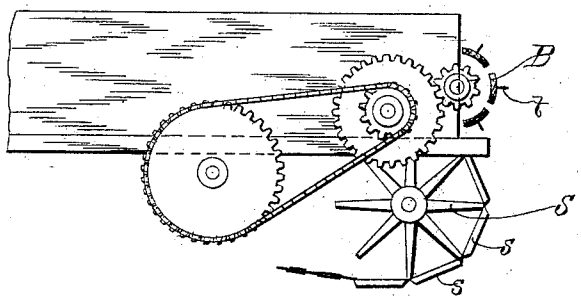
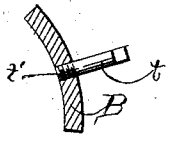


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM JOSLEYN, OF BEDFORD, QUEBEC, CANADA, ASSIGNOR TO A. L. JOHNSON, TRUSTEE, OF SYRACUSE, NEW YORK.

FERTILIZER-DISTRIBUTER.

SPECIFICATION forming part of Letters Patent No. 374,155, dated November 29, 1887.

Application filed February 28, 1887. Serial No. 229,138. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM JOSLEYN, of Bedford, in the Province of Quebec and Dominion of Canada, have invented new and useful Improvements in Fertilizer-Distributers, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to improvements in the class of machines termed "fertilizer-distributers," and has for its object the production of a simple, effective, strong, and durable machine for the desired purpose; and to this end the invention consists in the detail construction, arrangement, and combination of parts, all as hereinafter more fully described, and pointed out in the claims.

In specifying my invention reference is had to the accompanying drawings, like letters indicating corresponding parts in all the views, in which—

Figure 1 is a top plan of my improved fertilizer-distributer, illustrating the location and arrangement of the various parts and the construction and connection of the feed mechanism in plan view, the three-part central bevel-gear being in section for the purpose of better illustrating the contour of the same. Fig. 2 is a side elevation of my improved fertilizer-distributer, some of the parts being broken away to better illustrate the construction and arrangement of the same. Fig. 3 is an inverted bottom plan view, some of the parts being in section for the purpose of illustration. Fig. 4 is a side view of the back end of the machine, illustrating more particularly the actuating devices for the beater and parts connected therewith; and Fig. 5 is an enlarged detail view of the beater-teeth.

A represents the main body of my improved fertilizer-distributer constructed in the usual manner, the frame part thereof being composed of side sills, *a a*, Figs. 1 and 3, and central sill, *u*, and cross-pieces *c c c*.

In order to brace the frame laterally, I provide angular braces *b b*, Figs. 1 and 3, which are connected to the cross-pieces by bolting through, as best shown in Figs. 1 and 3, the object being to brace the frame laterally, and the construction illustrated and described accomplishes this desirable result.

In the construction of fertilizer-distributers heretofore used heavy timbers and corner bolts have been used to secure the frame against lateral displacement. I employ light timbers without corner bolts, merely bolting the cross-sills *c c* under the main sills *a a*, and prevent lateral displacement by the angular braces *b b*, secured to the frame of the body, as shown, which makes a very substantial frame and at a material saving in weight and cost.

The rear wheels, W W, constitute traction-wheels, which serve, in addition to their ordinary functions, to actuate the operating devices or mechanism of my improved fertilizer-distributer through the medium of connections attached to the hub and to the axle, and transmitting mechanism which will now be described. The hubs of the traction-wheels W W are constructed as best shown in Figs. 1 and 3. Upon the inner side of the hub 1, I provide ratchets R R, Fig. 3. Said hub 1 turns loosely on the axle 8. Upon the axle 8 I secure a collar, 2, which fits snugly within the projecting rim *v* of the hub 1, Fig. 3. The collar 2 is provided with holes or passages through which pass pins 3 3, the said pins engaging with the ratchets R R, as presently explained. The pins 3 are secured in the disk 4, Figs. 1 and 3, and the disk 4 is loosely mounted on the sleeve 5 of the collar 2, and has an in-and-out movement on the said sleeve. Between the collar 2 and disk 4, I provide a disk, 6, which upon one side of the machine is provided with a sprocket-wheel, *h*, and on the opposite side has a bevel-gear, the said disk 6 being rigidly secured to the sleeve of the collar 2, and serves to carry either a link-belt, L, upon one side of the machine or to drive the small bevel-pinion 10 upon the opposite side of the machine. The office of the pins 3 is to engage the ratchets R and thus connect the axle to the hub 1 of the traction-wheel, compelling the same to turn in the bearings C, affixed to the sills *a a* of the frame of the machine, and the revolution of the axle 8, as aforesaid, is utilized to actuate the feeding

mechanism of the machine, as will be hereinafter described.

In order to operate the pins 3 to effect the engagement of the pins with the axle, and thus throw the axle and its connecting devices into gear and thereby actuate them, I provide springs *r r*, secured at one end of a yoke, *y'*, which is attached to the pin-carrying disks 4 4, the opposite ends of the springs *r r* being attached at *r'* to the sills *a* of the frame. The springs *r* are connected by rods g^2 to the three-arm bell-crank D, journaled to the central sill or to a suitable support secured to the framework of the machine. The rods g^2 are connected to the short arms l' l^2 of the bell-crank, while the long arm *l* of the bell-crank is connected to the rod E, which in turn is connected at one end to the spring *i*, secured to the cross-bar of the frame, and its opposite end connected to the operating-lever which is controlled by the driver of the machine, and is attached in the usual manner with a latch-lock, as in other agricultural implements.

It will be observed from the described construction that as the pin-carrying disks 4 have an in-and-out movement on the sleeve of the collar 2, as the rod E is released by the hand-lever the spring *i* retracts the bell-crank, and as the bell-crank turns the springs *r r* are compressed and the pins 3 3 withdrawn from engagement with the ratchets R R, leaving the traction-wheels W W to turn independently on the axle 8.

As previously stated, the connection of the axle to the traction-wheels, so to turn therewith, is utilized to actuate the mechanism of the machine, and for this purpose I provide bearings 11, Fig. 1, secured to the sills *a* of the frame, and journal in the bearings a shaft, 12, provided on one end with beveled pinion 10, which meshes with the bevel-gear formed on the disk 6, Fig. 1, and receives motion from the gear on 6, as best shown in Fig. 1.

At the opposite end of the shaft 12, I secure a bevel-gear, 13, which meshes on the three-part gear 14 and communicates motion thereto. The three-part gear 14 consists of a gear having three series of teeth of the same circular pitch, but different diametrical pitch, the separate series of teeth being denoted, respectively, by the letters *x*, *y*, and *z*, the bevel-gear 13 meshing with the row of teeth marked *x*.

Motion from the three-part gear 14 is transmitted to the adjusting-shaft 17 by means of the bevel-gear 15, secured on one end thereof. and from thence transmitted by the worm 18 to the worm-gear 19, Figs. 1 and 2, the bevel-gear 15 being mounted on the shaft 17 adjustably, in order that it may be shifted to engage with either series *x*, *y*, or *z* of teeth in the three-part gear 14, the object being to change the speed of the feed, which varies according to the row of teeth that the pinion or bevel-gear 15 meshes with in the three-part gear 14.

In order to disengage the bevel-gear 15 from the teeth of the three-part gear 14, I attach the bevel-gear 15 to its shaft, so that it may be slipped back, and thus the gear 15 on the shaft 17 is shifted to the proper position to engage with the desired row of teeth in the gear 14 when the gear 14 is brought forward to mesh with the bevel-gear 15, and again tightened on its shaft.

It will be observed that the disk-gear 14, having a series of teeth formed thereon, forms an intermediary between the connecting and transmitting mechanism; that the connecting mechanism driven from the traction-wheel actuating the intermediary and the transmitting mechanism, consisting of the shaft 17 and its gears, transmitting the motion from the intermediary to the transverse shaft 20, which carries the worm and sprocket for actuating the floor, form, primarily, the feed mechanism, as stated, and that the intermediary 14 serves to vary or regulate the feed as desired by providing in itself the means for changing the speed, which consist in the series of teeth formed upon its face.

I have described how the change of feed is effected by shifting the pinion 15 to the different rows or fields of teeth on the intermediary, and it is simply necessary to state that the pinion 13 is also adjustably secured on its shaft and must be shifted to correspond with the series in the intermediary relative to that of the pinion 15 to accomplish the desired result.

In Fig. 2 I have shown the pinions adjusted on the intermediary for the slowest feed. Now, if it is desired to accelerate the feed, it is simply necessary to shift the pinion 13 to the field *y* of the intermediary. By shifting 15 to the field *y* the speed is further accelerated. By shifting 13 to the field *z* a still faster feed is obtained, and by again shifting 15 to the field *x* the fast feed of the mechanism is obtained. Thus it is seen that both sides of the intermediary are utilized in regulating the feed by shifting the pinions 13 and 15, as stated, to accomplish the desired result, and I thereby double the range of feed which could be attained by employing only one pinion.

I do not restrict myself to an intermediary with three fields of teeth, as any number can be employed.

The worm 18 transmits motion to the worm-gear 19, said worm-gear 19 being attached to the shaft 20, rotating in bearings 21, secured on the sills of the frame, as best shown in Fig. 1.

Upon the opposite end of the shaft 20, I attach a sprocket-wheel, 22, which carries the link-chain 23, and the link-chain 23 carries the moving floor of the machine.

It will be observed that the moving floor of the machine is composed of slats *s s s*, which are guided in their movements on the sill-pieces *a*, which, for this purpose, are either rabbeted or jointed, so as to leave guideways *a'*, Fig. 1, to support the ends of the slats.

At the rear end of the machine I mount upon the shaft S' a spider-idler consisting of a hub mounted on the shaft S', provided with

spokes projecting from the hub, as best shown in Figs. 2 and 4. The spokes, taking in the joints of the link-belt 23, serve to support and tension the moving floor as the slats tip in turning on the idler. The advantage of this spider-idler, which is merely a hub and spokes, as above described, over a wheel with a rim will be seen in the fact that when the greater portion of the load is discharged the rear portion of the moving floor is inverted and drawn toward the front of the machine, and particles of the fertilizer material are thrown over the front board and lodge on the inverted bottom. When returning the floor to its normal position, these particles wind in between the periphery of the wheel and the floor, blocking its movement and damaging the machine, whereas with the spider-idler they pass in between the spokes, and as the spider revolves fall to the ground without harm.

The travel of the floor is made sufficiently long to carry all the material of the load to the beater mechanism, which distributes it; and in order to reverse the movement when the floor has reached the end of its travel, I provide the crank H, secured to the shaft 20, carrying the worm-gear 19, which serves to retract the floor to its normal position, thus preparing the machine for another load of fertilizing material.

The object of connecting the feed so as to change the speed of it, for which purpose I provide the three-part gear 14, is to regulate the amount of fertilizer to be distributed to the acre, and it will be readily understood from a consideration of the foregoing how that object is effected by changing the speed of the feed, and the described means provide simple and effective devices for the desired purpose.

The beater mechanism consists of the cylinder B, which is located at the extreme rear end of the machine, as best shown in Figs. 2, 3, and 4, and the same is journaled on the shaft mounted in bearings secured in the frame of the machine.

In fertilizer-distributers of this class heretofore constructed the beater mechanism was located so as to bring the teeth above the plane of the main surface of the moving floor, and experience has shown that where the fertilizers were soft or stringy in their nature the beater so located would not freely discharge the fertilizer, and the material, after passing over the beater, would collect on the floor behind it and be carried out in quantities by the tipping of the moving floor as it turns on the rear cylinder, which proved detrimental to the crop and made the distributer inefficient in its operation. In order to overcome these defects and insure an even and regular discharge of the fertilizing material without regard to its condition, I locate the beater mechanism above and to the rear of the moving floor and depress the beater, so that its teeth project below the plane of the main surface of the floor, thus commencing the discharge action of the beater on the fertilizing material after the floor tips in moving around the rear spider. Thus it will be seen that the material as it moves up to the beater-teeth encounters the beater-teeth after the plane of the floor changes, and thereby the material is operated upon by the teeth and discharged clear of the moving floor. Thus it will be seen that by taking the material off from the bottom after it tips in its movement around the spider I am enabled to locate the beater sufficiently rearward to discharge the material clear of the bottom.

The beater-cylinder B is provided with teeth *t*, as best shown in the enlarged detail view, Fig. 5. The teeth *t* are provided with screw-shanks *t'*, by means of which the teeth are secured to the beater-cylinder, and their free ends are constructed flat or square, as best shown in the said figure.

The comb-board *e* is secured on the extensions *d d*, which are connected rigidly to the frame A, as best shown in Fig. 2, and the comb-board *e* is provided with the spring-teeth *f*, which are sufficiently elastic to yield freely and to work independently of each other, and in order to attain the necessary elasticity of the teeth the comb-board *e* is mounted farther forward on the machine and the teeth elongated, which secures the necessary spring. The teeth *f* come in close proximity to the teeth *t* of the beater, as best shown in Fig. 2, and the advantage accruing from this construction and arrangement of the comb-board over the old construction accrues from the fact that in the old construction the comb-board is provided with rigid teeth, while the board itself is yieldingly mounted on the body of the machine, and experience demonstrates that when the material is carried up to the comb-board it carries the comb-board bodily over either upon one side or the other, and renders its action unreliable, and is very apt to clog.

In my construction the comb-board itself, being rigidly secured to the body and mounted above, is out of the way of the material, while the long spring-teeth *f* yield independently of each other, thus making it absolutely impossible to clog, and at the same time holding an even pressure on the material, forming a very efficient and reliable device for the desired purpose.

The projections or standards *d d*, which support the comb-board, may be grooved at their upper extremities and the comb-board provided with tongues on its end, which take in the grooves in the standards and pins inserted through the standards into the comb-board, thus connecting the comb-board to the standards detachably, to remove the same when loading the body A with the fertilizing material.

The beater mechanism is operated from the sprocket *h*, formed on the disk 6 of the collar 2, as best shown in Fig. 3, the sprocket *h* being connected to the sprocket *h'*, secured on the bearing F by the link-belt L. The shaft

upon which the sprocket h' is journaled carries a gear, g, which meshes with the gear g', Figs. 3 and 4, on the beater-shaft and communicates motion to the beater.

The operation of my improved fertilizer-distributer will be readily understood from the foregoing and from an inspection of the drawings. The floor of the machine is moved forward, so as to cover the frame of the machine, and the fertilizing material is loaded into the body A, the rod E being released so as to disengage the pins from the ratchets R. The distributer is then driven to the field where the material is to be distributed, when the rod E is drawn forward by the driver and the hand-lever locked. This movement of the rod E permits the springs r r to throw out the pins 3, which engage the ratchets R, and the rotation of the traction-wheels W sets in motion, through the medium of the connected axle and transmitting mechanism, the moving floor, which in turn carries the fertilizing material to the discharging mechanism, consisting of the rotating beater B and the comb-board e, with its teeth f, until the load is discharged. The floor is retracted to its normal position by turning the crank H, and as soon as it is restored the machine is ready for another load.

I am aware that clutches operated by a traction-wheel and engaging the ratchet on a pulley revolving on the axle of grain-drills and the like devices have been heretofore employed; also, that such clutch devices consisted of bars and pins secured to a collar on the axle and projecting between the spokes of the traction-wheel in position to engage the ratchet of the revolving pulley mounted on the axle of the traction-wheel and operated by a lever, so that the bars or pins could be engaged or disengaged from the ratchet of the revolving pulley; hence I do not claim, broadly, the combination of a clutching device mounted on the axle and operated in conjunction with the traction-wheel for the purpose of utilizing the traction-wheel to operate a feed mechanism.

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

1. The combination of a traction-wheel loosely mounted on its axle, having a ratchet on its hub, with a collar rigidly secured to the axle, and a disk loosely mounted on the sleeve of the collar, carrying pins passing through the collar to engage the ratchet and turn the axle with the revolution of the traction-wheel, substantially as and for the purpose set forth.

2. The combination of a traction-wheel having a hub provided with a ratchet, with engaging-pins movably mounted in a support secured to the axle and operated, substantially as described, to be engaged or disengaged with the ratchet to turn or release the axle, substantially as and for the purpose set forth.

3. The combination of the ratchet secured on the hub, the collar secured to the axle, having holes for the pins to pass through, the pins secured to the disk mounted movably on the collar, and the spring for holding the pins into engagement with the ratchet, substantially as and for the purpose set forth.

4. The combination of the ratchet secured on the hub, the collar secured to the axle, having guide-holes or passages for the pins, the sprocket or gear secured to the sleeve thereof, and the movably-mounted disk 4, carrying pins 3 3, substantially as and for the purpose set forth.

5. The combination, in a fertilizer-distributer, of the beater mounted above and to the rear of the moving floor, the beater being depressed so that its teeth project below the plane of the main surface of the floor to operate on the fertilizer as the slats of the floor tip in moving around the spider-idler and the moving floor, substantially as and for the purpose specified.

6. The comb-board e, mounted rigidly above the distributer-frame forward of the beater and provided with elongated spring-teeth deflected rearwardly, substantially as and for the purpose set forth.

7. In a fertilizer-distributer, the combination of the moving floor actuated at the forward end by a sprocket-wheel connected by a worm and gear to a variable-feed mechanism consisting of an intermediary disk-gear provided with several fields of gear-teeth, said intermediary being driven from a bevel-gear secured to the axle, substantially as and for the purpose set forth.

8. The beater-teeth t t, having a screw-shank for attaching them to the beater-cylinder and their free ends flat or square, substantially as and for the purpose set forth.

9. The combination of the pins 3 3, disks 4 4, springs r r, connected by rods g^2 g^2 to the bell-crank D, the bell-crank D, having arms l l' l^2, and the rod E, connected to the crank-arm l and to the spring i, substantially as and for the purpose set forth.

10. The combination of the bevel-gear 6, secured on the axle 8, with the intermediate gear, 14, the shaft 12, having gears 10 and 13, the intermediate gear, 14, being connected to the shaft 20 by gear 15 on shaft 17, and the worm and gear 18 19, substantially as and for the purpose set forth.

11. The combination of the gear 6 with the intermediate gear, 14, and with suitable connections, substantially as described, for transmitting motion from the traction-wheel W to the moving floor of the machine, substantially as and for the purpose set forth.

12. The combination of the gear 6 and its connections with the intermediate disk-gear, 14, for varying the rates of feed, and shaft 17 and its connections, substantially as and for the purpose set forth.

13. The combination of an intermediate disk-gear having a series of teeth of varying diametrical pitch, and pinion-gears upon opposite sides thereof, connected, respectively, to the axle actuated by the traction-wheel and to

the actuating-feed mechanism for operating the moving floor, whereby both sides of the intermediate gear are utilized to regulate the speed of the feed mechanism, substantially as and for the purpose set forth.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 26th day of February, 1887.

WILLIAM JOSLEYN.

Witnesses:
FREDERICK H. GIBBS,
H. E. CHASE.