

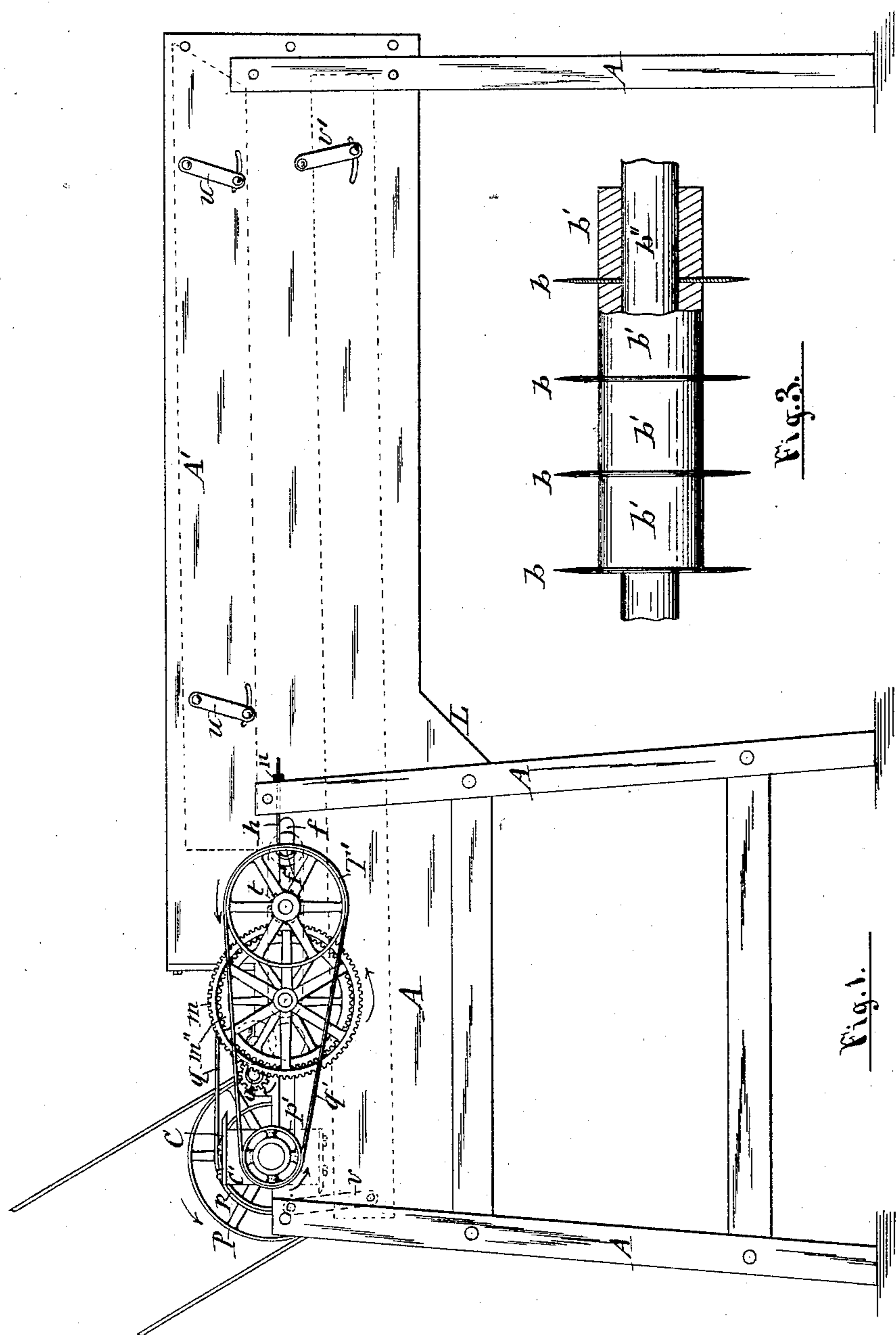
(No Model.)

4 Sheets—Sheet 1.

G. LE CLAIR.
TOBACCO CUTTING MACHINE.

No. 370,953.

Patented Oct. 4, 1887.



Witnesses.

A. P. DENISON
C. BENDIXON

Inventor.
George Le Clair
By *Hull, Lassar & Hull*
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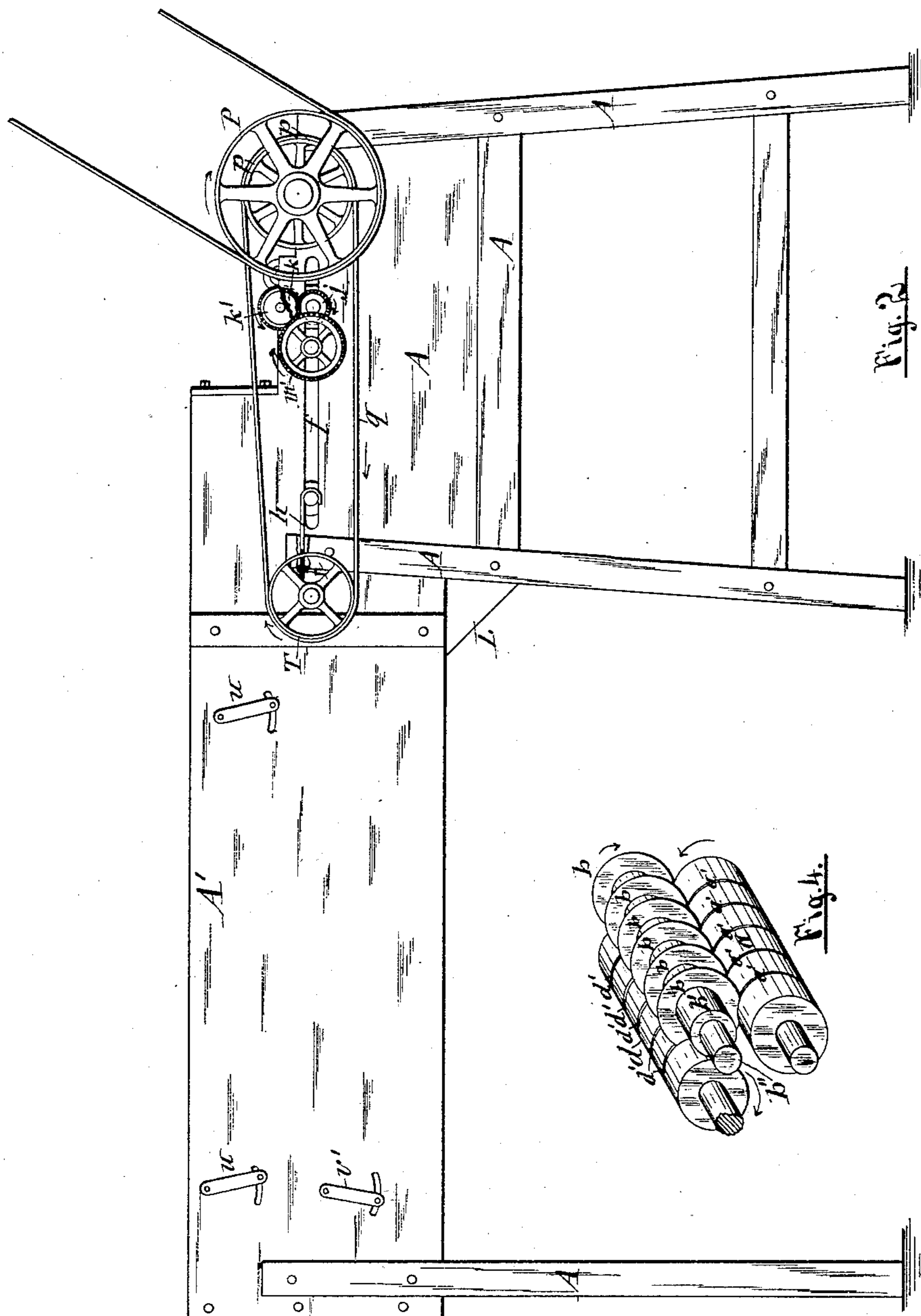
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4 Sheets—Sheet 3.

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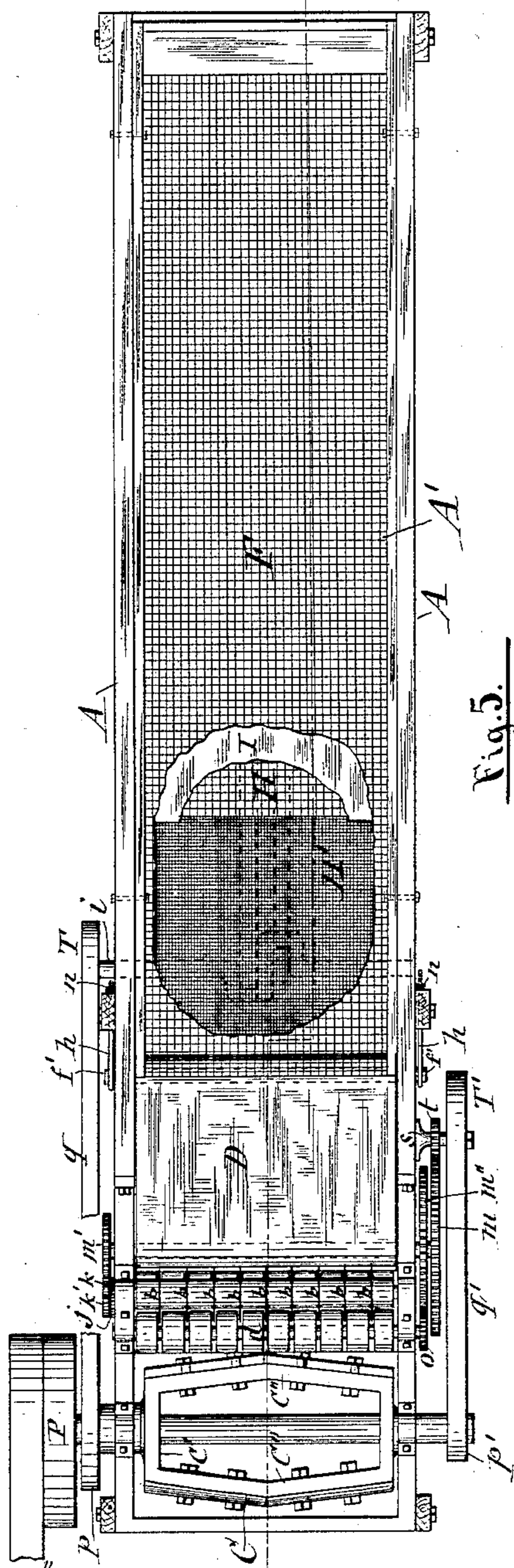


Fig. 5.

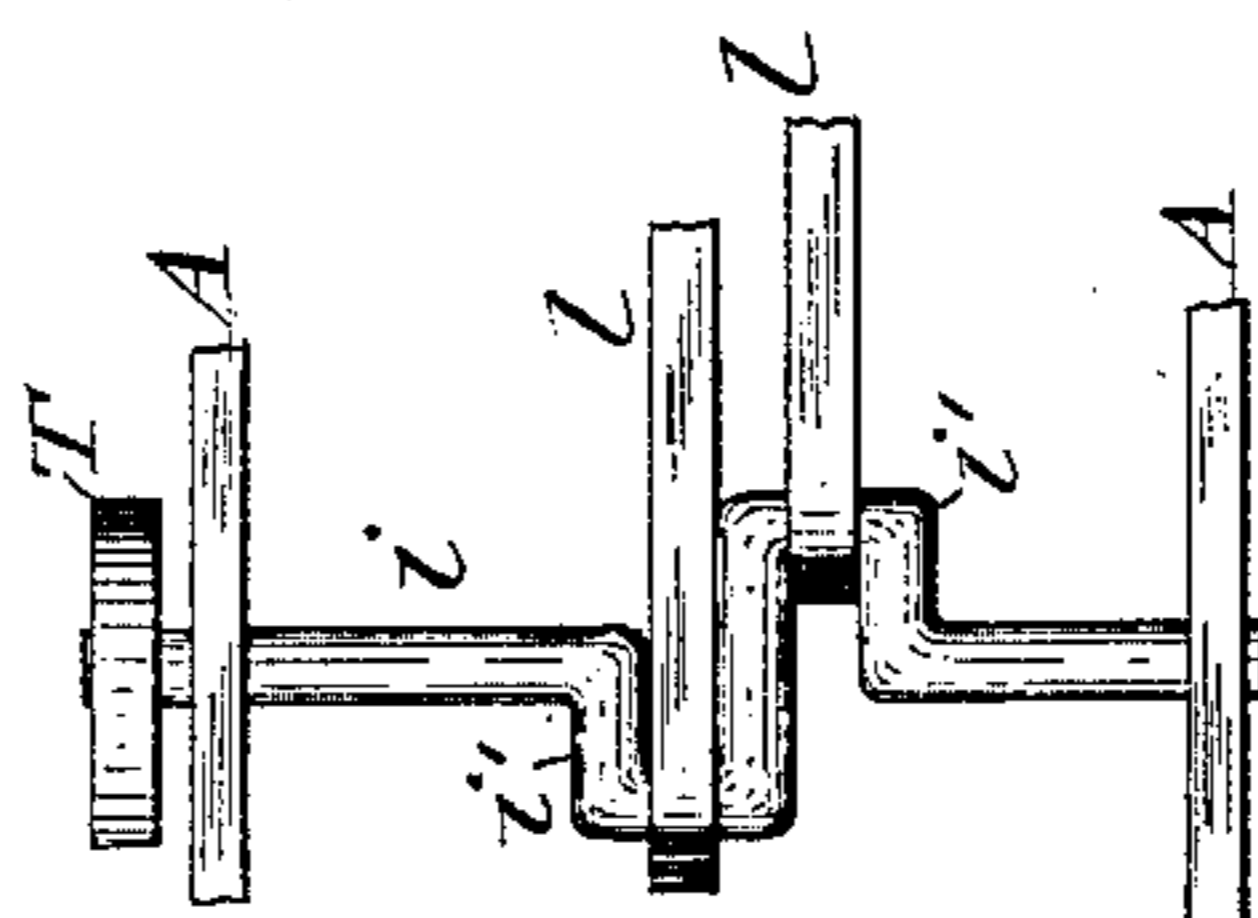
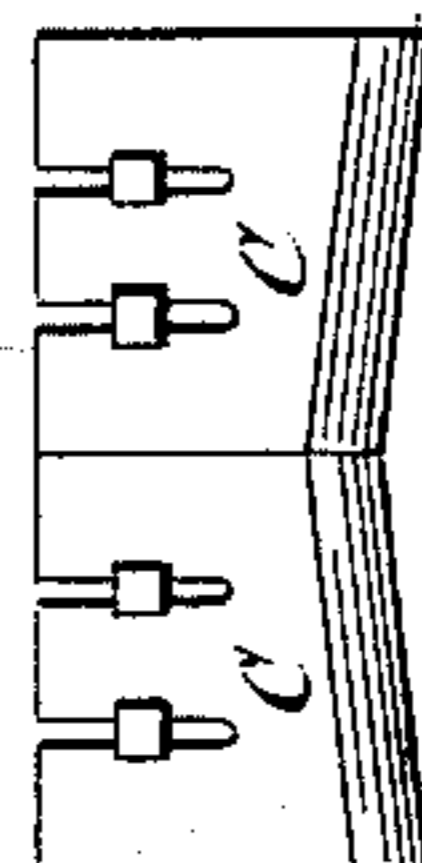


Fig. 10



High

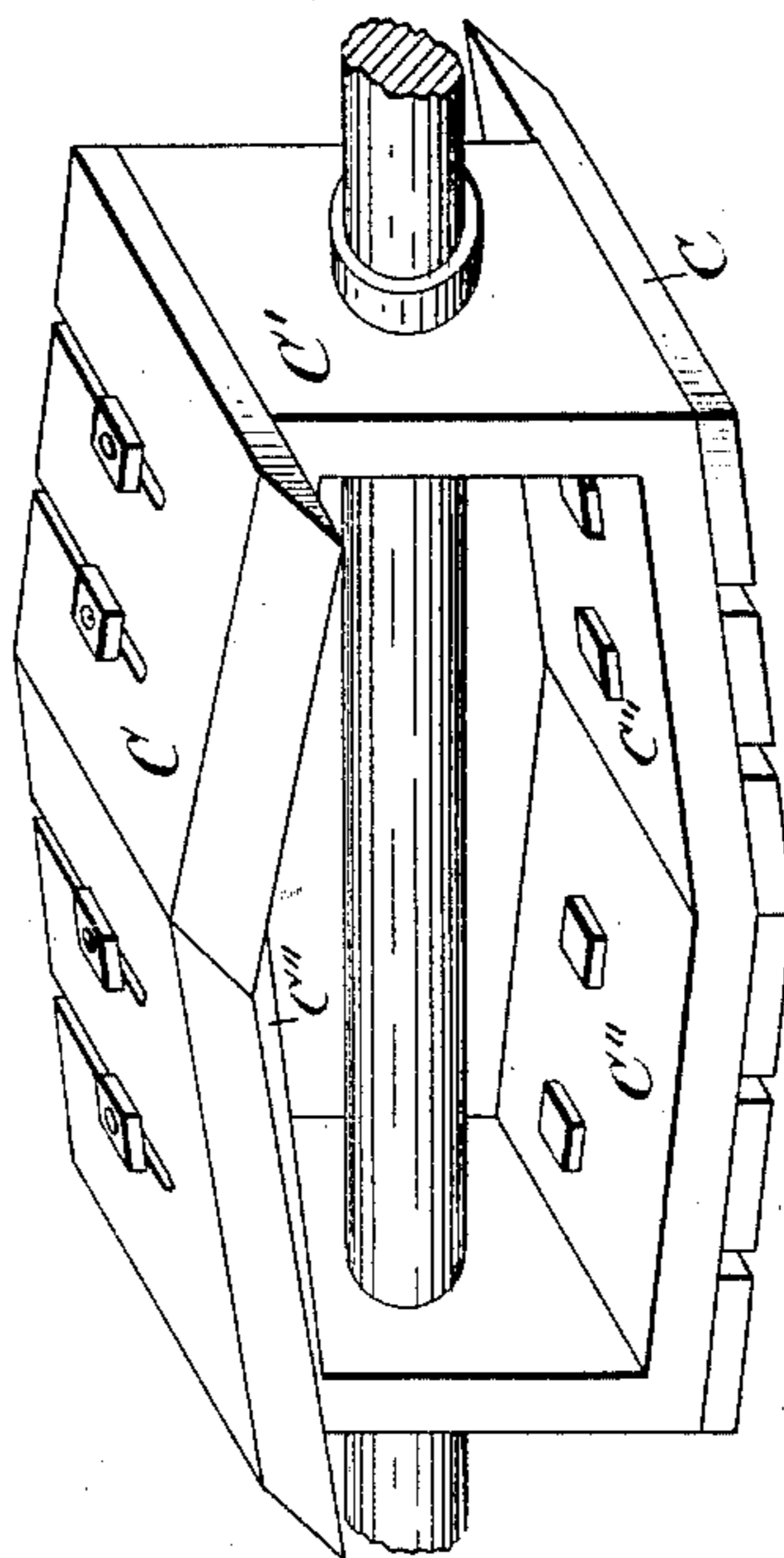


Fig. 6.

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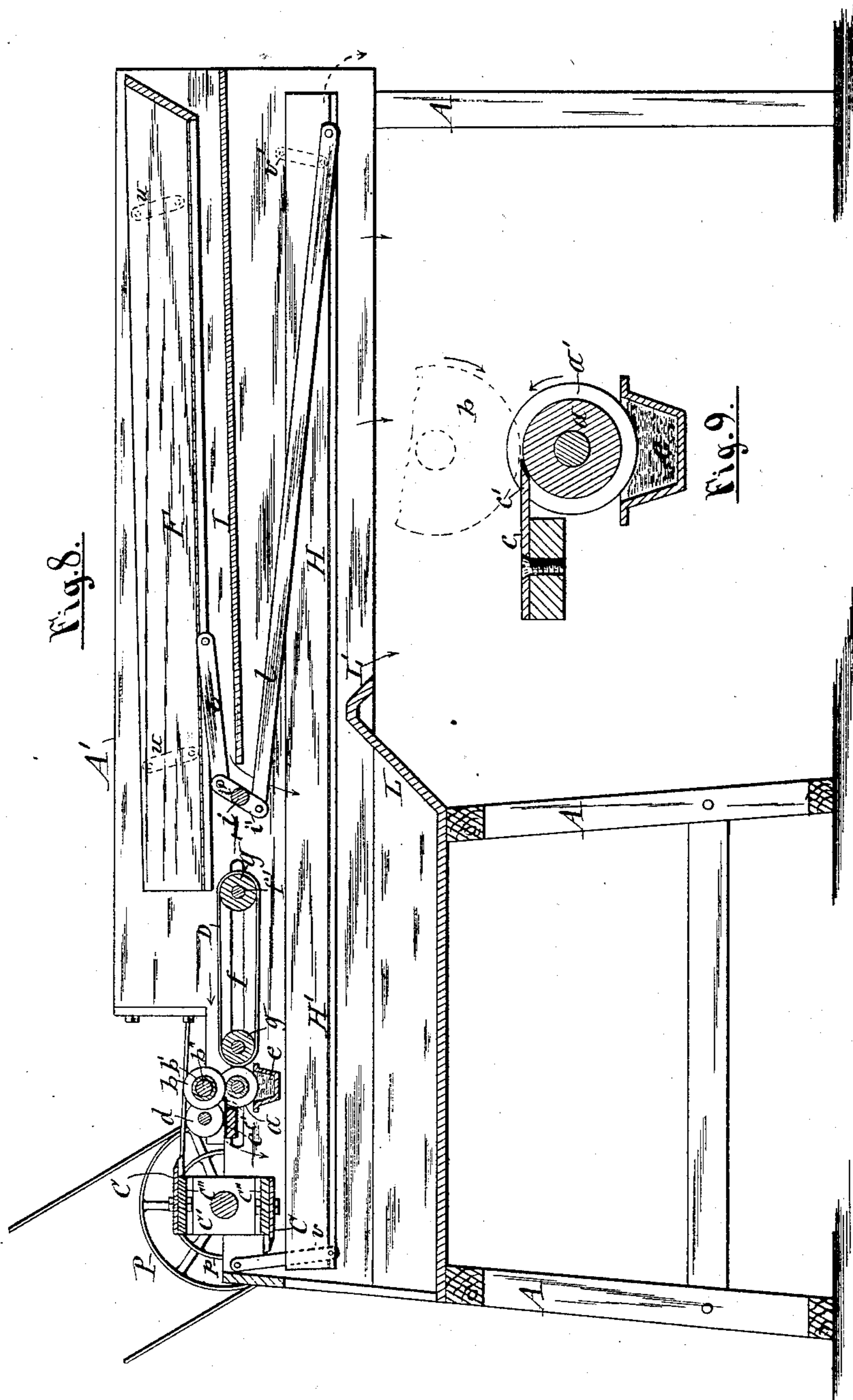
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UNITED STATES PATENT OFFICE.

GEORGE LE CLAIR, OF MEXICO, NEW YORK, ASSIGNOR OF ONE-HALF TO
C. CORTLAND BROWN, OF SAME PLACE.

TOBACCO-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 370,953, dated October 4, 1887.

Application filed May 18, 1887. Serial No. 238,587. (No model.)

To all whom it may concern:

Be it known that I, GEORGE LE CLAIR, of Mexico, in the county of Oswego, in the State of New York, have invented new and useful Improvements in Tobacco-Cutting Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of machines which cut leaf-tobacco into scraps designed for fillings of cigars; and the invention has special reference to the machine for which I have obtained Letters Patent of the United States, No. 348,402, dated August 31, 1886.

My present invention consists in an improved construction and combination of the essential parts of the machine, whereby the efficiency thereof is materially increased.

The invention is fully illustrated in the annexed drawings, wherein Figures 1 and 2 are elevations of opposite sides of a machine embodying my improvements. Fig. 3 is an enlarged detail view of the knives employed for longitudinally slitting the tobacco. Fig. 4 is an enlarged detached perspective view of the aforesaid knives and the rollers which co-operate therewith, viewed from the side presented in Fig. 1. Fig. 5 is a top plan view of the machine, portions of the upper sieve and subjacent shelf being broken away to show the arrangement of the lower sieve. Fig. 6 is an enlarged detached perspective view of the rotary cutter-head carrying the transverse cutters. Fig. 7 is a detached plan view of said cutters. Fig. 8 is a vertical longitudinal section of the machine. Fig. 9 is a detached enlarged transverse section of the feed-roller, water-trough, and devices for preventing the gumming of the said roller; and Fig. 10 is an enlarged detached plan view of the crank-shaft which imparts oscillatory motion to the sieves.

Similar letters of reference indicate corresponding parts.

A represents the main supporting-frame of the machine, which is constructed with a longitudinally elongated feed-hopper, A'. In the said hopper, near the forward end thereof, is an endless feed-belt, D, running on rollers *g g'*, extended across the hopper. The roller *g* is journaled in suitable boxes secured to the

sides of the hopper, and has gears *m, m'*, and *m''* attached to its ends, for the purpose hereinafter explained. The other roller, *g'*, is mounted loosely on a shaft, *f'*, the ends of which project through longitudinal slots *f f'* in the sides of the frame A, and to the protruding ends of said shaft are connected hooks *h h*, having screw-threaded shanks which pass through the posts of the frame, and are provided with nuts *n* on their ends. By turning said nuts, so as to cause the hooks to be drawn toward the posts, the roller *g'* is drawn in the same direction, and thus the feed-belt D is tightened. Along the discharge portion of the said feed-belt, or in front of and parallel with the roller *g*, is a feed-roller, *a*, journaled in the sides of the frame, and provided at one end with a pinion, *j*, by which it receives motion, as hereinafter described. The said feed-roller is provided with circumferential grooves *a' a' a'*, as shown in Figs. 4 and 9 of the drawings, and over this roller and parallel therewith is a mandrel, *b''*, also journaled in the sides of the frame, and has affixed to one and the same end two pinions, K and K', the pinion K' meshing in the gear *m'*, and the pinion K, engaging the pinion *j*, hereinbefore referred to, as best seen in Fig. 2 of the drawings.

On the mandrel *b''* are rigidly mounted a series of circular knives, *b*, which stand in planes parallel with the line of feed, and are maintained the desired distance apart by means of collars *b' b'*, mounted on the mandrel between the knives, as shown in Fig. 3 of the drawings. The knives *b b* run in the grooves *a' a'* of the feed-roller *a*, as illustrated in Figs. 8 and 9 of the drawings. At the front or discharge side of the feed-roller *a* and parallel therewith is a plate, C, extended across the frame and rigidly secured thereto. This plate is provided with fingers *c' c'*, which project into the grooves *a' a'* of the feed-roller and serve to scrape and clean the said grooves during the rotation of the roller. Over the plate *c* is another roller, *d*, parallel with the mandrel *b''*, and journaled in boxes in the sides of the frame A. This roller is likewise provided with circumferential grooves *d' d'*, in which the knives *b b* run, as shown in Figs.

4, 5, and 8 of the drawings. It receives rotary motion by means of a pinion, *o*, secured to one end of its shaft and meshing in the gear *m'*, hereinbefore mentioned. Said roller, rotating in the direction indicated by arrows in the drawings, serves to draw the slitted tobacco-leaves from between the knives *b b* and underlying feed-roller *a*. Under this feed-roller is supported a water-trough, *e*, in which the lower portion of said feed-roller runs, so as to immerse said portion thereof in the water and cause the roller when in motion to carry sufficient moisture to the knives *b b* and to the tobacco in process of being cut to prevent the knives from gumming. Across the discharge-edge of the plate *c* are arranged to move the transverse cutters *C C*, which cut the longitudinally-slitted leaves into short and nearly square pieces.

In order to obviate the jarring of the machine incident to the abrupt transverse cuts of the aforesaid cutters, as heretofore constructed, I now form the cutter-head *C'* with longitudinal plates *C'' C''*, which are inclined toward the axis of the cutter-head from the center toward opposite ends thereof, and secure to said plates the cutters *C C*, which are thus pitched or inclined in the manner aforesaid. The cutting-edges of these cutters I form flaring or divergent from the center toward opposite ends of the cutter-head and at such angles as to reduce the tangential projection of the knives at the center of the cutter-head sufficient to compensate for the increased radial distance of the knives from the axis of the cutter-head at said point, and thus bring the cutting-edges equidistant from the axis of the cutter-head and cause them to register with the straight discharge-edge of the plate *c* when the cutter-head is in motion.

By the described form and position of the cutters *C C*, I produce a shearing cut on the tobacco, and thus obviate the jarring of the machine and render the same more durable and efficient. Said shearing cut being from the ends of the knives toward the center thereof, tends to crowd the tobacco in the direction aforesaid and insures the cutting of the tobacco.

To the shaft of the cutter-head *C'* are attached the driving-pulley *P* and pulleys *p p'*. The pulley *p'* is connected by a driving-belt, *q'*, with a pulley, *T'*, which is journaled on a gudgeon rigidly secured to the outside of the frame *A*, as shown in Fig. 5 of the drawings, and to the shaft of the pulley *T'* is firmly secured a pinion, *t*, which meshes in the gear-wheel *m*. Across the frame *A*, back of the feed-belt *D*, is extended a crank-shaft, *i*, having crank-arms *i' i'* projecting in opposite directions, as shown in Fig. 10 of the drawings. Said crank-shaft receives rotary motion by means of a pulley, *T*, secured to the end thereof, and connected by a driving-belt, *q*, with the pulley *p* on the shaft of the cutter-head *C*.

F represents a longitudinally-oscillatory

sieve suspended from the upper part of the sides of the feed-hopper *A'* by hangers *u u*, and inclined toward the feed-belt *D*, and terminating over the same to deliver thereto the tobacco-leaves placed on said sieve. The sieve *F* is sufficiently coarse to allow nails and other foreign hard substances to fall out of the tobacco and through the sieve, and thus obviate the danger of breaking the knives incident to the encounter of the same with said hard substances.

H denotes another longitudinally-oscillatory sieve arranged under the sieve *F* and of the same grade. This lower sieve has a forward extension, *H'*, which is finer and reaches under the feed-belt *D* and the hereinbefore-described feed-rollers and cutters, as illustrated in Fig. 8 of the drawings. Between the coarse sieves *F H* is arranged a shelf, *I*, which is inclined toward the fine sieve *H'*, and terminates over the same. Under the sieve *H*, at or near its junction with the extension *H'*, are chutes *L* and *L'*, which diverge so as to convey the screenings from the two sieves *H* and *H'* in opposite directions. The sieve *H*, with its extension *H'*, is suspended by long hangers *v v* at the forward end and by shorter hangers *v' v'* at the rear end, and these are inclined with their lower ends toward each other, as shown, thereby crossing said sieve to receive a rearward thrust, which conveys out through the rear end of the sieve, as indicated by the dotted arrow in Fig. 8 of the drawings, such of the substances as are unable to pass through the interstices of the sieve.

In the operation of the machine the cutter-head *C* receives rotary motion from the driving-pulley *P*, mounted on the shaft of said cutter-head, and from this shaft motion is transmitted to the crank-shaft *i* by means of the pulleys *p* and *T* and their driving-belt *q*, said crank-shaft imparting reciprocating motion to the sieves, which motion is rendered oscillatory by the hangers *u u* and *v v'*. The tobacco-leaves, being placed lengthwise on the upper sieve, *F*, are thereby shaken to eliminate therefrom nails which are occasionally dropped among the tobacco in the process of packing the same in boxes. The nails and analogous foreign substance drop through the said sieve, while the clean tobacco is moved toward the feed-belt *D* by the motion of the sieve. The feed-belt, which carries the tobacco to the slitting-knives *b b*, receives motion from the shaft of the cutter-head *C'* by means of the pulleys *p'* and *T'* and their driving-belt *q'*, pinion *t*, and gear *m*. The knives *b b*, which slit the tobacco longitudinally, receive rotary motion from the pinion *m'* by the pinion *K'* meshing in the pinion *m'*, as hereinbefore described. The subjacent feed-roller *a*, upon which the tobacco is slitted, receives rotary motion from the arbor of the knives *b b* by the pinion *K* on said arbor meshing in the pinion *j* on the end of the feed-roller, as best seen in Fig. 2 of the drawings. The other roller, *d*, receives motion from the gear *m''* on the feed-belt-carry-

ing roller *g* by means of the pinion *o* on the shaft of the roller *d* meshing in the gear *m''*, as shown in Fig. 1 of the drawings. The directions of the aforesaid motions are indicated by arrows in Figs. 1, 2, 4, and 9 of the drawings. The cut tobacco falls from the discharge edge of the plate *c* down onto the lower and finer sieve, *H'*, which eliminates from the tobacco the dust accompanying the same and that which is delivered to said sieve by the shelf *I*. The tobacco cuttings or scraps are shaken toward and over the sieve *H*, which allows the said scraps to fall through it, as indicated by arrows in Fig. 8 of the drawings. Such portions of tobacco which may have escaped being cut to the desired size and are too long to pass through the sieve *H* are shaken out through the rear end of said sieve, as indicated by the dotted arrow in the aforesaid figure.

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

1. In combination with the feed-hopper and conveyer, the feed-roller *a*, provided with circumferential grooves *a' a'*, the rotary circular knives *b b* over the feed-roller and entering the grooves thereof, the plate *c*, and the roller *d* over the said plate and provided with grooves coinciding with the aforesaid knives, as set forth and shown.

2. In combination with the feed-hopper and conveyer, the feed-roller *a*, provided with the grooves *a' a'*, the rotary circular knives *b b* over the feed-roller and entering the grooves thereof, the plate *c*, having fingers *c'* projecting into the grooves of said feed-roller, the roller *d* over the said plate, and the rotary cutter *C*, arranged to move across the discharge-edge of the plate *c*, substantially as described and shown.

3. The cutter-head *C'*, formed with the longitudinal plates *C'' C''*, inclined toward the axis of the cutter-head from the center toward opposite ends thereof, in combination with the cutters *C C*, secured to the inclined sides of said plates and having their cutting-edges diverging from the center toward opposite ends of the cutter-head, substantially as described and shown.

4. The combination of the plate *c*, having a

straight discharging-edge, and the cutter-head *C'*, arranged axially parallel with said edge, and having the cutters *C C* with cutting-edges extending in the direction of the length of the axis of the cutter-head and inclining toward said axis from the center toward opposite ends of the cutter-head and diverging in said direction, substantially as described and shown.

5. A tobacco-cutting machine comprising an endless feed-belt, a feed-roller arranged along the discharge portion of said belt, rotary circular knives over said feed-roller and in planes parallel with the line of feed, a water-trough under the feed-roller, a stationary plate along the discharge side of the feed-roller and having a straight discharge edge, a roller over said plate, and a cutter-head arranged axially parallel with the discharge edge of the aforesaid plate and having cutters with cutting-edges extending in the direction of the length of the axis of the cutter-head and inclining toward said axis from the center toward opposite ends of the cutter-head and diverging in said direction, substantially as described and shown.

6. In combination with the cutter and feed-conveyer, the longitudinally-oscillatory sieve *F*, inclined toward said conveyer and having its delivery end over the same, the longitudinally-oscillatory sieve *H*, suspended under the sieve *H* by the long hanger *v* and short hanger *v'*, inclined with their lower ends toward each other, and carrying the finer sieve-extension *H'* under the cutters, the crank-shaft *i*, having the cranks projecting in opposite directions, pitmen *l l*, connecting said cranks with the sieves, the shelf *I* between the upper sieve and coarse section of the lower sieve and having its delivering end over the finer sieve-section *H'*, and the divergent chutes *L L'*, under the lower sieve at the junction of the coarse and finer sections thereof, substantially as described and shown.

In testimony whereof I have hereunto signed my name and affixed my seal, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 3d day of May, 1887.

GEORGE LE CLAIR. [L. s.]

Witnesses:

H. P. DENISON,
C. C. BROWN.