

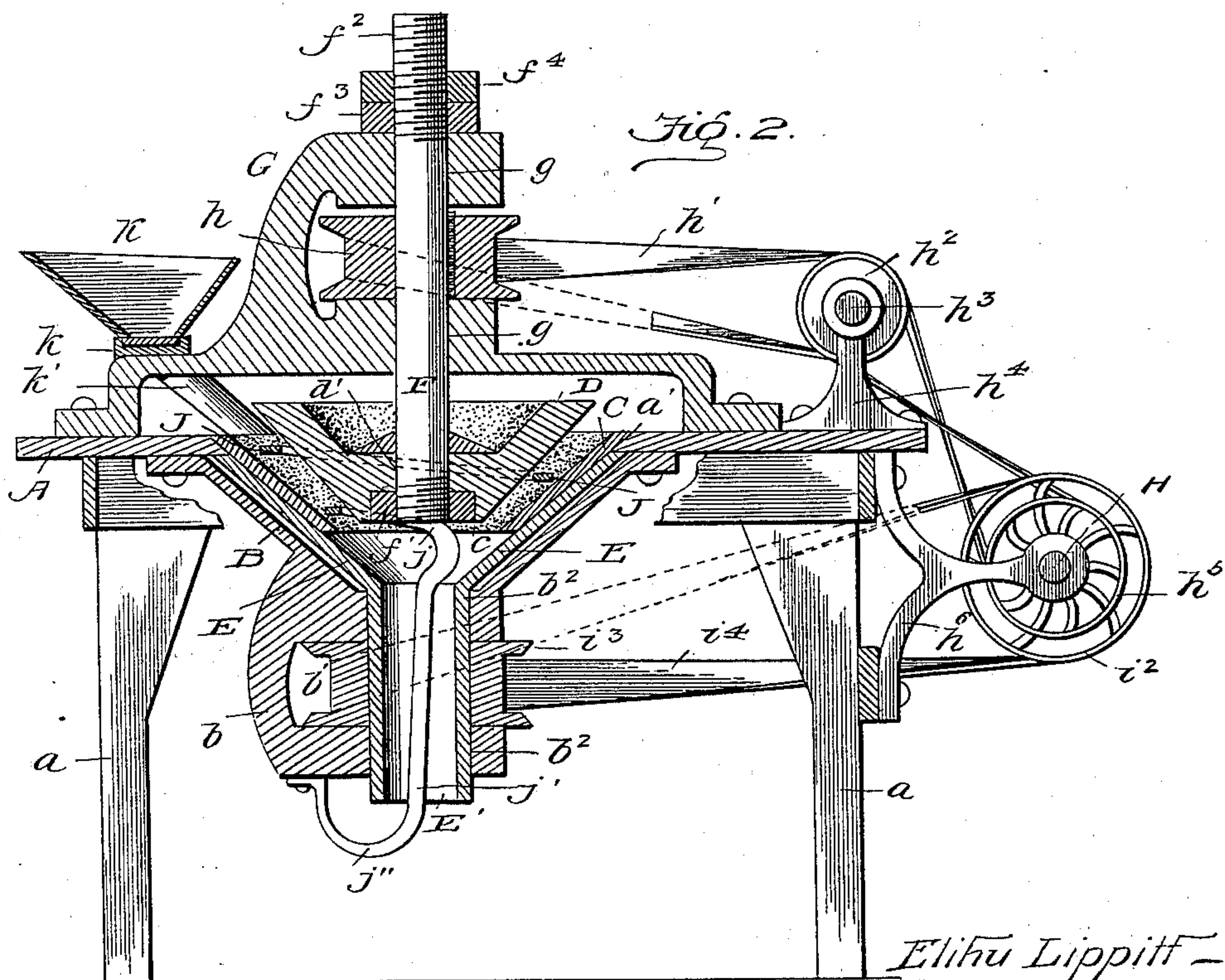
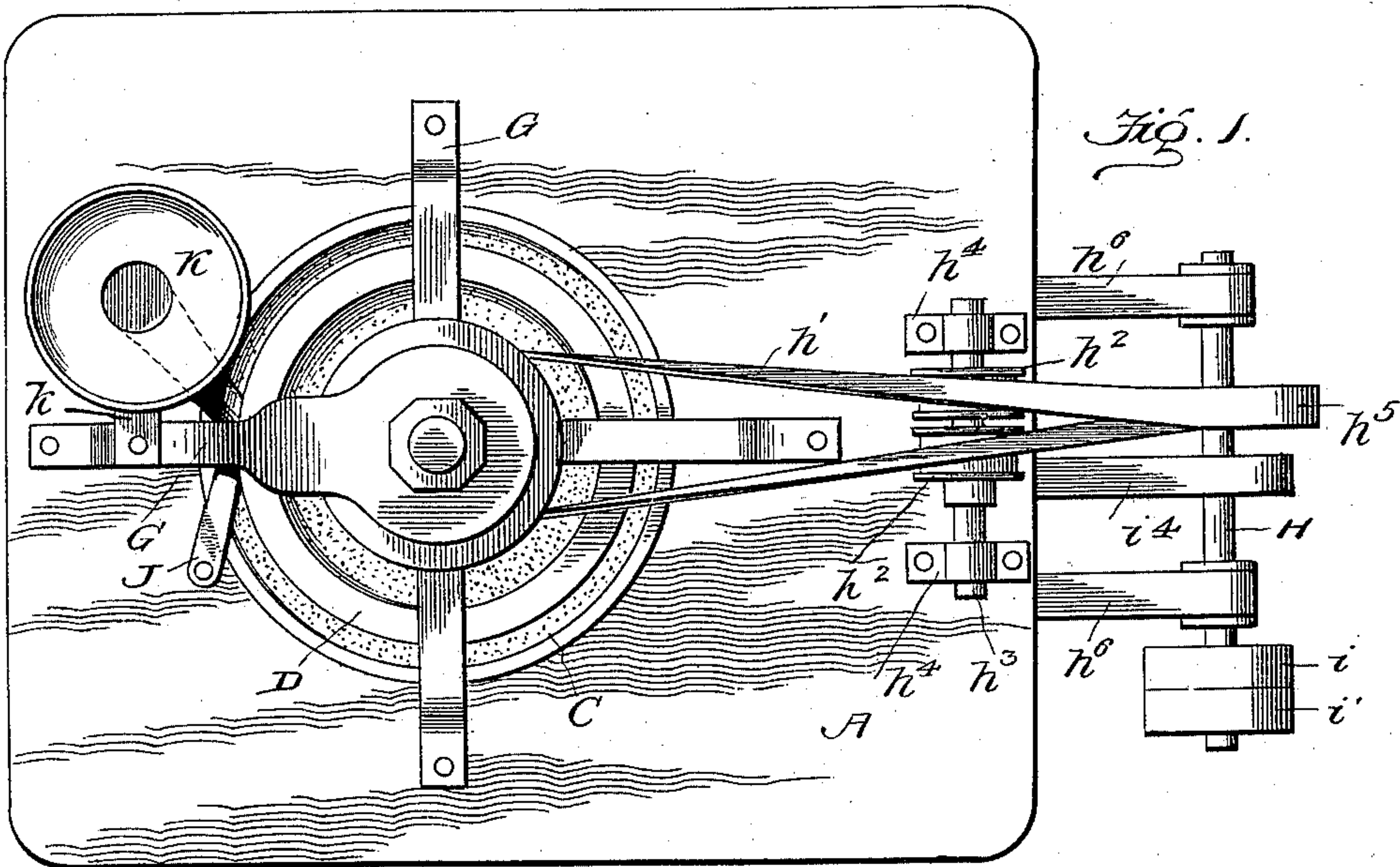
(No Model.)

2 Sheets—Sheet 1.

E. LIPPITT.
BUTTON MAKING MACHINE.

No. 578,647.

Patented Mar. 9, 1897.



Witnesses:

Wm. O. Ashiee
J. A. Mothershead

Elihu Lippitt—
Inventor—

By Edouard Bros.
Attys.

(No Model.)

2 Sheets—Sheet 2.

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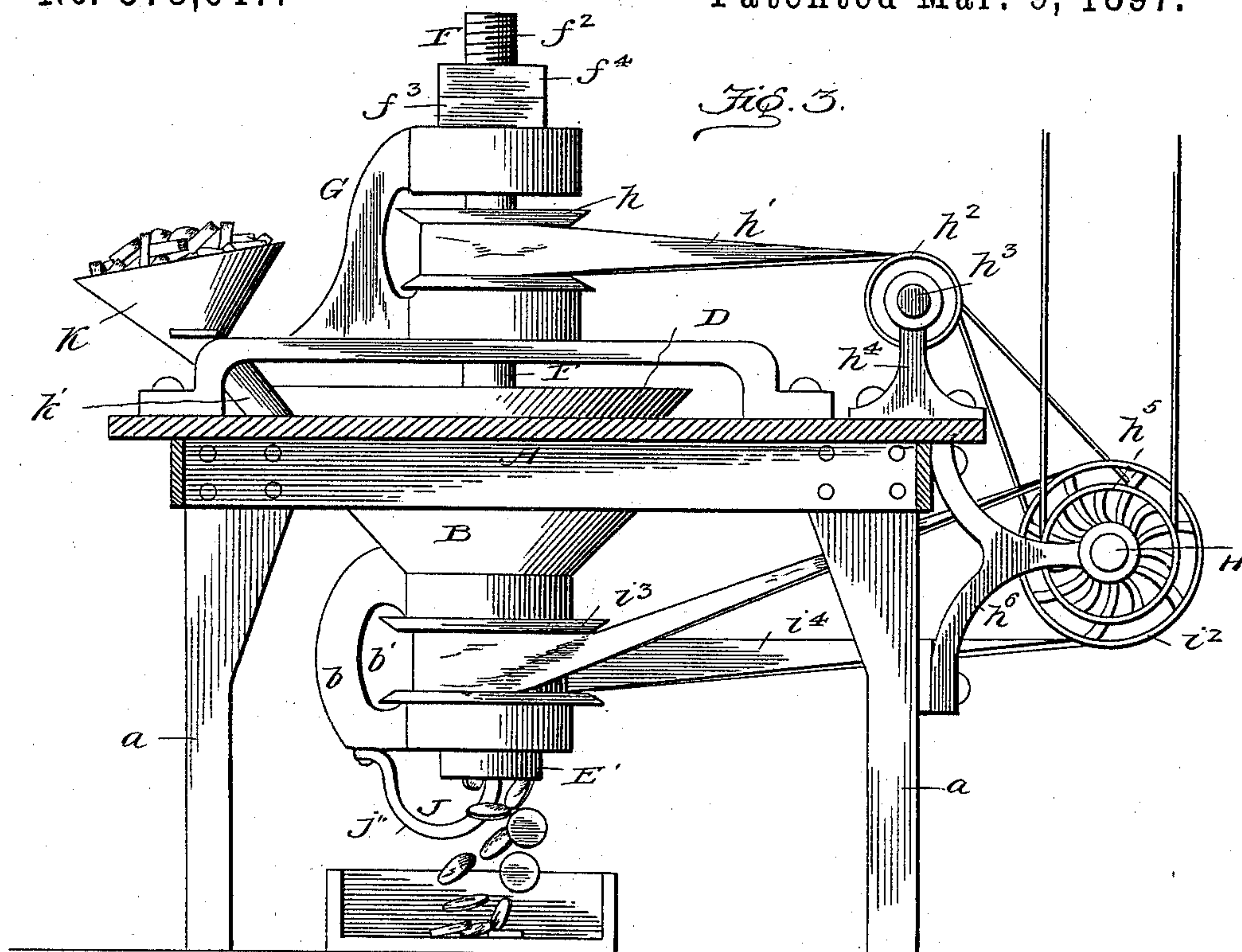


Fig. 4.

Fig. 5.

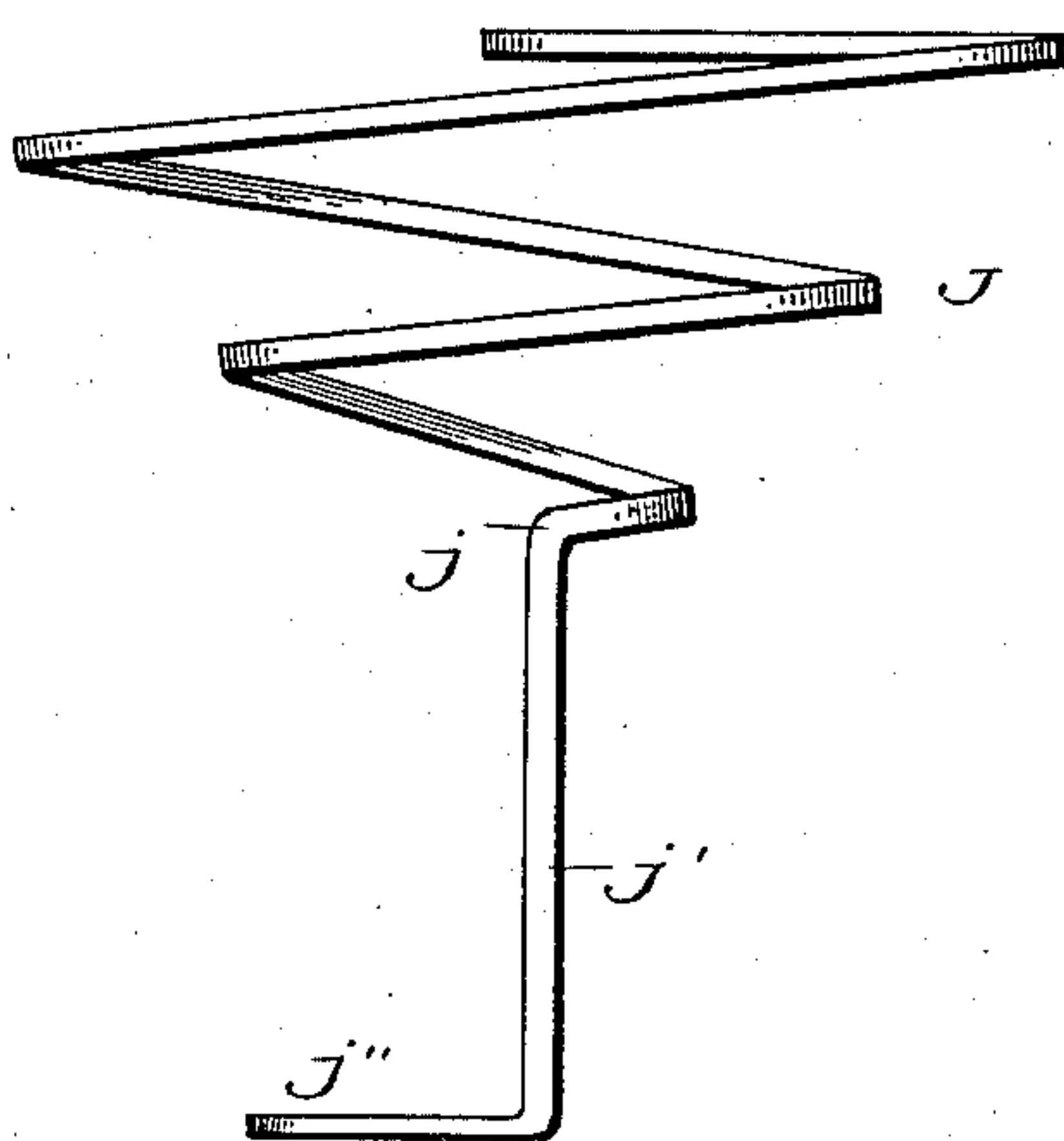
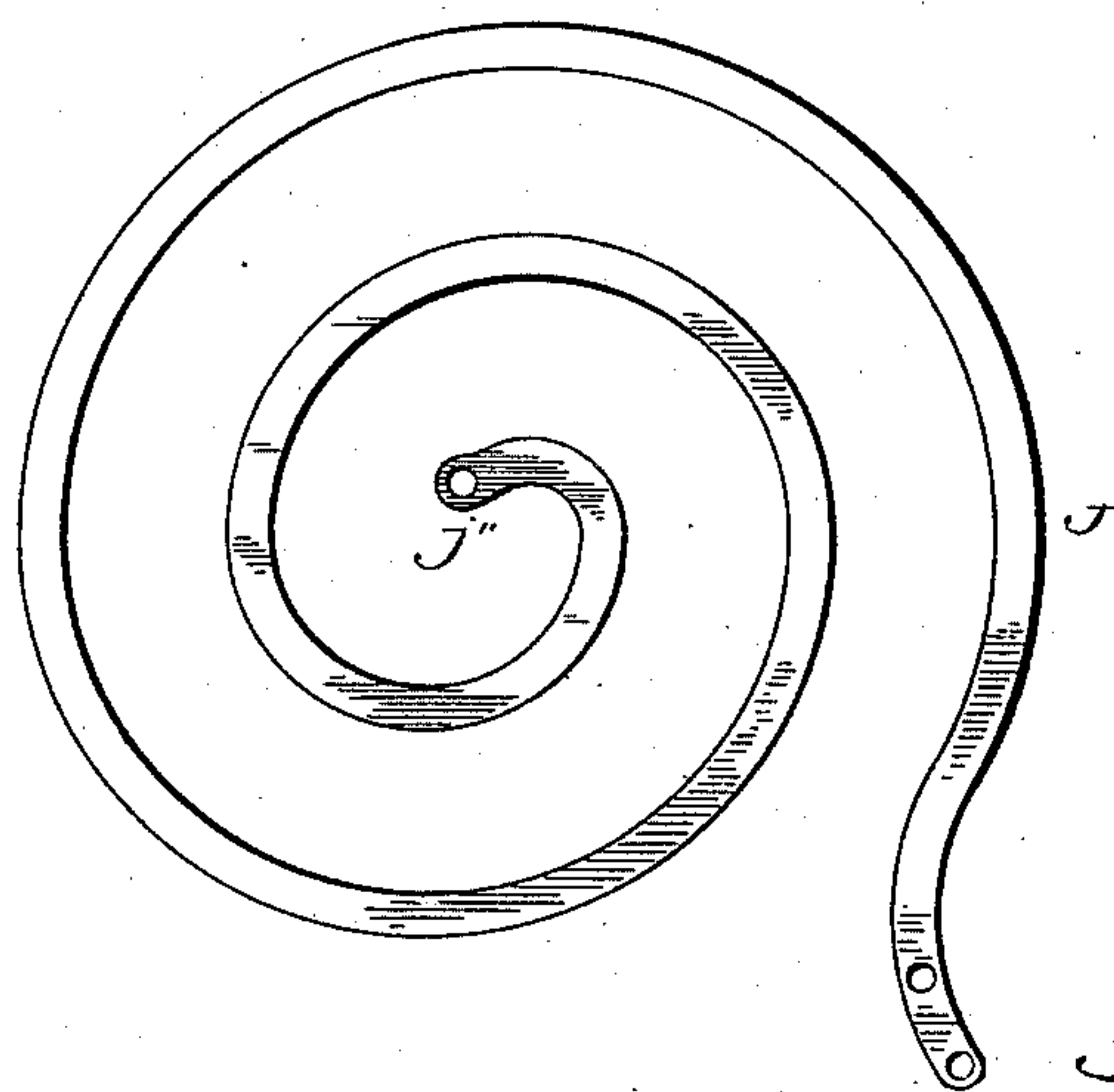
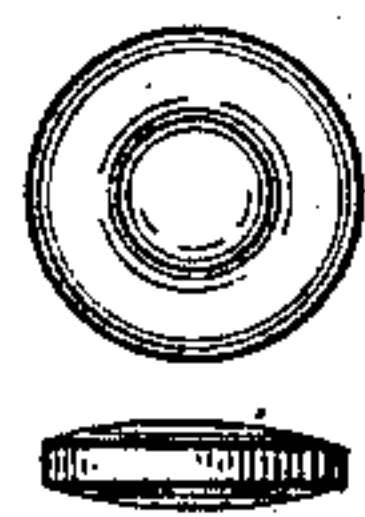
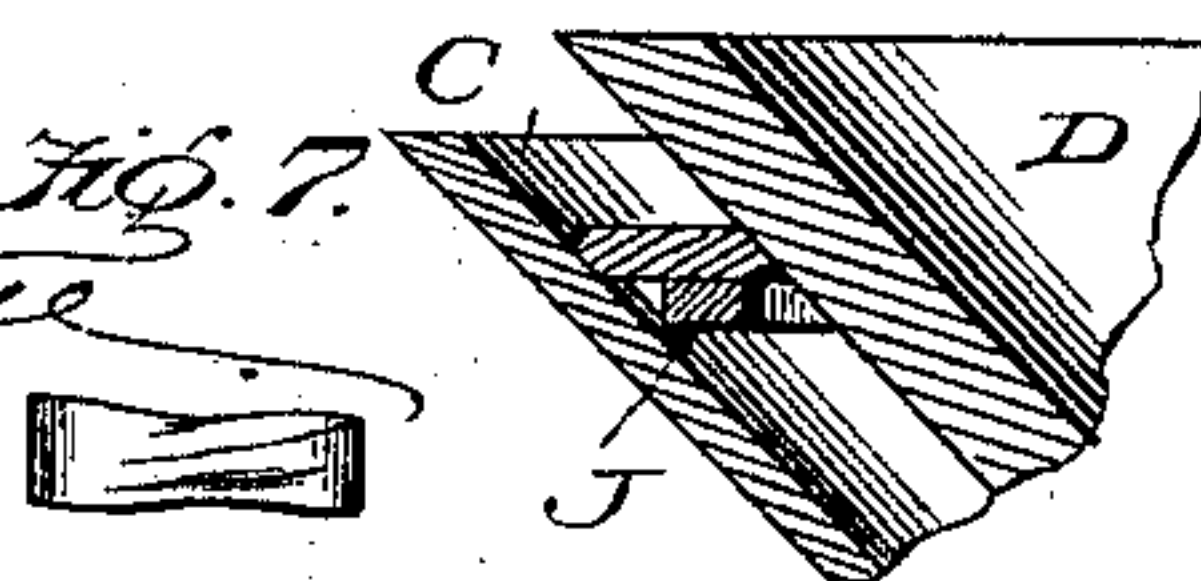


Fig. 6.

Witnesses: *Wm. Washette*
J. M. Threshed



Elihu Lippitt.
Inventor:
Fig. 8.
By *Edson Brox.*
Attys.

UNITED STATES PATENT OFFICE.

ELIHU LIPPITT, OF CLEVELAND, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS,
TO THE BUCKEYE PEARL BUTTON COMPANY, OF SAME PLACE.

BUTTON-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 578,647, dated March 9, 1897.

Application filed February 27, 1896. Serial No. 580,931. (No model.)

To all whom it may concern:

Be it known that I, ELIHU LIPPITT, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Button-Making Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is an improvement in machines for grinding and polishing buttons of pearl or other materials in which the abrading devices are so combined as to operate on and finish the outer portion of the two sides or faces of each button-blank during the progress of said blank through the machine.

A further object of my invention is to automatically feed the button-blanks from a hopper to the abrading mechanism, to direct the button-blanks mechanically while under treatment from the abrading mechanism, and to discharge the finished blanks into a suitable receptacle, all of which is accomplished without requiring the care of an attendant.

The first part of my invention resides in an abrading mechanism consisting of oppositely-rotating cones arranged one within the other and with their opposing working surfaces so spaced apart as to provide a passage or space between said cones for the travel of the button-blanks, combined with means to direct the button-blanks to travel in a serpentine course between and around the abrading-cones and to expose both faces or sides of the button-blanks to the action of the male and female cones.

The invention further consists in the mode of hanging the two abrading-cones to permit the feeding and discharge of the button-blanks, and in the preferred embodiment of the invention the female abrading-cone has an opening in its smaller lower end, and it is mounted in a conical carrier on a hollow shaft or spindle suitably journaled in the machine-framing. The male abrading-cone is suspended within the female cone by being secured on a vertical shaft journaled in an overhanging bracket, and this hollow spindle and the upper shaft, together with the two abrad-

ing-cones, are driven in opposite directions by suitable connections with a power-shaft. The button-blanks are fed from a suitable hopper, through the medium of a spout, to and between the abrading-cones. To properly direct the button-blanks between the cones, so as to expose the two faces of the blanks to the opposing working surfaces of said cones, I have devised a track or guide which extends in a worm or serpentine form between said abrading-cones, one end of said track or guide receiving button-blanks from the hopper-spout, while the opposite discharge end of the track or guide passes through the open lower end of the female cone and through the hollow spindle or shaft, so that an abrupt bend is provided in the track or guide, at which point the button-blanks are to be discharged into the hollow spindle and through said spindle into a suitable receptacle; and the invention further consists in the novel combination of devices and in the construction and arrangement of parts which will be hereinafter fully described and claimed.

To enable others to understand my invention, I have illustrated the preferred embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a plan view of a button-making machine constructed in accordance with my invention. Fig. 2 is a vertical sectional elevation taken centrally through the grinding mechanism and the machine. Fig. 3 is a side elevation of the machine. Figs. 4 and 5 are detached views of the helical feed-track in plan and side elevation, respectively. Fig. 6 is a detail sectional view showing a portion of the two cones with the intermediate track and illustrating a button-blank in position for operation on by the cones. Fig. 7 is a view of an untreated button-blank, showing its form when placed in the hopper. Fig. 8 shows the button-blank in plan and edge view of the treated button-blank.

Like letters of reference denote corresponding parts in the several figures of the drawings.

The table or bed A of the machine is supported by suitable legs *a* at the proper height above the floor, and on this table or bed all

the operative and driving parts of the machine for grinding and finishing button-blanks are supported. In the table or bed is a large opening a' for the accommodation of the abrading devices, and to the bottom side of said table or bed is rigidly fastened a conical bearing B, which terminates in a pendent bracket-hanger b , that is recessed at b' to accommodate the lower driving-pulley, said bracket and conical bearing B being shaped to form the vertically-aligned journal-bearings $b^2 b^2$.

C D designate the two abrading-cones, the axes of which are vertical. The lower female cone C and the upper male cone D are so hung or suspended as to leave a space between the opposing faces of the two cones for the passage of the button-blanks. The conicity of the male cone D is different from the conicity of the female cone, and said cones are arranged one within the other to make the space between the two cones narrower or tapering from the upper ends, where the blanks are fed between the cones, to the lower ends of the cones, where the blanks are discharged from the cones, as indicated by Fig. 2 of the drawings, in order that the opposing faces of the two cones operate on the blank progressively as it is conducted through such narrowing or tapering space in the passage of the blank between the cones and around the axial line thereof. This lower female cone is fixedly mounted in a conical carrier E, which is fitted or journaled to rotate freely in the fixed conical bearing B, and said carrier E terminates in a central pendent spindle or shaft E' , journaled in the bearings $b^2 b^2$.

Through a vertical opening d' in the male abrading-cone passes the lower threaded end of the vertical shaft F, and to this threaded end of the shaft is screwed a nut or nuts f , which is fitted in a suitable aperture in the lower end or apex of the male cone, as shown by Fig. 2, whereby the male cone is fastened to the shaft F to rotate therewith. This shaft is journaled in bearings $g g$ of the spider-like four-legged bracket G, which is bolted to the top side of the bed or table A, so as to overhang the lower female cone C, and the upper end of said vertical shaft F is threaded, as at f^2 , to receive the adjusting-nuts $f^3 f^4$. The lower nut f^3 rests on the top of the bracket G, and these nuts serve to suspend the shaft F and male cone D, as well as to provide for the vertical adjustment of said shaft and the cone D carried thereby, thus providing simple means for adjusting the male cone relatively to the female cone.

The means for rotating the spindle or shaft E' and the suspended shaft F contemplates taking the power from a single shaft H through the medium of suitable gearing arranged to drive the two shafts in opposite directions.

On the vertical suspended shaft F is splined a pulley h , which is arranged in the recess of the bracket G, and around this pulley h passes a belt h' , that operates to rotate the pulley h ,

the shaft F, and the cone D. Said belt h' passes over the idler-pulleys $h^2 h^2$ on an idler-shaft h^3 , journaled in bearings on a bracket h^4 , attached to the bed or table A, and said belt h' also passes around a driving-pulley h^5 on the power-shaft H. This power-shaft H is journaled in bearings of the bracket h^6 , attached, preferably, to the side of the table A, and on the shaft H is secured the fast and loose power-pulleys $i i'$ and the driving-pulley i^2 for operating the shaft or spindle E' . On this shaft or spindle E' is secured a pulley i^3 , which is fitted in the recess b' of the bracket-hanger b , and around the pulleys i^2 and i^3 passes the endless crossed belt i^4 , which transmits the motion from the power-shaft H to the spindle or shaft E' .

The apex or lower end of the female cone C has an opening c , and the depth of this female cone is less than the depth of the conical carrier E, in which the cone is secured, as shown by Fig. 2. The spindle or shaft E' is hollow, as shown, and the button-blanks are discharged from the machine after they have been subjected to the abrasive action of the two cones C D by passing through the opening c of the female cone C and through the hollow shaft or spindle E' , so that the finished button-blanks may be delivered into a suitable receptacle. (See Fig. 3.)

The track or guide J for the button-blank is of spiral or serpentine form, and it is arranged between and out of contact with the two rotating cones. Said track or guide extends two or more times around the male cone D and within the female cone, and the convolutions of said wormlike or helical track are properly spaced apart to provide for the passage of the button-blanks between the upper and lower parts of said track or guide. The upper end of this wormlike or helical track extends out over the upper edge of the female abrading-cone C, and it is fastened in a secure manner to the table A, as shown in Fig. 1. The track or guide J, at the point where it passes through the opening c in the apex of the female cone C, has an abrupt bend j , and from this bend the track extends, in the form of a vertical stem j' , down through the hollow shaft or spindle E' and terminates in a bent foot j'' , which is rigidly attached to the bracket-hanger b' . (See Figs. 2, 3, and 5.) It will be noted that the two ends of the helical track or guide are attached to the machine-framing and that the track is thus sustained with its coiled or helical portion in position between and out of contact with the oppositely-revolving abrading-cones.

K is the hopper or funnel for the button-blanks, which is attached to a fixed bracket k . From the lower side of this hopper extends the spout or chute k' , which is inclined, as shown, and arranged to bring the delivery end thereof over the upper end of the coiled or helical track J. This chute receives the button-blanks from the hopper K and delivers them to the coiled part of the track J in

position to be acted on by the abrading-cones. The button-blanks, which are prepared in disklike form previous to depositing them in the hopper, glide along this helical or coiled track between the two abrading-cones, and both faces or sides of each button-blank are exposed to treatment by the two cones as the button-blank passes along said track toward the discharge-opening *c* in the female cone.

10 This track is arranged, mainly, in the tapering space or passage between the working surfaces of the cones, and the width or thickness of said track is less than the diameter of the button-blanks and is also less than the

15 width of the space between said cones in order that the track may not come in contact at any point with the working faces of the cones and to so support the button-blanks that they will always be sustained in operative relation to the working surfaces of the cones. As the button-blank reaches the abrupt bend *j'* in the track it leaves the track and drops through the hollow spindle *E'* into a suitable receptacle.

25 In Fig. 7 of the drawings I have shown a pearl-button blank in condition to be placed in the hopper, and from an inspection of this figure it will be seen that the blank is prepared in disk form, but the faces and edges

30 of the blank are quite uneven or irregular. These blanks are deposited indiscriminately in the hopper, which has a suitable slide or valve to control the egress of the buttons to the chute *k'*, by which the blanks are deposited on the feed track or guide *J*. The buttons slide or glide down this track between the two cones, and said cones and the feed-track are arranged as described in order that the button-blank, while resting on and carried along the track, will be presented to the opposite working faces of the two cones, which will operate on the two sides or faces of the blank, near the peripheral edges of the same, and progressively finish said faces of the

45 blank as the latter passes through the tapering or narrowing space between said cones and around the vertical axial line of the cones, the method of grinding and finishing the blank being indicated, substantially, by Fig.

50 6 of the drawings. The two cones are rotated simultaneously, but in opposite directions, and the male cone is rotated at a higher speed than the female cone and in a direction to carry the button-blank in a path down and

55 along the feed track or guide. As the blank rests loosely on the feed-track, and as it is presented in a manner to have the cones act near its outer portions on the faces of said blank and said faces are treated progressively

60 by the cones as the blank is carried through the tapering space between the cones, the rapidly-revolving male cone acts to turn or rotate the blank on the feed-track, so as to present the outer portion of each face of the blank to the inclined working faces of the two cones. The faces of the blanks, near the peripheral edges of the blanks, are both

treated and finished until the blanks reach the discharge-bend of the feed track or guide, the finished blanks dropping through the hollow vertical shaft into the receptacle provided to receive the blanks, as shown. 70

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

1. In a button-making machine, the combination of a grinding mechanism comprising abrading-cones arranged one within the other with their working surfaces opposite to each other, and a feed mechanism situated between said cones for presenting button-blanks in operative relation to said working surfaces of the cones, as and for the purposes described. 75 80

2. In a button-making machine, of a grinding mechanism comprising a female abrading-cone having an inner working surface, and a male abrading-cone supported, partially or wholly, within the female cone to have its outer working surface opposed to the inner working surface of said female cone, combined with mechanism for driving one or both of said cones, and a feed device extending between the cones to present button-blanks to the working surfaces of said cones, substantially as and for the purposes described. 85 90 95

3. In a button-making machine, the abrading-cones arranged one within the other to have their working surfaces opposed to each other, in combination with an irregular feed track or guide situated between said abrading-cones, to present button-blanks to the working faces of both cones, substantially as and for the purposes described. 100

4. In a button-making machine, the combination of abrading-cones, arranged one within the other, and a helical or coiled feed guide or track supported between, and out of contact with, the working surfaces of said abrading-cones, as and for the purposes described. 105 110

5. In a button-making machine, the combination of abrading-cones arranged one within the other and having their working surfaces opposed to each other, means for rotating said cones in opposite directions, and a fixed feed track or guide having a helical or spiral portion situated between the working surfaces of said abrading-cones, substantially as and for the purposes described. 115

6. In a button-making machine, the combination of a female abrading-cone, a male abrading-cone supported within said female cone, and a feed track or guide attached at its ends to the machine-framing and having a helical or coiled portion which surrounds the male cone and is within the female cone, substantially as and for the purposes described. 120 125

7. In a button-making machine, the combination of a female abrading-cone having an opening at its apex, a carrier in which said cone is mounted, a hollow spindle or shaft rigid with said carrier and arranged to receive button-blanks as they are discharged through 130

the opening in the female cone, a male cone suspended within said female cone, means for rotating one or both of said cones, and a feed mechanism to direct button-blanks between the working surfaces of said cones, substantially as and for the purposes described.

8. In a button-making machine, the abrading-cones, the axes of which are vertical, arranged one within the other, and the female cone having a discharge-opening at its apex, in combination with a hollow spindle, a carrier mounted on said spindle and attached to the female cone, a suspended shaft attached to the male cone, and a helical or spiral feed-track situated between said cones and having its upper end attached to the machine-framing and with its other end carried through said hollow spindle and also attached to the machine-framing, substantially as described.

9. The combination of a female abrading-cone having a discharge-opening *c*, a hollow spindle below said discharge-opening, a carrier attached to the spindle and to the female cone, a feed-track situated in said cone and the spindle and having a discharge-bend at or about the point where it passes through female cone, a male cone suspended within said female cone, and means for rotating said cones, substantially as and for the purposes described.

10. The combination of a female abrading-cone, the axis of which is vertical, of a male

abrading-cone suspended within said female cone and adjustable relatively thereto, and a feed device to direct blanks between the working surfaces of said abrading-cones, substantially as and for the purposes described.

11. In a button-making machine, the combination of a hollow spindle having the carrier, a female abrading-cone supported on said carrier and having a discharge-opening at its bottom, a vertical shaft carrying a male cone which is arranged within the female cone, a power-shaft, gear connections between said power-shaft and the two cone-shafts, and a feed device situated between the working faces of said abrading-cones, substantially as and for the purposes described.

12. In a button-making machine, an abrading mechanism consisting of oppositely-rotating cones arranged one within the other and having opposing working faces and one cone rotating at higher speed than the other cone, combined with a feed track or guide along which button-blanks are adapted to move and to present their faces to the working surfaces of said cones, substantially as and for the purposes described.

In testimony whereof I affix my signature in presence of two witnesses.

ELIHU LIPPITT.

Witnesses:

EDWARD J. MAGUIRE,
DANIEL R. TAYLOR.