

(No Model.)

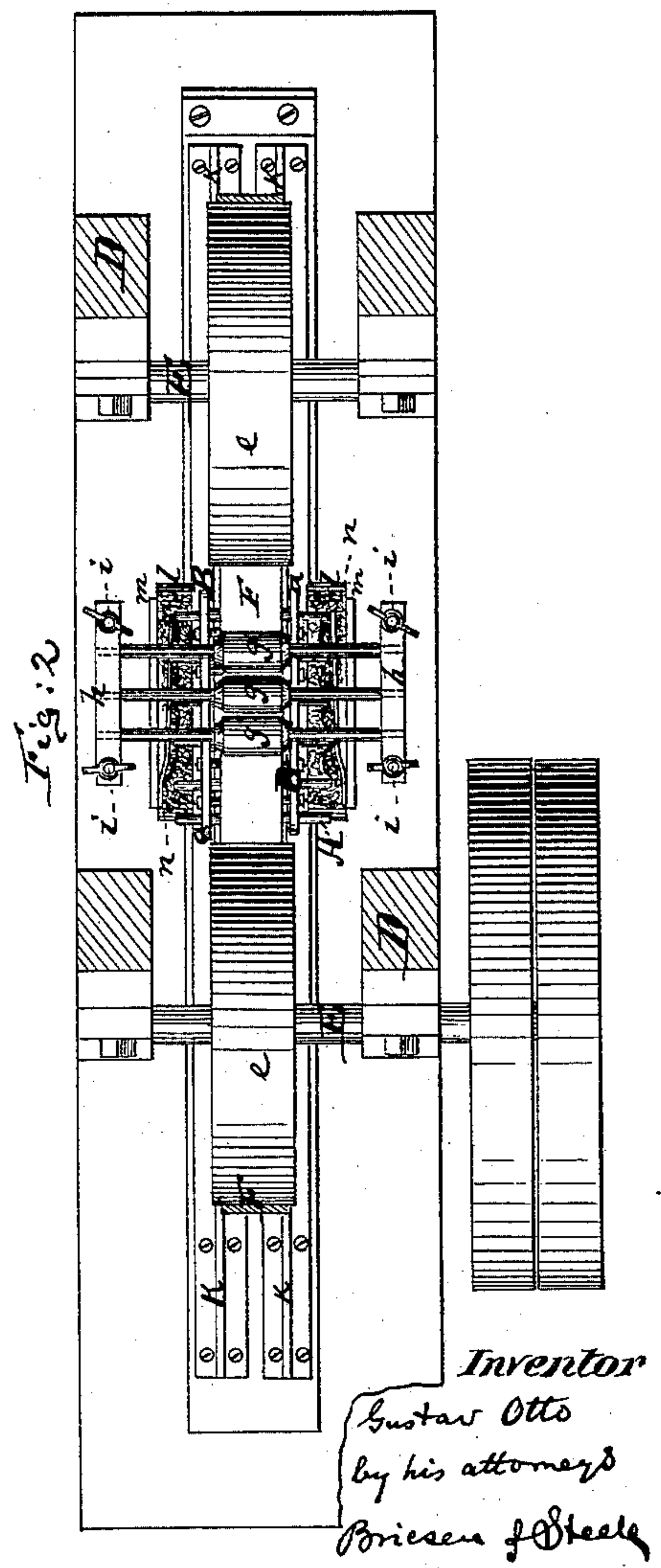
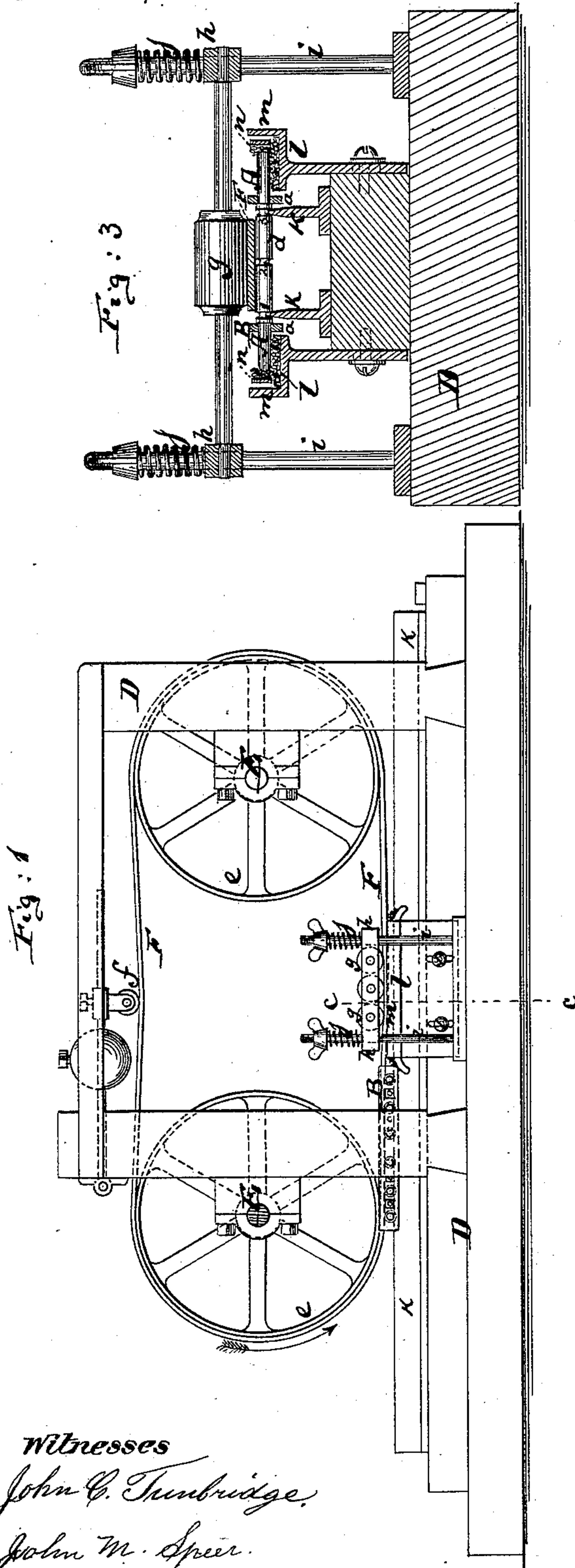
4 Sheets—Sheet 1.

G. OTTO.

CAPSULE MACHINE.

No. 299,936.

Patented June 3, 1884.



(No Model.)

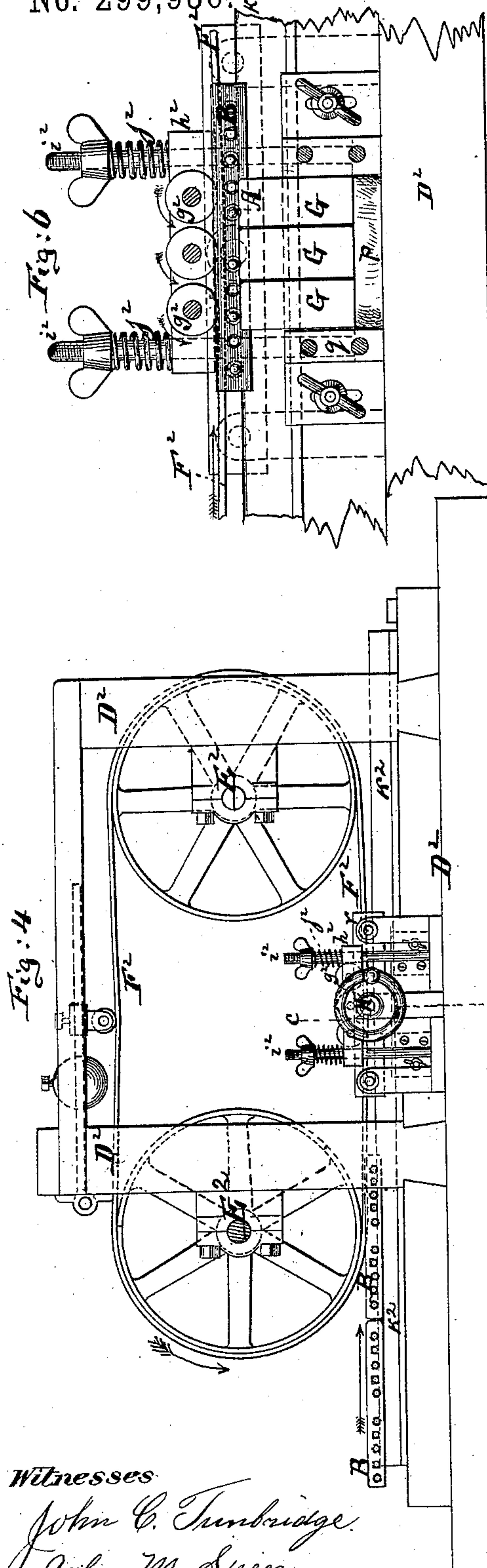
4 Sheets—Sheet 2.

G. OTTO.

CAPSULE MACHINE.

Patented June 3, 1884.

No. 299,936.



Witnesses
John C. Turnbridge
John M. Speer.

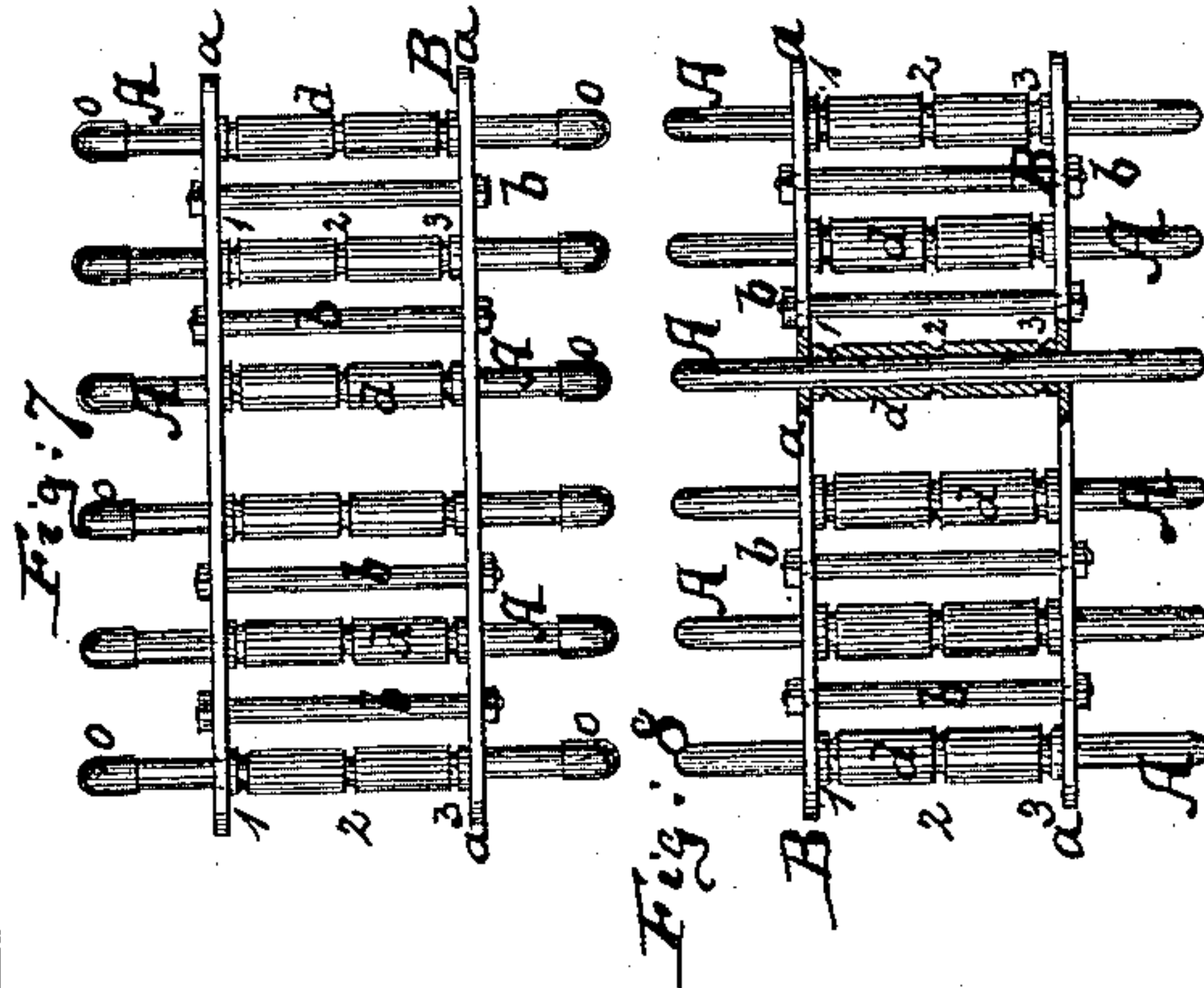
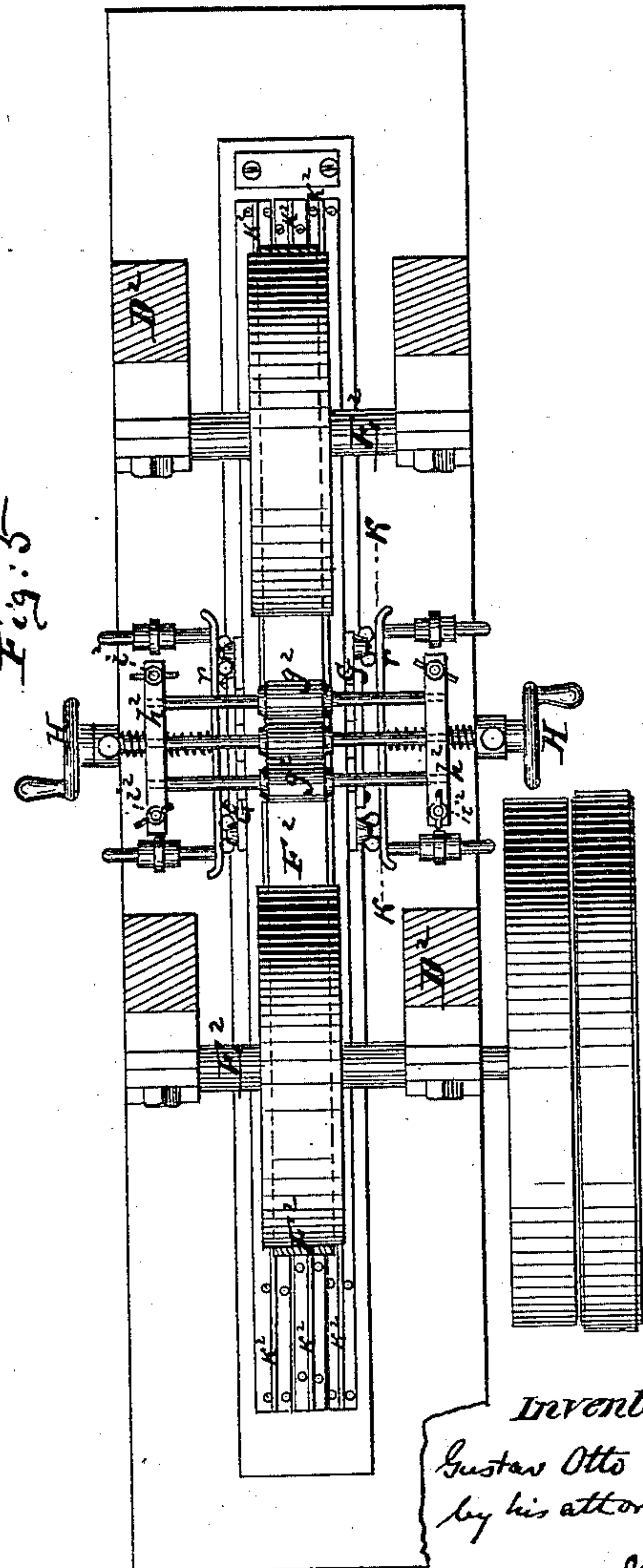


Fig. 5



Inventor
Gustav Otto
by his attorney
Boniesen & Steef

(No Model.)

4 Sheets—Sheet 3.

G. OTTO.
CAPSULE MACHINE.

No. 299,936.

Patented June 3, 1884.

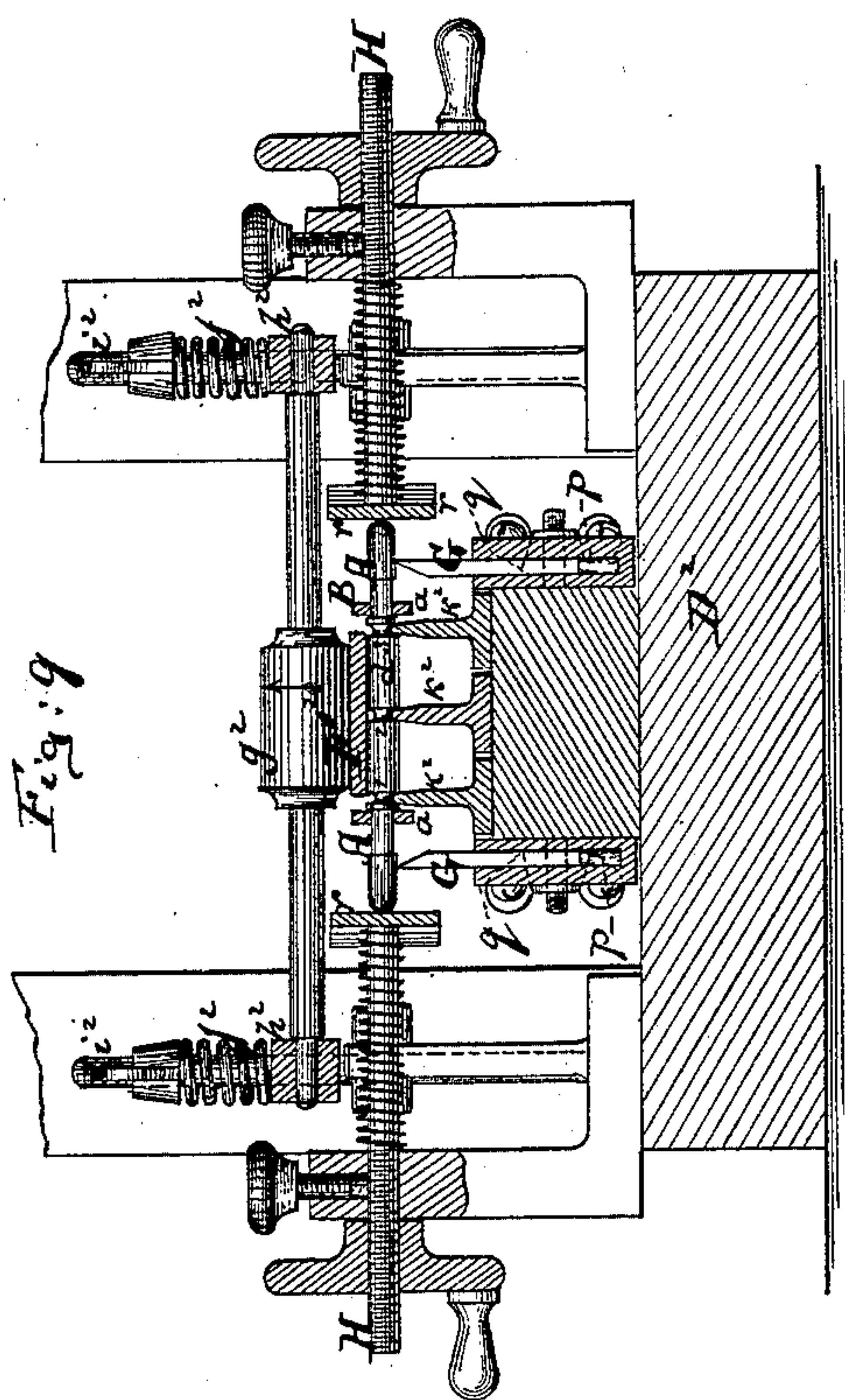
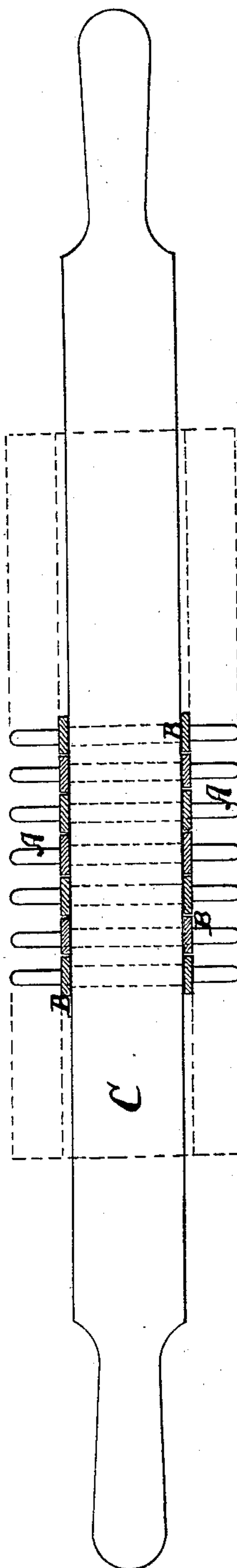


Fig. 10



Witnesses

John C. Tunbridge
John M. Spear

Inventor

Gustav Otto
by his attorneys
Briesen & Steele

(No Model.)

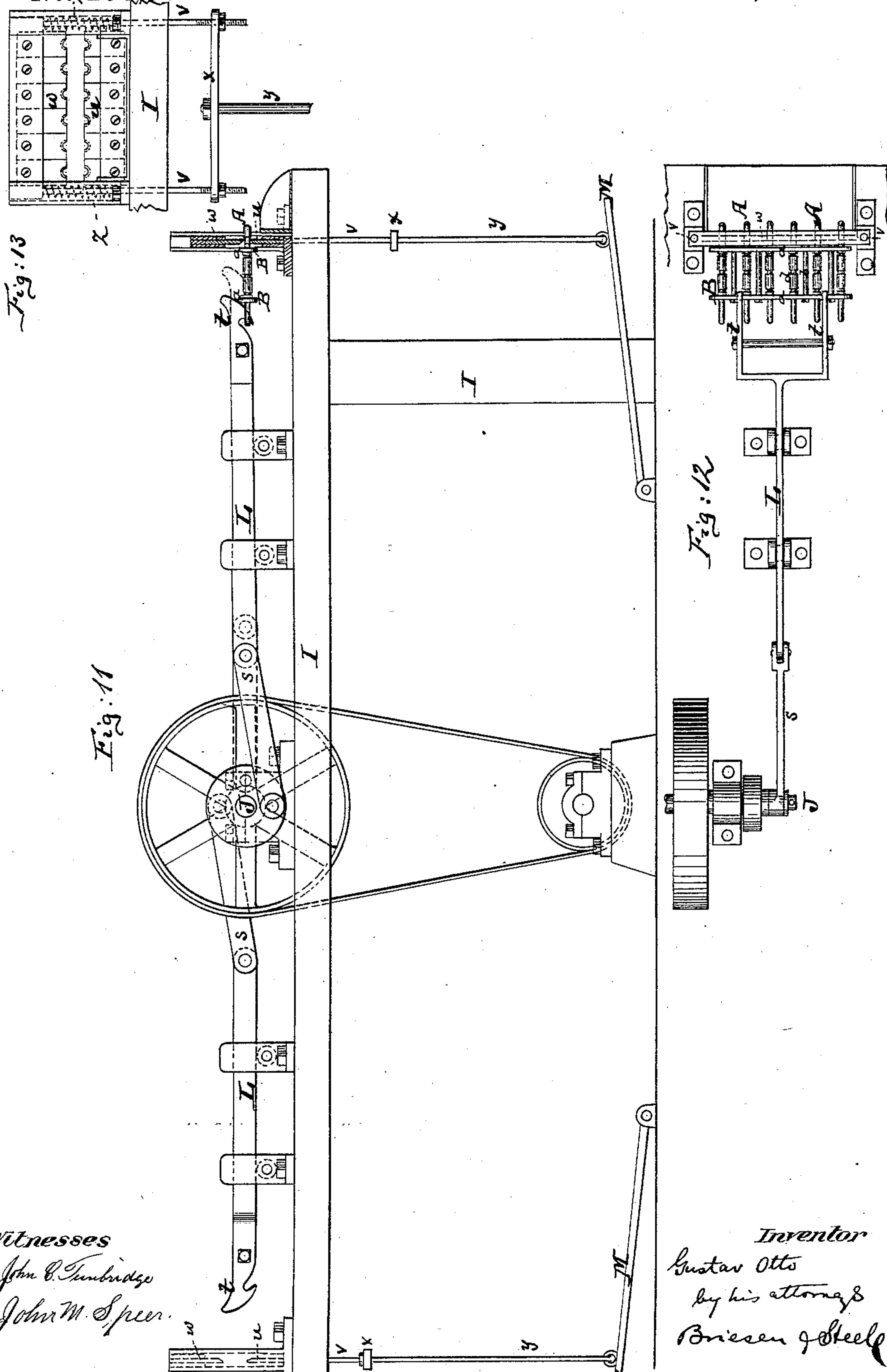
4 Sheets—Sheet 4.

G. OTTO.

CAPSULE MACHINE.

Patented June 3, 1884.

No. 299,936.



Witnesses

John C. Timbridge
John M. Speer.

Inventor

Gustav Otto
by his attorneys
Brienen & Steels

UNITED STATES PATENT OFFICE.

GUSTAV OTTO, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO ROBERT H. McCUTCHEON, OF NEW YORK, N. Y.

CAPSULE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 299,936, dated June 3, 1884.

Application filed March 13, 1884. (No model.)

To all whom it may concern.

Be it known that I, GUSTAV OTTO, a resident of Jersey City, in the county of Hudson and State of New Jersey, have invented an Improved Machine for Making Capsules, of which the following is a full, clear, and exact description, reference being made to the accompanying drawings.

This invention has for its object to produce mechanism on which gelatine capsules can be rapidly and economically manufactured. The mechanism in question comprises the whole manufacture of the capsule, from the dipping of the mold pins or spindles into the liquid gelatine to the production of the complete capsule detached from the spindle.

The invention comprises means for oiling the spindles, so that the gelatine will not adhere to them too closely, means for holding and revolving the capsules, means for cutting them to proper lengths, and, finally, means for detaching them from the spindles. Although in the accompanying drawings these several means are shown as detached devices, yet in the manufacture of capsules they constitute practically one machine.

In the drawings, Figure 1 represents a side elevation of the mechanism employed for oiling the spindles. Fig. 2 is a top view of the same. Fig. 3 is a vertical cross-section, on an enlarged scale, taken on the plane of the line *c c*, Fig. 1. Fig. 4 is a side elevation of the mechanism for cutting the capsules; Fig. 5, a top view of the same; Fig. 6, a vertical longitudinal section, on an enlarged scale, taken on the plane of the line *k k*, Fig. 5. Fig. 7 is a top view of the spindle-frame employed in this apparatus, showing it with the capsules on the ends of the spindles. Fig. 8 is a similar view of said spindle-frame without the capsules. Fig. 9 is a vertical cross-section, on an enlarged scale, taken on the plane of the line *c k*, Fig. 4. Fig. 10 is a sectional view of a series of spindle-frames, showing them strung on a rod for dipping. Fig. 11 is a side view, partly in section, of the capsule-stripping mechanism; Fig. 12, a top view of the same; Fig. 13, a front elevation of the same.

I will first describe the spindle-carrying frames B, which are shown more clearly in

Figs. 7 and 8. Each of these consists of two parallel bars, *a a*, which are or may be held the proper distance apart by braces *b b*, and which serve as bearings for the swiveled spindles A A. These spindles are rods of steel with rounded ends, as appears more clearly from Fig. 8, both ends of each spindle projecting from the carrying-frame B, so that both may be utilized for dipping purposes. Between the bars *a a* each spindle is surrounded with a pulley-like enlargement, *d*, which is fixed to it, so that by its means the spindle may be revolved. These enlargements *d* have, by preference, circumferential grooves, which are marked 1 2 3 in Figs. 7 and 8, for the purpose of guidance on the oiling and cutting frames, as hereinafter more fully stated. It will be seen that these little frames B B, having the swiveled spindles A A, are very easily handled. They may be strung upon a stick, C, as in Fig. 10, for dipping purposes, may be easily suspended from suitable hooks or devices for drying purposes, and, because of the peculiar construction of the swiveled spindles A with the enlargements *d*, the said frames are readily ranged for continuous operation of the oiling and cutting devices.

Before the ends of the spindles A A can be dipped in the gelatine-mixture they should be oiled, in order to prevent too close adhesion of the gelatine to the bodies of the spindles. For this purpose the oiling mechanism shown in Figs. 1, 2, and 3 has been devised. This mechanism consists of a frame, D, carrying the parallel shafts E E, which in turn carry pulleys *e*, around which is placed the endless belt F. The said belt is held taut by a suitable friction-roller, *f*, or otherwise, and passes beneath series of little rollers *g*, that are hung in a frame, *h*, which is capable of vertical adjustment on posts *i*, and pressed downward on said posts by springs *j*. Fig. 3 shows clearly the belt F beneath one of these rollers *g*, and the springs *j* above the frame *h*.

Directly below the place where the rollers are thus ranged the frame D carries a pair of parallel rails, *k*, and also parallel thereto a pair of platforms, *l*, that have on their outer sides vertical flanges *m*, as shown in Fig. 3. To the inner sides of these flanges *m* are fast-

ened springs n , which are shown in Fig. 3, and also clearly indicated in Fig. 2.

The spindle-frames B B are introduced in this machine by an attendant, who places them on the rails $k k$ and pushes them under the belt F, whereupon the belt, which is revolved in the direction of the arrow, which is shown in Fig. 1, carries said frames along beneath the rollers g , thereby exposing the ends of the spindles A to contact with oiled cotton or the like, which is on the platforms l , and which, moreover, is or may be pressed against the ends of said spindles by the springs n . The frames B B are guided in their longitudinal motion by means of the rails entering grooves 1 and 3, as is more clearly shown in Fig. 3; but instead of said grooves being in the enlargements d of the spindles there may be analogous projections bearing against the sides of the rails. The springs j can be compressed by thumb-nuts above them, so that the pressure of the belt upon the traveling frames B B may be regulated. The attendant pushes one frame B after the other into this machine, and so soon as it issues from the machine the ends of all the spindles A A will have been properly oiled. It will be seen that the spindles A A while passing over the rails k are revolved, thus exposing them properly to contact with the oiled cotton or the like, and preventing any part of the mold portion of each spindle remaining dry. The spindles having been properly oiled, the frames B may then be strung upon the rod C in the manner shown in Fig. 10. The ends of the spindles are then dipped into the gelatine, and the frames are then hung up to let the gelatine dry. The frames now appear in the condition shown in Fig. 7—that is, with the gelatine-cups o covering the ends of the spindles A. They are now ready for the cutting mechanism, which is shown in Figs. 4, 5, 6, and 9, and which has in a frame, D², bearings for shafts E² E², over which is placed an endless belt, F², the frame also carrying suitable rails, k^2 , for guiding the frames B under the belt. The belt F² also passes beneath a frame, h^2 , having rollers g^2 , that are in every respect like the rollers g and their supports in the oiling apparatus—that is to say, the frames h^2 slide on posts i^2 , and are under pressure of springs j^2 , so that the belt F², revolving in the direction of the curved arrow, which is shown in Fig. 4, will carry along the frames B B, which are placed on the rails k^2 , and will cause the spindles A A of said frames to revolve by their contact with the rails and belt.

The frame D² carries beneath the rollers g^2 the knives G G. (See Figs. 6 and 9.) These are vertical blades that are placed beneath the ends of the spindles at the proper distances apart, and whose lower ends rest on rubber cushions p , or analogous elastic supports. I prefer to have three blades G G on each side, as indicated in Fig. 6, so that the cutter on each side will practically be sectional, and will yield to whatever undulating motion

through the inequalities of machinery and the setting of spindles may be necessary for the purpose of performing a proper cutting operation. The lower parts of the blades G are set in pockets q , which are indicated in Fig. 9, and which may be vertically adjustable on the frame D². While the spindles A are above these cutters their ends are between vertical cheek-pieces $r r$, which are attached to screw-spindles H, as shown in Fig. 9, and which prevent the frames B from jumping the tracks while the knives are operating.

As the frames B, with the spindles A, that carry the capsules o at their ends, are passed beneath the belt F² over the rails k^2 , the capsules will be brought in contact with the knives G G, and will be cut at the places where these knives are located to their proper lengths, the spindles revolving by contact with the belt and rails, or either, while they pass over the knives.

The incisions for giving the capsules the proper length having thus been produced, it only remains to detach them from the spindles. To this end the apparatus shown in Figs. 11, 12, and 13 is employed. The same consists of a frame, I, carrying a crank-shaft, J, to which a rotary motion is imparted by suitable means, and which shaft connects by links s with reciprocating sliding rods L, that carry hooks t at their free ends, said hooks being forked, as appears more clearly from Fig. 12. The same shaft J may move one or more rods L and hooks t . On the frame I is also supported, for every set of hooks t , an upright ledge, u , which has its upper edge notched, as appears more clearly from Fig. 13, each notch corresponding, as to depth and distance from the others, to the position of one of the spindles A in the frame B. Above this ledge u is supported on posts v a sliding plate, w , having in its lower edge notches to correspond with those of the ledge u . The posts v are united to a cross-piece, x , which connects by a rod, y , with a treadle, M. Normally the plate w is raised off the ledge u by springs z or weights, as in Fig. 13. In this position of parts a frame, B, having the cut capsules on its ends, is inserted between the plates u and w , so that they engage the spindles A A in said frame directly back of the capsules thereon. At the same time the rod a of said frame B which is nearest the hooks t is placed under said hooks while they are nearest the plate w , as indicated by dotted lines in Fig. 11. The treadle M is now depressed, so as to bring the plate w down upon the spindles A A back of the capsules, and the shaft J revolving, the hooks t draw the frame B toward the shaft J, allowing the plates u and w , by their close contact with the spindles A, to strip the capsules off the spindles at the ends of the latter, which were gripped between the plates u and w . The treadle M is now let go, the frame B reversed, so as to get the other ends of the spindles A between said gripping-plates, and the operation performed as before.

The action of the machine is practically instantaneous, and the capsules will all be stripped off the frame without any danger of breaking or spoiling them.

5 I claim—

1. In a capsule-machine, the spindle-carrying frame B, having parallel rods *a a*, combined with the swiveled spindles A A, that are hung in said rods, substantially as described.

10 2. In a capsule-machine, the spindle-carrying frame B, having parallel rods *a a*, combined with the swiveled spindles A A, that are hung in said rods, and that are provided with the pulley enlargements *d*, substantially as described.

15 3. In a capsule-machine, the spindle-carrying frame B, having parallel rods *a a*, combined with the swiveled spindles A A, that are hung in said rods, and that are provided with the pulley enlargements *d*, having circumferential grooves for guiding purposes, as specified.

20 4. The combination of the endless belt F with the platforms *l*, guide-rails *k*, and pressure-rollers *g*, substantially as and for the purpose described.

25 5. The combination of the endless belt F with the rollers *g*, springs *j*, platforms *l*, springs *n*, and rail or rails *k*, all arranged substantially as described, for oiling the ends of spindles A A, that are swiveled in frames B, substantially as described.

6. The combination of the belt F² and rail or rails *k*² with the cushioned knives G G, for use on frames B, having swiveled spindles A, 35 substantially as described.

7. The combination of the belt F² and rail or rails *k*² with the adjustable cheek-pieces *r r* and with the cushioned knives G G, substantially as described. 40

8. In a capsule-cutting machine, the knives G G, made sectional, substantially as herein shown and described.

9. The combination of the belt F² with the rollers *g*², adjustable roller-frame *h*², rail or rails *k*², sectional cushioned knives G G, and adjustable cheek-pieces *r*, for use on frames B, carrying swiveled spindles A A, substantially as and for the purpose herein shown and described. 45

10. The combination of the hook *t*, and means, substantially as described, for reciprocating it, with the gripping-plates *u* and *w*, and means, substantially as described, for bringing them together, and with the frame 55 B, having the spindles A A, substantially as specified.

GUSTAV OTTO.

Witnesses:

C. G. M. THOMAS,
GUSTAV SCHNEPPÉ.