No. 820,030. PATENTED MAY 8, 1906.

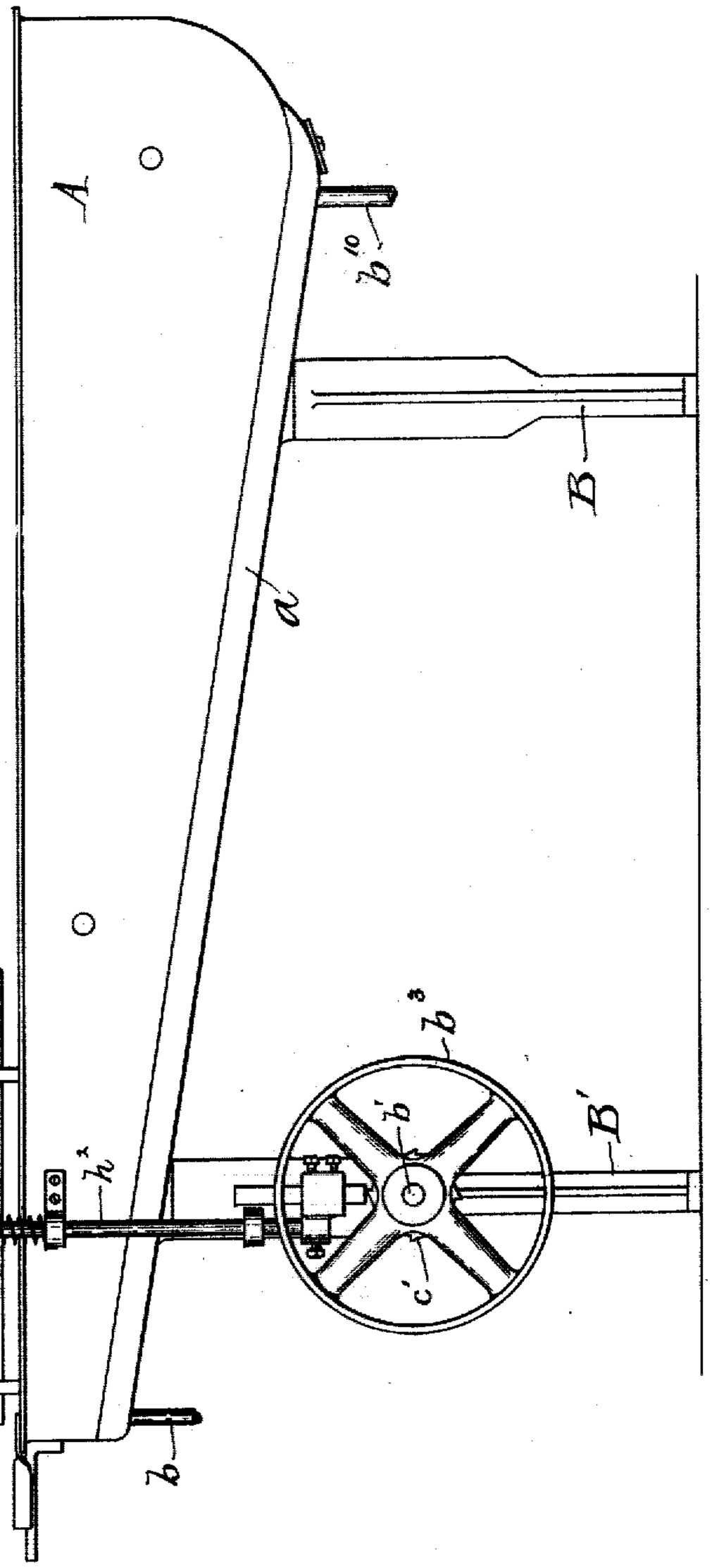
W. H. WEEKS.

MACHINE FOR COATING CONFECTIONERY.

APPLICATION FILED FEB. 9, 1906.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

H. H. Leanby.

A. M. Biddle

INVENTOR

William H. Weeks

BY

H. A. Heaton

ATTORNEY.

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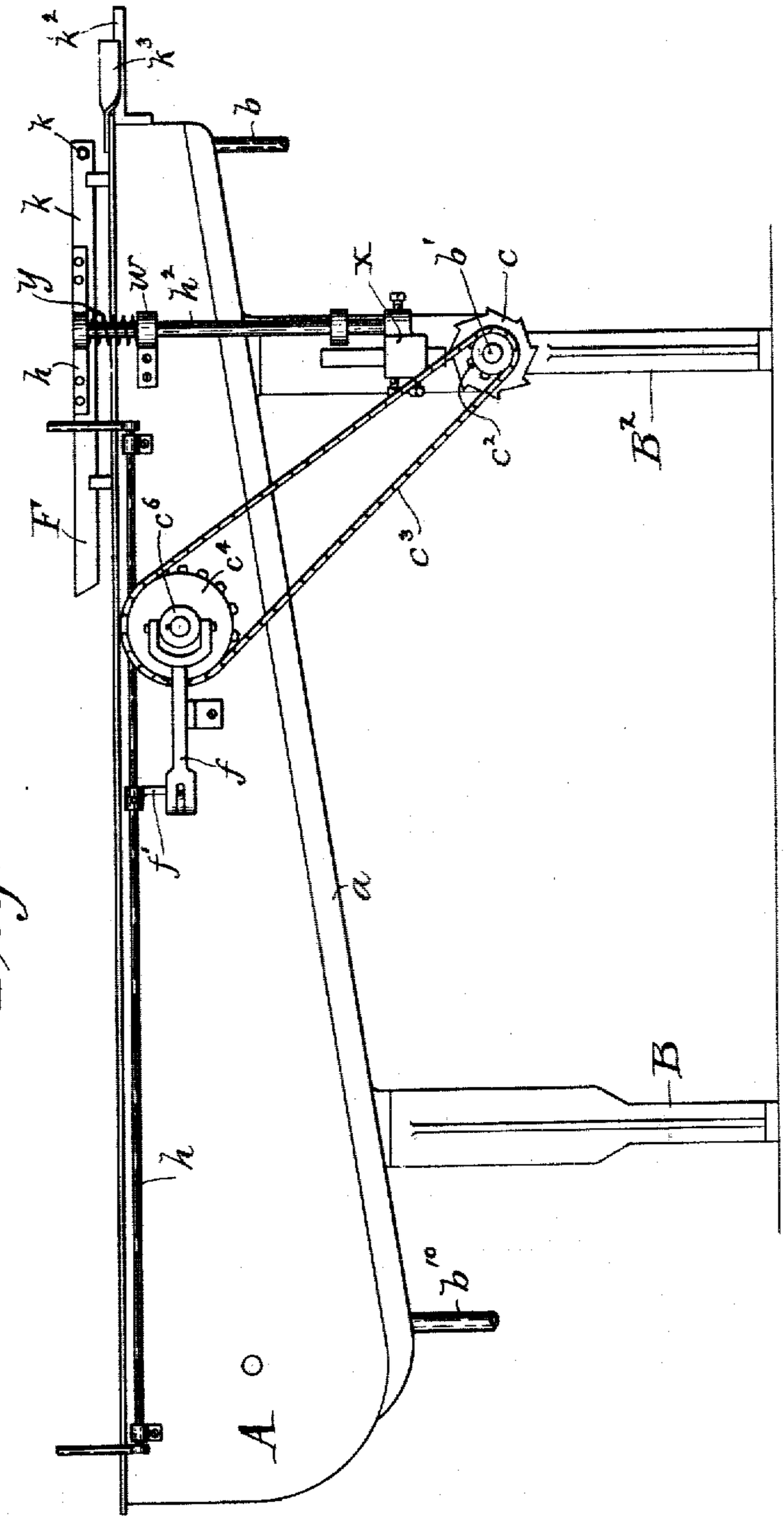
3 SHEETS—SHEET 2.

Fig. 2.



WITNESSES:

H. H. Leamby.

A. M. Riddle

INVENTOR

William H. Weeks

BY

H. J. Hauton

ATTORNEY.

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3 SHEETS—SHEET 3

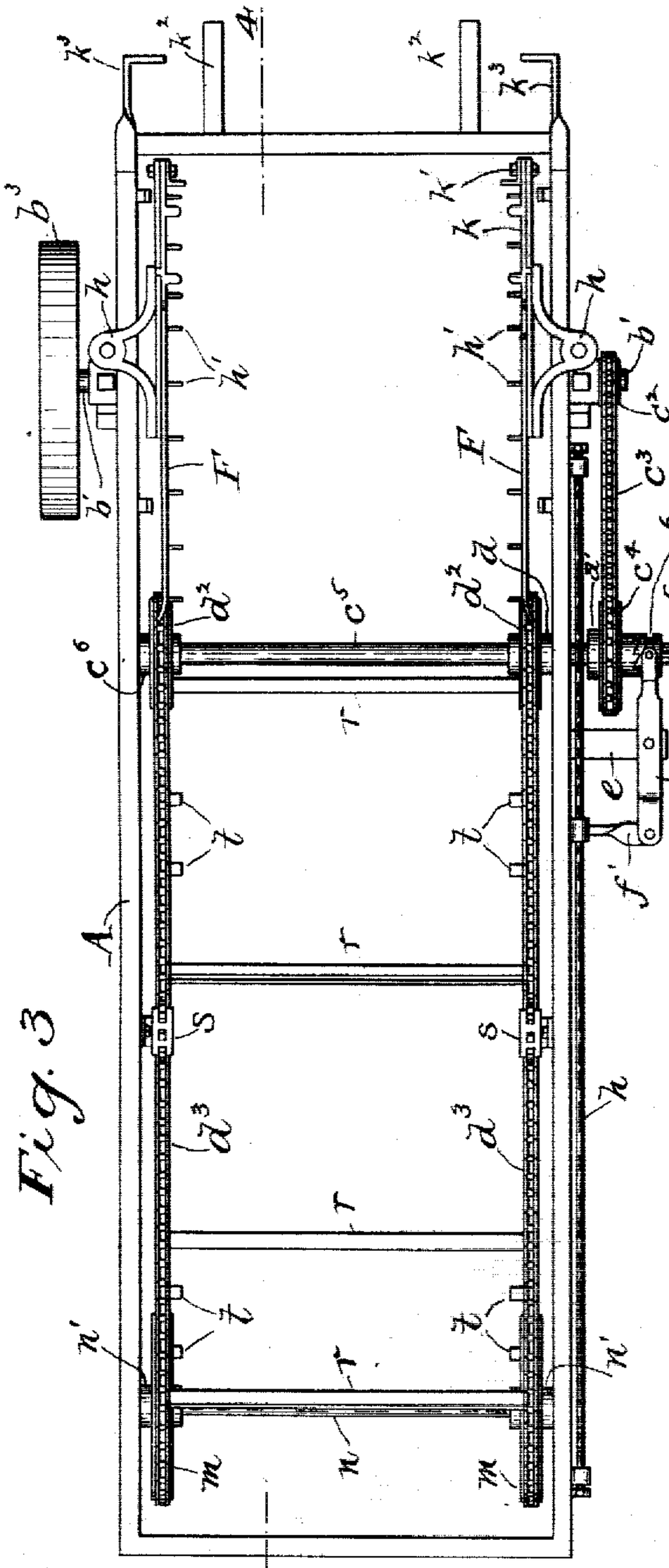

Fig. 3

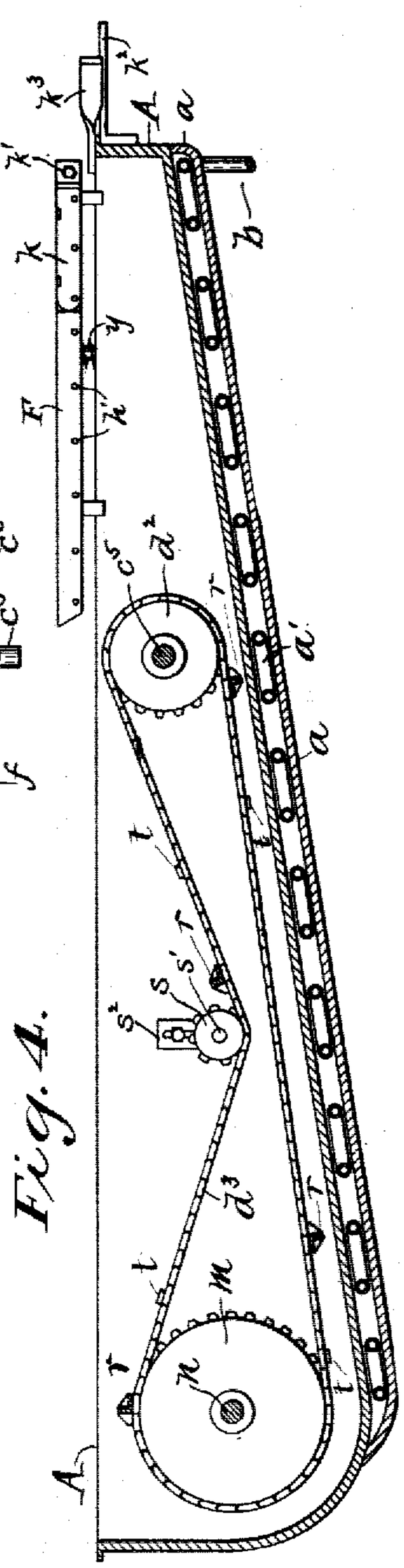

Fig. 4.

WITNESSES:

H. H. Leamy.

A. M. Biddle

INVENTOR

William H. Weeks

BY

H. V. Heuton

ATTORNEY.

UNITED STATES PATENT OFFICE.

WILLIAM H. WEEKS, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR COATING CONFECTIONERY.

No. 820,030. Specification of Letters Patent. Patented May 8, 1906.

Application filed February 9, 1906. Serial No. 300,214.

To all whom it may concern:

Be it known that I, WILLIAM H. WEEKS, a citizen of the United States, residing in the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Machines for Coating Confectionery, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to machines for coating cream drops, caramels, candy-cores, or other filling material with chocolate or other soluble coating substance which will solidify on exposure to air.

Heretofore such machines have been constructed of two leading types, in one of which the core-supporting device is a fixed element of the dipping mechanism, and the vibrating mechanism to shape off the surplus coating after dipping is a like fixed element of both, capable only of acting on the core-supporting element, through the dipping mechanism of which it forms an inseparable part, while in the other type of such machines the core-supporting element is a detachable element mechanically distinct from both the dipping and vibrating elements, while the vibrating element is also mechanically and operatively distinct from both. In both these types of machines, requiring a dipping of the core or filling below the surface of the coating solution in the tank, it has heretofore been deemed essential that the dipping mechanism carrying the core-supporting tray should be reciprocated in a strictly perpendicular plane, this characteristic principle of construction and operation requiring complicated mechanism above the solution-tank to actuate and guide the reciprocating dipping mechanism in its up and down movement and, moreover, necessitating the employment of screens hinged on the dipping mechanism to cover the open top of the core-supporting tray, with mechanism to operate such screens to prevent the cores floating out of the tray into the solution on the downward reciprocatory movement into the tank.

The first referred to type of these machines is described in Letters Patent No. 492,205 to Holmes and No. 533,974 to Walter, while the second referred to type is described in two several Letters Patent granted to me, Nos. 634,633 and 689,067. These two types of machines differed in principle from each other also in that in the first referred to the core-supporting tray formed an integral part of the dipping mechanism and was incapable of removal therefrom for the purposes of filling with cores, jarring off the surplus coating, and of discharging the coated cores. Hence the vibrating and discharging mechanism necessarily formed a combined element of the dipping mechanism in the unitary machine, while in the latter or second referred to type of machines, though the principle of perpendicular dipping was characteristic thereof, the core-supporting tray was complete in itself, detachable from the dipping-frame for filling, vibrating, and discharging. Hence there was mounted on the frame of said last-mentioned type of prior machines conveniently adjacent to the dipping mechanism and over the solution-tank a vibrating and reversing frame, and this latter feature I have retained in substance in my present machine about to be described. As before stated, both these types of prior machines of this class comprise more or less complex mechanism, due largely to the basic principle involved in them of a perpendicular dipping.

The objects sought for and attained in my present invention are the simplification of the dipping mechanism and the avoidance of the former complex actuating and guiding devices therefor, the avoidance of necessity for a hinged cover for the core-supporting tray and means to swing it over and from the tray before and after dipping the provision of means to automatically remove the filled tray after dipping from the dipping mechanism onto the receiving, vibrating, and discharging frame, and, finally, the provision of a solution-tank of such character that a much less depth of coating solution is required and wherein the solution will consequently tend to flow by gravity to that end thereof where the core-filled dipping-tray initially enters the solution and away from the opposite end thereof, over which the receiving, vibrating, and discharging frame is located.

I have found from practical tests that at least for machines not too large in size the principle of perpendicular dipping is not at all essential and that a most effective and simple device can be constructed and operated on the principle of a horizontal movement of the dipping-frame, effecting a downwardly-inclined sidewise dipping of the core-

supporting tray, and my present invention involves as its basic feature mechanism constructed and operating on that principle of dipping the core-supporting tray. I have also found that such principle of dipping effected by the hereinafter-described construction and arrangement of the movable dipping-frame, means to actuate it, and means to guide it in such movement into, through, and out of the solution-tank will obviate the necessity for any cover for the removable core-holding tray and also that the latter may be operatively supported thereon during dipping solely by gravity, due to its weight, and, moreover, by appropriate arrangement of the tray receiving, vibrating, and discharging frame relatively to the solution-tank and the moving dipping-frame and its actuating devices each tray in the series will after dipping be automatically discharged from the moving dipping-frame as it is brought into horizontal parallelism with the tray receiving and discharging frame.

To these ends my invention consists, essentially, of the combination of the following elements, constituting a machine of the class recited—namely, a solution-tank which is preferably a substantially oblong rectangular structure with a horizontally-inclined basal interior and a double bottom for hot water, a pair of transversely-mounted shafts within the tank and a pair of endless chains between the same, means to rotate one of said shafts as a main driving-shaft for the unitary machine, means mounted upon each of said chains and constituting a dipping-frame adapted to removably support by gravity a series of detached core-supporting trays, guiding devices on the inner face of the opposite vertical walls of said tank operating to direct the path of movement of the traveling dipping-frame in a horizontally-inclined direction first downwardly and then upwardly, a receiving-frame mounted over the shallow end of the tank and in such relation to the movable dipping mechanism that on the terminus of the upwardly-inclined travel thereof in respect of each tray supported thereon the latter will be brought into horizontal parallelism with said receiving-frame and be automatically discharged thereupon.

My invention also comprises mounting said receiving-frame upon a pair of vertical rods substantially parallel with the exterior walls of the tank, means to reciprocate the vertical rods substantially parallel with the exterior walls of the tank, means to reciprocate the vertical rods of said receiving-frame to cause it to operate as a shaking-table, and means constituting a divided and hinged outer end of said frame to reverse the tray and discharge its contents.

In the drawings illustrating my invention, Figure 1 is a side elevation of the solution-tank, the receiving and vibrating frame, and some other adjunctive parts of the machine. Fig. 2 is a like view from the opposite side of the machine. Fig. 3 is a plan view of the machine, and Fig. 4 is a vertical section on the line 4 4 of Fig. 3.

Referring now to the drawings, Figs. 1 and 2, A is an open-topped tank to receive the coating solution. It is substantially rectangular in planular outline and is provided with a double bottom, the hollow space a providing means to hold a supply of hot water delivered to it from perforated pipes a' within the same supplied from pipes b or other suitable source to keep the chocolate or other solution in proper liquid condition suitable for coating purposes. The supply b is preferably placed at the rearward or shallow end of the tank and a suitable overflow-pipe b^{10} at its opposite or deep end, as indicated in Figs. 1 and 2. The tank A is constructed with a horizontally-inclined bottom in order primarily to cause a constant tendency of the contained solution to flow by gravity from the shallow end to the deeper end and to leave the former part of the tank comparatively free from solution for the twofold purpose of enabling the tray-receiving frame to be located over the shallow end of the tank and adjacent to but rearward of the path of travel of the dipping-frame and in order that such path of travel shall be in a plane below the top edge of the tank and insure a submersion of the dipping-frame within the coating solution contained therein.

The solution-tank A is suitably supported above the factory floor, such as by standards or legs B B′, Fig. 1, on one of the long sides and by like means B B², Fig. 2, on the other of the long sides. The standards B′ B², which are opposite each other, are utilized as bearings for the main driving-shaft b', which extends through said standards, and on the end thereof which extends through the standard B′, Fig. 1, is mounted the driving-pulley b^3, driven by a belt. (Not shown.)

On the opposite side of the machine on the extreme end of the driving-shaft b', which extends through the opposite standard B², Fig. 2, is mounted a sprocket-wheel c^2, which drives an endless chain c^3, which in turn drives another sprocket-wheel c^4. The latter is mounted on a shaft c^5, which is the driven shaft of the dipping-frame. (See Fig. 3. Said shaft c^5 has its bearing at one end in a journal c^6, set into the interior face of one of the vertical walls of the tank A, while the other end (on which the sprocket-wheel c^4 is mounted) passes through a stuffing-box c in the opposite wall of the tank, a hub d' for said sprocket-wheel c^4 being mounted sleeve-like on the projecting end of said shaft b', said hub having its head end provided with ratchet-teeth. An annularly-grooved collar c^6, provided with corresponding teeth, is mounted on the outer ex-

tremity of the shaft b' and is controlled by a connecting and disconnecting lever f, pivoted on a bracket e, the free end of the lever being connected by arm f' with controller-bar h, a longitudinal movement of which stops or starts the machine by connecting or disconnecting the described actuating elements.

Mounted fast on the said shaft c^5 within the tank and adjacent to the vertical walls thereof are oppositely-disposed sprocket-wheels d^2 d^2, each of which drives an endless chain d^3 d^3, which in turn drives another pair of oppositely-disposed sprocket-wheels m m, mounted fast on a shaft n, extending transversely through the tank at the deep end thereof and which is journaled at each end in a journal-hub n' n', set into the inner face of each vertical wall of the tank. The two pairs of sprocket-wheels d^2 d^2 and m m should be proportioned in size relatively to the deep and shallow parts of the tank in order that a core-holding tray which is initially placed upon the dipping-frame over the larger sprocket-wheels m will be slightly above the solution in the tank, while at the point above the smaller sprocket-wheels d^2 a core-holding tray resting on the endless-chain dipping-frame will be not only wholly above the solution in the tank, but be brought at that point into horizontal parallelism with the receiving-frame N, so that the next recurring movable tray carried to that point by the endless-chain dipping-frame will automatically push the previous tray forward on the receiving-frame, and so on for each tray in the series.

The dipping-frame consists of the oppositely-disposed parallel endless chains d^3 d^3, connected at suitable intervals by one or more cross-bars r, preferably in the form of angle-irons, adapted to support and bear against the edge of a core-holding tray, and upon said chains are mounted inwardly-projecting lugs t t, adapted to support the opposite edge of the tray. These trays are now well known in the art and are usually constructed of wire, being essentially a wire frame rectangular in planular outline and with two sets of intermediate wires crossing each other and bent at the intersections to form core-holding pockets of various shapes. Examples of such trays suitable to be used with my new machine may be found described in German Patent to Reiche, No. 18,943, dated December 11, 1881, and United States Letters Patent No. 634,633, dated October 10, 1899, and No. 684,147, dated October 8, 1901, both granted to me.

The series of angle-iron cross-bars r and inwardly-projecting lugs t, arranged in pairs at suitable intervals on the endless chains d^3 d^3, are well adapted to support and maintain in position solely by gravity and their weight the filled core-holding trays during the passage of both through the coating solution in the tank and freely permit the tray to be slid off the same onto the receiving-frame, while the vertical portion of the angle-bar r, carried forward by the moving dipping-frame, operates by a pushing contact against the detached tray to slide it off the dipping-frame and onto the receiving-frame, while the next succeeding tray brought to the same position by the dipping-frame displaces the preceding tray on the receiving-frame, pushing it forward to the pivoted discharge end thereof, as hereinafter described.

Guiding devices to direct the requisite path of movement of the endless-chain dipping-frame consist of a pair of oppositely-disposed wheels s s with sprocket-pins or other like devices on the periphery to mesh with the open links of the sprocket-chains d^3 d^3, these wheels s s being mounted rotatably on short shafts s', having bearings in an adjustable slotted plate s^2, secured to the inner walls of the solution-tank. (See Fig. 4.) These wheel-guides are placed above the upper section of the endless chain and in such relation to the sprocket-wheels m and d^2 and to the tank as to carry the upper section of the chains first in a downwardly-inclined direction and then in an upwardly-inclined direction, while the connecting and supporting bars r r operate also as guides by preserving the parallelism of the endless chains d^3 d^3 and prevent any sagging thereof, although the trays resting on the projecting lugs t t and bars r r aid to some extent in producing that effect.

In constructing, combining, and arranging within the tank the movable dipping-frame and its actuating mechanism above described said elements are to be located within the tank toward the forward end thereof and within the comparatively deep portion thereof and are of such size and character as to bring the tray-receiving end of the movable frame slightly above the maximum height of the solution in the tank and also to leave the interior of the rearward or shallower end of the tank unoccupied by any part of the same, as the tray receiving and discharging frame is to be located on the tank over said shallow end thereof, whereby several objects are accomplished—namely, the core-holding trays after filling with cores to be coated are placed by hand on the dipping-frame at its highest point and above the solution, are carried thence in a sidewise but downwardly-inclined direction through the solution until in succession they reach the opposite terminus of travel of the dipping-frame, which thereby brings each dipped tray into a position adjacent to and in the same horizontal plane with such receiving-frame and in position to be discharged thereon, as hereinafter described. The drippings from the tray and its contents while temporarily resting on the ceiving-frame will drop into the tank below and tend

to flow by gravity into the main body of the solution and toward the deep end of the frame, and this construction, proportion, and arrangement of the dipping-frame and its actuating mechanism and of the tank will leave the forward or shallow end of the tank comparatively free of solution beneath the tray receiving and discharging frame. The said frame N is primarily a tray-receiving frame; and it consists (see Fig. 3) of a pair of oppositely-disposed flat bars F F, supported edgewise on brackets *h h*, these latter being respectively mounted on a pair of vertical rods h^2 h^2 (see Figs. 1 and 2) outside of and parallel with each other and with the vertical side walls of the tank, these rods being mounted, respectively, on the standards B′ and B^2. On the inner face of each frame-bar F is a series of projecting pins or lugs *h′*, adapted to receive and support the core-holding tray, while the receiving ends of the frame-bars are slightly curved outwardly by preference to afford no obstruction to the tray while it is being slid onto the pins or lugs *h′* of the frame.

It is essential to the successful coating of such cores that means be provided to vibrate the core-supporting tray with the coated cores thereon after dipping in order to shake off the surplus coating and give a smooth exterior surface to the coated core, and it is further essential that means be provided to invert the filled core-supporting tray after such vibrating, to remove the coated cores from the tray, they being then in more or less soft and moist condition and incapable of removal by hand. To accomplish these ends, the trays as delivered upon the aforesaid receiving-frame are to be removed to and placed upon a jarring and discharging frame, such as that described in aforesaid Letters Patent No. 634,633, granted to me, and such a frame may be readily mounted upon rearwardly-extending brackets secured to the end wall of the tank, so as to support such jarring and discharging frame directly in the rear of and in the same horizontal plane with the receiving-frame F for convenience in sliding the trays from one frame to the other. I prefer, however, to add appropriate mechanism, as shown in the drawings, to enable the receiving-frame F to perform the additional functions of jarring the tray and discharging its contents. This is accomplished by the provision of a guide-bracket *w*, fixed on the tank-wall, and the provision of a coiled spring *y*, having its bearing between the said guide-bracket *w* and the frame-bracket *h*. The weight of the filled tray is sufficient to slightly compress the spring and depress the supporting-rod h^3, the lower end of which is adjustably secured in a contact-sleeve *x*, which is normally held by the spring *y* slightly above the points of a ratchet-wheel *c′*, mounted fast upon the shaft *b′* between the face of the standard B^2 and the sprocket-wheel c^2. (See Fig. 2.) A like construction and combination of elements is arranged upon the opposite side of the machine. (See Fig. 1.) Compression of the spring and depression of the vertical rods h^2 will cause the contact-sleeve *x* to bear upon the points of the ratchet-wheel *c′* and cause a vertical vibration of the core-holding tray for the few seconds that it is resting on the receiving-frame F, which is thus temporarily converted into a vibrating frame. Means are provided to convert the rearward portion of the receiving-frame F into a discharging device, these means consisting of a short flat bar *k*, placed edgewise inside of and parallel with the frame-bar F, the two being hinged together at *k′* at their extreme ends, so that when the tray is slid back upon such hinged portion the latter and the tray supported thereon may be inverted to discharge the coated cores upon a board or other receiving means supported temporarily upon brackets, such as k^2, and prevented from sidewise displacement by means such as brackets k^3.

The operation of the machine will probably be well understood from the foregoing description of its construction, but may be briefly stated as follows: The endless-chain dipping-frame, provided with a series of pairs of tray-holding bars and lugs, each tray as filled with cores to be coated, is fed to the machine by placing it upon the highest point of the dipping-frame, which is over the sprocket-wheel *m* and above the solution in the tank. A series of such trays is therefore carried successively into the solution in a downwardly-inclined direction and finally brought up to a point over the smaller sprocket-wheel d^2, at which point it is in the same horizontal plane with the tray-receiving frame F. As the trays rest by gravity only on the endless-chain dipping-frame, each tray as it is brought thereby to a point over the smaller sprocket-wheel d^2 will be pushed forward by the bar *r* of the moving dipping-frame and be automatically slid forward off the moving dipping-frame and onto the tray-receiving frame, where its weight thereon will cause said frame to be vibrated momentarily by the means before described, while the next succeeding tray to be delivered onto the receiving-frame will push the preceding one onto the jointed rearward end of such frame, where it can be inverted and its contents discharged.

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

1. In a machine for coating cores by a sidewise dipping, the combination with a suitable solution-containing receptacle, of a movable dipping-frame adapted to support and carry a detached core-holding tray, means to direct the path of movement of said dipping-frame through the solution-receptacle in a

downwardly and then an upwardly inclined horizontal direction, and a tray-receiving frame mounted upon the solution-receptacle and in such relation to the movable dipping-frame that the latter will be brought into horizontal parallelism with the tray-receiving frame and automatically discharge the dipped tray thereon.

2. In a machine for coating cores by dipping them into a coating solution by a downwardly-inclined horizontal dipping of the core-holding tray, the combination with a suitable solution-receptacle having an inclined basal interior, of a movable dipping-frame therein adapted to support a series of detached core-holding trays, a tray-receiving frame mounted over and near the shallow end of the receptacle, actuating and guiding devices operating to carry the dipping-frame and the trays supported thereon into, through and out of the solution in the receptacle in an inclined horizontal direction, and bring each tray, after dipping, into position adjacent to and in the same horizontal plane with the tray-receiving frame and automatically discharge them successively thereon.

3. In a machine for coating cores by dipping, the combination of the following instrumentalities, namely a solution-receptacle of substantially oblong rectangular form in planular outline and having an inclined basal interior, a tray-receiving frame mounted over the shallower end thereof, a movable dipping-frame comprising a pair of oppositely-disposed endless chains carrying connecting-bars and projecting lugs adapted to support and discharge a detached core-holding tray, and actuating and guiding devices for the dipping-frame adapted and operating to receive said tray thereon at the deep end of the solution-receptacle, carry it in a downwardly-inclined direction through the solution, and bring it therefrom into horizontal parallelism with said receiving-frame and automatically discharge it thereon.

4. In a machine for coating cores by dipping, the combination with a substantially oblong rectangular solution-receptacle having an inclined basal interior, of means to dip the cores therein in an inclined horizontal direction, said means consisting of a pair of transversely-disposed shafts within the receptacle carrying oppositely-disposed sprocket-wheels, a pair of endless chains driven thereby, guiding devices within the tank operating to control the direction of movement of said chains, first in a downwardly-inclined and then in an upwardly-inclined direction, devices mounted upon said chains adapted to support thereon a series of detached core-holding trays, by gravity, and a tray-receiving frame mounted upon the rearward end of said solution-receptacle, adapted to receive said trays successively discharged from the endless chain on the terminus of their upwardly-inclined travel.

5. In a machine of the character recited, the combination with a solution-receptacle having an inclined basal interior, a tray-receiving frame mounted over the shallower end thereof, an endless-chain dipping-frame mounted and operating within the deeper portion of the receptacle and forward of the tray-receiving frame, means to removably support thereon one or more detached core-holding trays, means to actuate said chain dipping-frame, consisting of a pair of oppositely-disposed sprocket-wheels at the extreme deep end of the tank, a shaft therefor, another pair of oppositely-disposed sprocket-wheels parallel with those first recited, a driven shaft upon which the same are mounted, means to drive said shaft, means to connect and disconnect said shaft with the driving means, and guiding devices within the tank operating to direct the path of movement of the dipping-frame in an inclined horizontal direction.

6. In a machine of the class recited, comprising a solution-receptacle, a movable dipping-frame adapted to support a detached core-holding tray, and means to direct the path of movement of said dipping-frame through the coating solution in a horizontally-inclined direction and automatically discharge therefrom the supported tray after dipping, of a yieldingly-supported tray-receiving frame mounted over the solution-receptacle rearwardly adjacent to and in the same horizontal plane with the discharge end of the dipping mechanism, vibrating devices with which said yieldingly-supported frame is operatively engaged by a weight or load on the frame, and a supplemental tray-receiving frame hinged to the main frame and adapted to support and invert a core-holding tray slid thereon from the main frame.

In testimony whereof I have hereunto affixed my signature this 3d day of February, A. D. 1906.

WILLIAM H. WEEKS.

Witnesses:

ALFRED ROSENSTEIN,

A. M. BIDDLE