

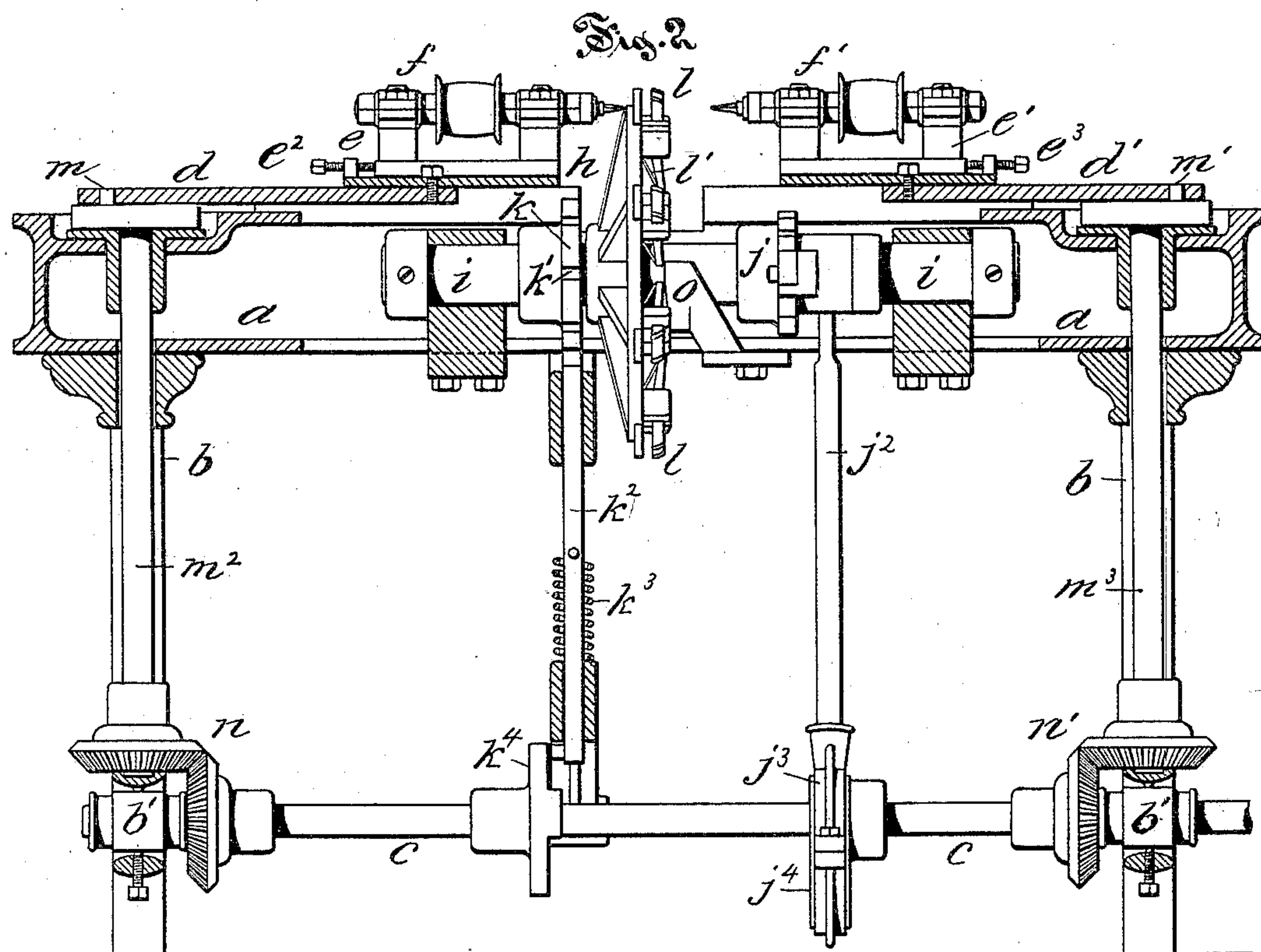
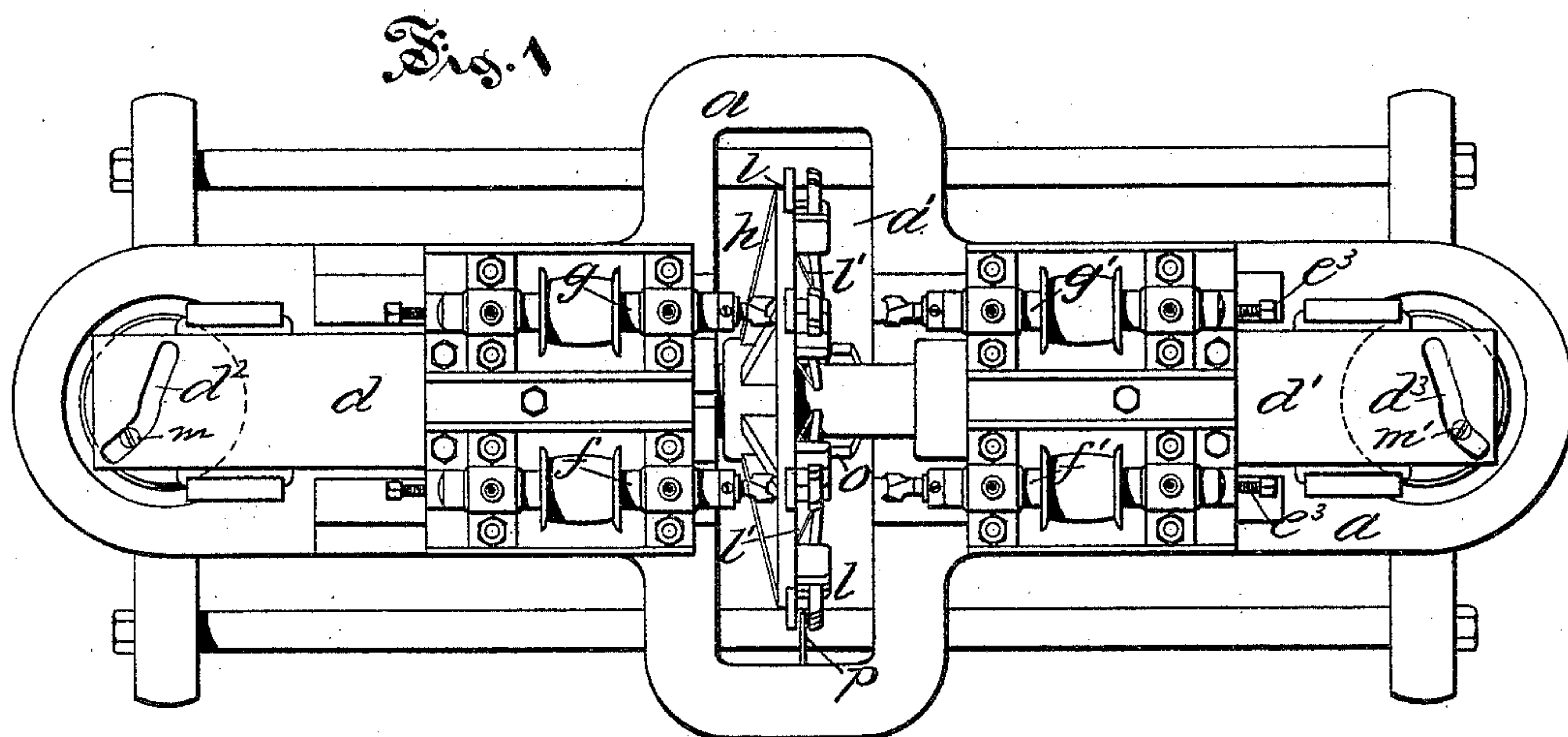
(No Model.)

2 Sheets—Sheet 1.

P. A. OTIS.
BUTTON MAKING MACHINE.

No. 409,225.

Patented Aug. 20, 1889.



Witnesses:

Wm. Yorkman.
H. R. Williams.

Inventor:

Philip A. Otis
by Simondo & Burdett,
attys

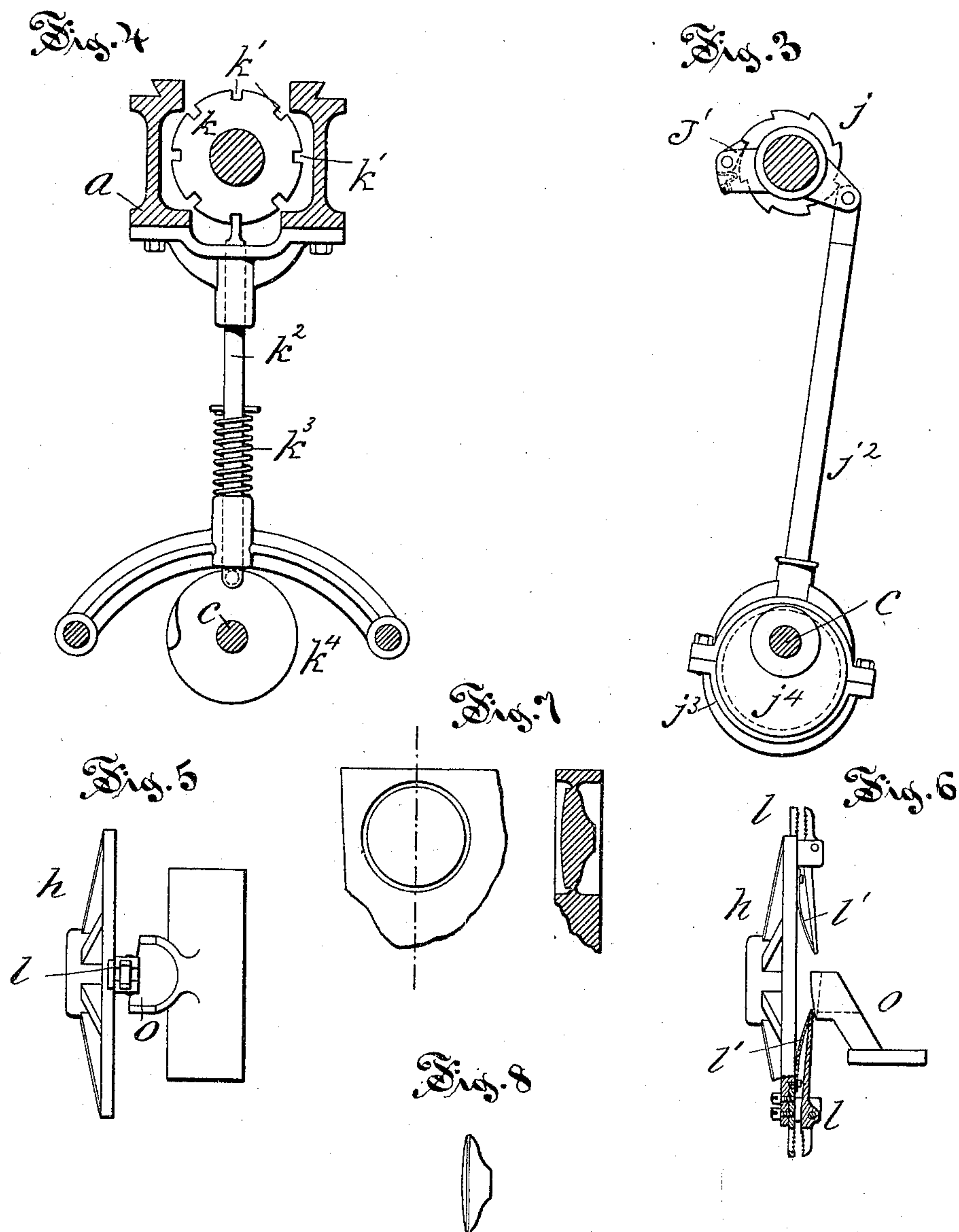
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2 Sheets—Sheet 2.

P. A. OTIS.
BUTTON MAKING MACHINE.

No. 409,225.

Patented Aug. 20, 1889.



Witnesses:

W. M. Dyckman,
H. R. Williams.

Inventor:

Philip A. Otis
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UNITED STATES PATENT OFFICE.

PHILIP A. OTIS, OF LEEDS, MASSACHUSETTS.

BUTTON-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 409,225, dated August 20, 1889.

Application filed March 17, 1887. Serial No. 231,343. (No model.)

To all whom it may concern:

Be it known that I, PHILIP A. OTIS, of Leeds, in the county of Hampshire and State of Massachusetts, have invented certain new and useful Improvements in Button-Making Machines, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

The object of my invention is to provide a machine for cutting and forming buttons out of pieces of vegetable ivory, the machine being provided with a set of roughing-cutters and a set of finishing-cutters, so that the result of the operation of the machine is a button of better finish, with less wear of tools, than has been obtained in prior machines in the art.

My invention consists in the combination of the revolving head with the blank-holding jaws and the reciprocating cutter-carriages, bearing, respectively, the roughing and finishing cutters.

It further consists in the combination of the reciprocating head, the blank-holding jaws, and the jaw-opening device; and it further consists in details of the machine and its several parts, and in their combination, as more particularly hereinafter described, and pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a top view of a machine constructed in accordance with my improvements. Fig. 2 is a view of the machine in vertical central section. Fig. 3 is a detail view of the step-by-step mechanism. Fig. 4 is a detail view of the locking mechanism. Fig. 5 is a detail top view of the revolving head or face plate that bears the blank-holding jaws and showing the cam for opening the jaws. Fig. 6 is a side view of the same with parts broken away to show construction. Fig. 7 is a detail view in plan and section of a button partly formed on the blank. Fig. 8 is a detail edge view of the button cut from the blank.

In the accompanying drawings, the letter *a* denotes the bed of the machine as a whole; *b*, the standards; *c*, the driving-shaft, supported in suitable bearings *b'* and arranged lengthwise of the bed and beneath it; *d d'*, the reciprocating cutter-carriages; *e e'*, the cutter-beds, and *f f'* and *g g'* the cutter-spindles.

In the central opening *a'* in the bed of the machine is arranged a revolving head *h*, that is mounted on a shaft *i*, journaled in suitable bearings fast to the bed of the machine in such position that the head or face plate revolves in a vertical plane at right angles to and through the axis of the cutter-spindles. To the shaft *i*, that bears the head, is also secured a ratchet *j*, that forms a part of the feed mechanism by which the shaft is given an intermittent rotation, and fast to the same shaft *i* is a locking-disk *k*, having in its periphery indentations *k'*, into which the end of the vertically-arranged pawl *k²* is thrust by the agency of the spiral spring *k³*, arranged about the body of the pawl, the engagements of the pawl being determined by the rotations of the cam *k⁴*, that is mounted on and turns with the main shaft *c*. The ratchet-wheel *j* is operated by the pawl *j'*, that is connected to the rod *j²*, that extends from the eccentric-strap *j³*, that encircles the eccentric *j⁴*, that is fast to and turns with the main shaft *c*. By means of this feed mechanism the head *h* is rotated a certain distance, so that the blank-holding jaws *l* are moved into position in the line of the axis of the cutter-spindles and are held for a certain time in that position by means of the locking mechanism.

The function of the jaws *l* is to hold a blank, that is preferably a slab cut from a nut of vegetable ivory, while the cutters *f f'* are moved against and operate on the opposite faces of a button. The blank-holding jaws *l* are arranged at intervals around the periphery of the head *h*, with the lever-handle of the movable jaw extending radially inward toward the shaft *i*, and a spring *l'* is arranged beneath this inner end of each movable jaw in position to thrust it out, so as to force the outer end of the movable jaw toward the fixed jaw to hold a piece of stock firmly between them.

The carriages *d d'* are supported in ways on the top of the frame *a*, and are moved in and out toward the head *h* by means of the crank-pins *m m'* taking into the slots *d² d³* in the carriages. Each of these crank-pins projects upward from a disk borne on a vertical shaft *m² m³*, that is driven from the main shaft *c* by means of the intermeshing bevel-gears *n n'*. The cutter-beds *e* and

e' are each so secured to the carriages $d d'$ as to admit of lengthwise adjustment by means of the adjusting-screws $e^2 e^3$, that pass through the nuts fast to the carriage, with the inner end of the screw fitting into the threaded socket in the cutter-bed. The purpose of this adjustment is to determine with great nicety the extent and degree of the cutting operation of the cutters that are secured in the cutter-spindle. The outside of each of the nuts has a sort of skin that is very tough and adheres quite closely to the outer surface of the nut, and it is extremely hard. By the operation of these roughing-cutters this outer surface is removed and the button brought to its approximate shape or roughed out. The head then makes a partial revolution until the blank with the button roughed out is in proper position to be operated upon by the finishing-cutters, which by the operation of the machine are advanced a distance toward the head, the cutter g' first finishing the one side of the button and the cutter g the other side, and also cutting the button free from the blank and pushing it through the nut and end of the movable jaw, allowing it to drop from the machine.

The machine is so arranged that while the operation of roughing out the button is being carried on another button is being finished at the same time. As the head continues its revolution in a step-by-step movement, the jaws strike against a cam o , that is fast to the frame of the machine in such position that the jaws are opened as they sweep along the face of the cam and either allow the waste pieces of stock to fall out or so loosen them from the grasp of the jaws that the clearer p , that is fast to the bed in proper position to effect it, pushes the pieces out of the jaws. The jaws are held open by the cam until they have risen into position (see Fig. 2) to receive a piece of blank stock that is placed between them, and then the movable jaw is released from the cam and grasps the stock under the pressure of the spring and holds it

firmly by means of the teeth with which one surface of the jaws is provided.

This machine is preferably fed by hand, as the blank pieces of stock are of such irregular shape that some judgment is required in determining the proper position to obtain the best result in forming the button.

I claim as my invention—

1. The combination, with the driving-shaft provided with gears on its ends and the revolving head having blank-holding jaws, of the vertical shafts m^2 and m^3 , having gears to mesh with the gears on the driving-shaft and provided with eccentrics on their upper ends, and the reciprocating beds d' , carrying the rotatable shapers f , all substantially as described.

2. The combination, with the driving-shaft having the cams k^4 and j^4 , and the revolving head mounted on the shaft i , of a locking-disk k , mounted on the shaft of the revolving head and provided with indentations k' , the vertically arranged and reciprocating pawl k^2 , connected to the cam k^4 on the driving-shaft and provided with the spiral spring k^3 , arranged about the body of the pawl, the vertically-arranged pawl j^2 , connected to the cam j^4 on the driving-shaft, and the ratchet j on the shaft i , substantially as and for the purpose specified.

3. The combination, in a button-making machine, of the vertically-arranged rotatable shafts carrying eccentrics on their upper ends, the reciprocating tables connected to the eccentrics, the adjustable tables carrying the cutters, and the intermitting rotatable holding-head, all substantially as described.

4. The combination, with the rotating head carrying the spring-actuated clamping-jaws, of the cam o , to open the said jaws, and the clearer p , to push the pieces from the jaws, all substantially as described.

PHILIP A. OTIS.

Witnesses:

H. D. ROYCE,

CHAS. O. PARSONS.