

No. 751,822.

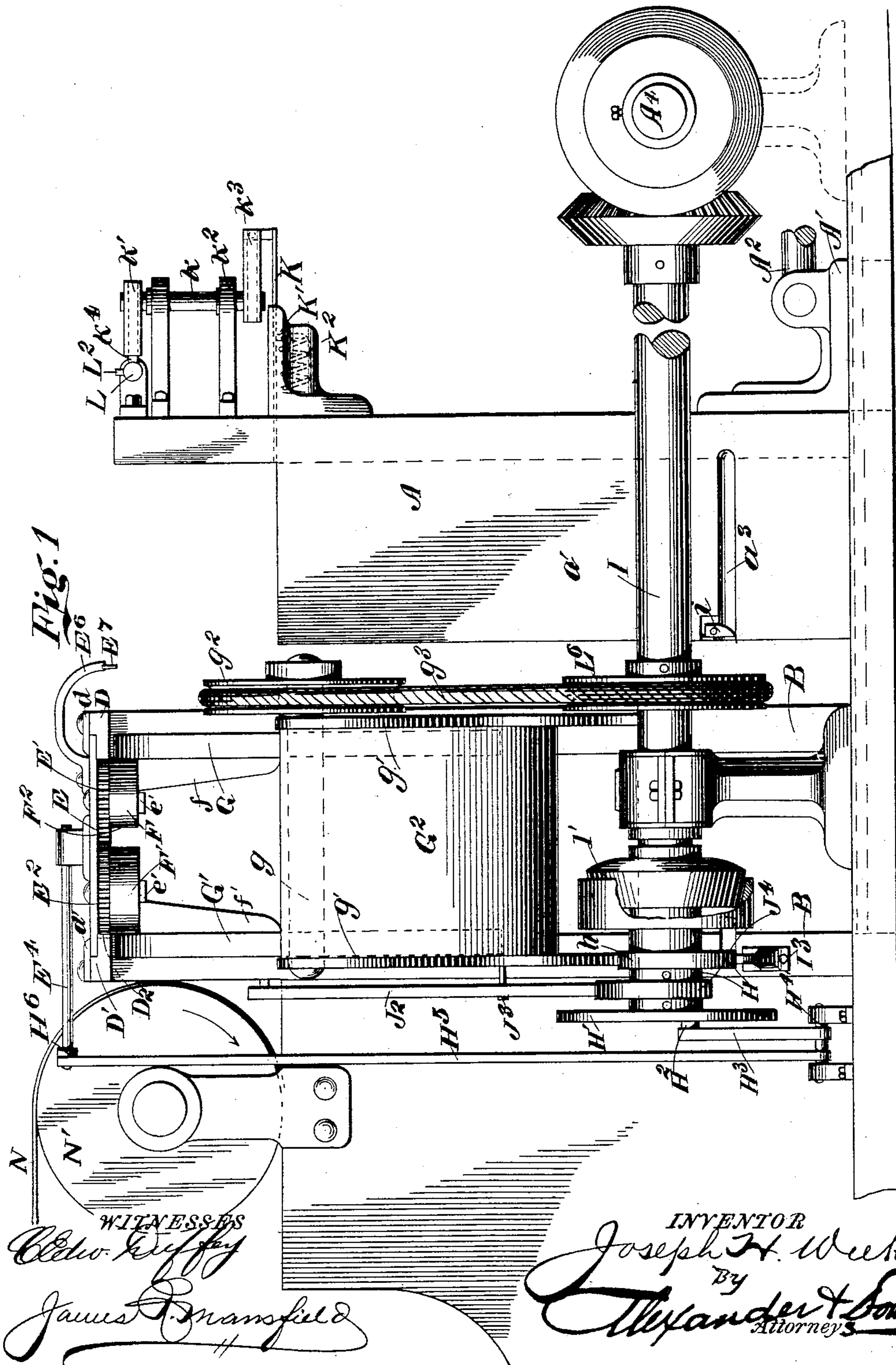
PATENTED FEB. 9, 1904.

J. H. WEEKS.
CARTON SEALING MACHINE.

APPLICATION FILED MAY 18, 1903.

NO MODEL.

4 SHEETS—SHEET 1.



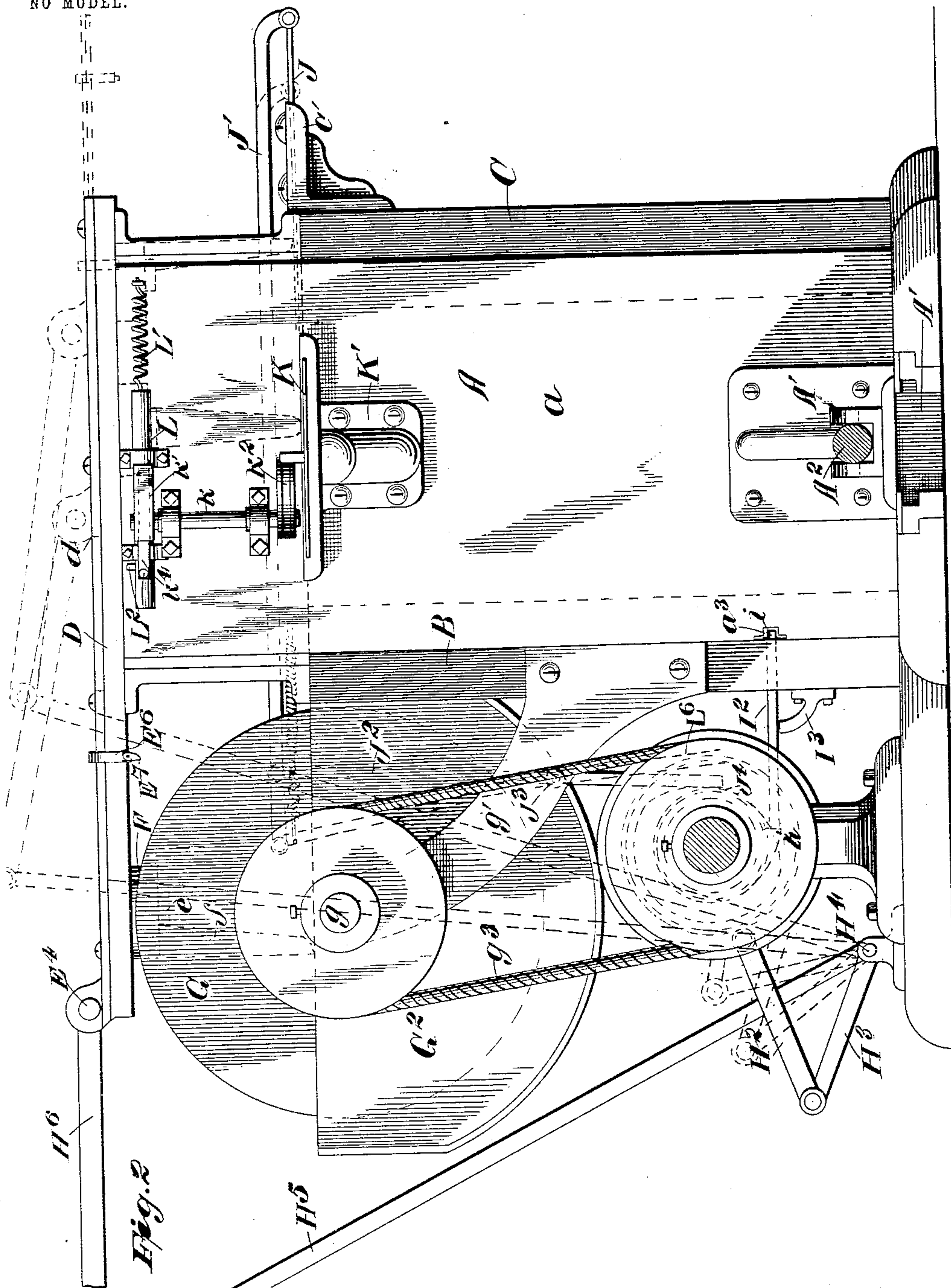
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4 SHEETS—SHEET 3.

Fig. 3

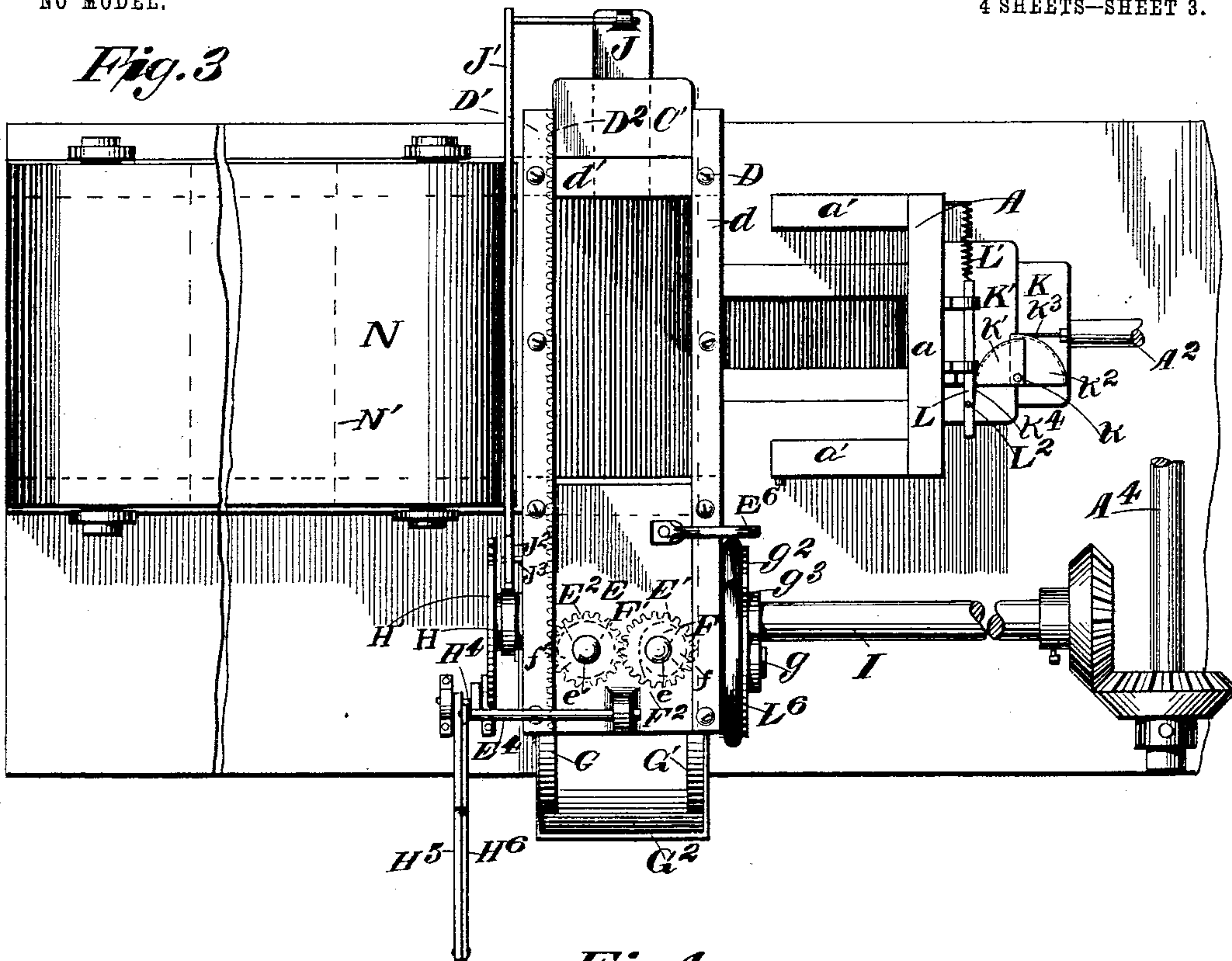
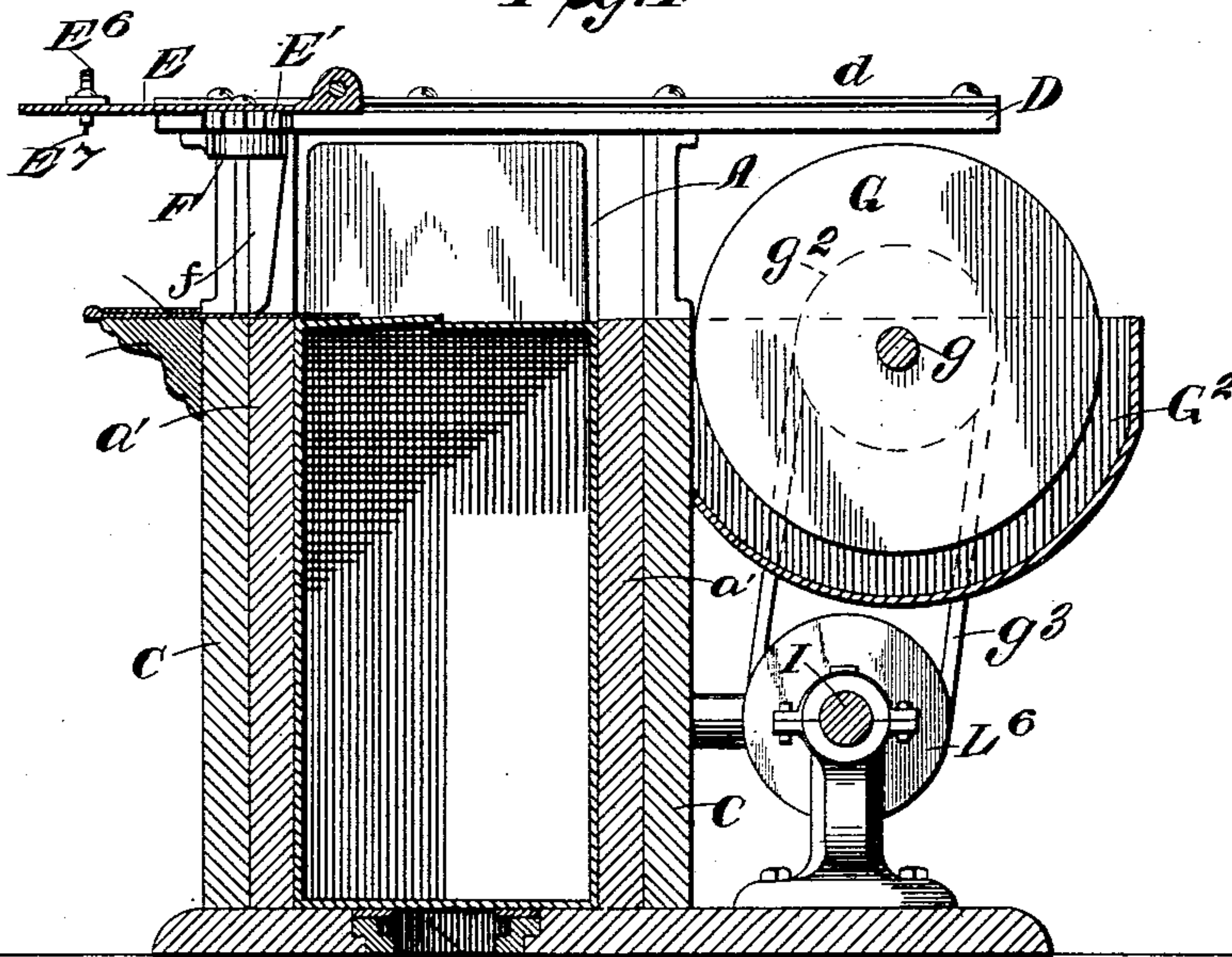


Fig. 4



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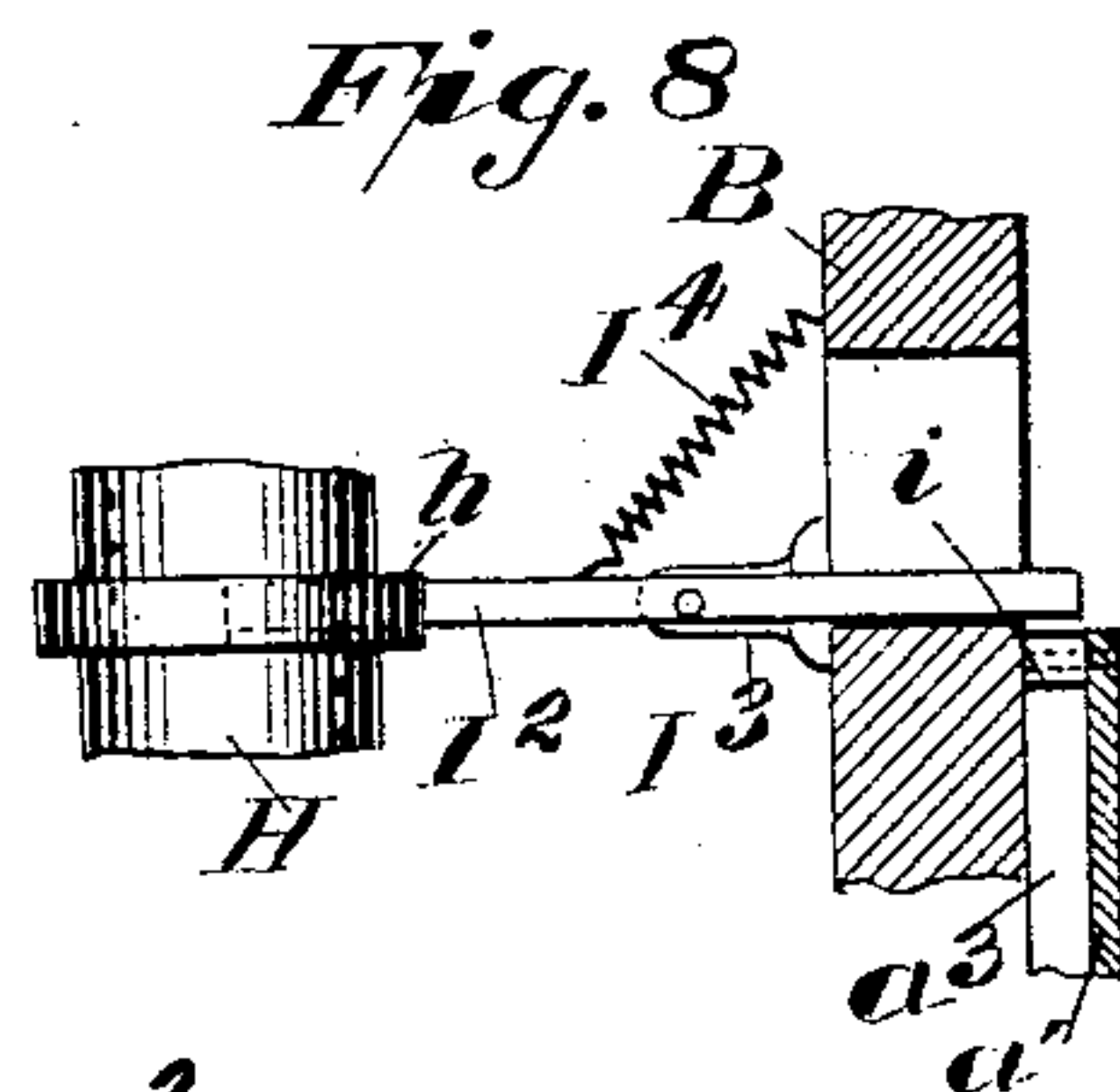
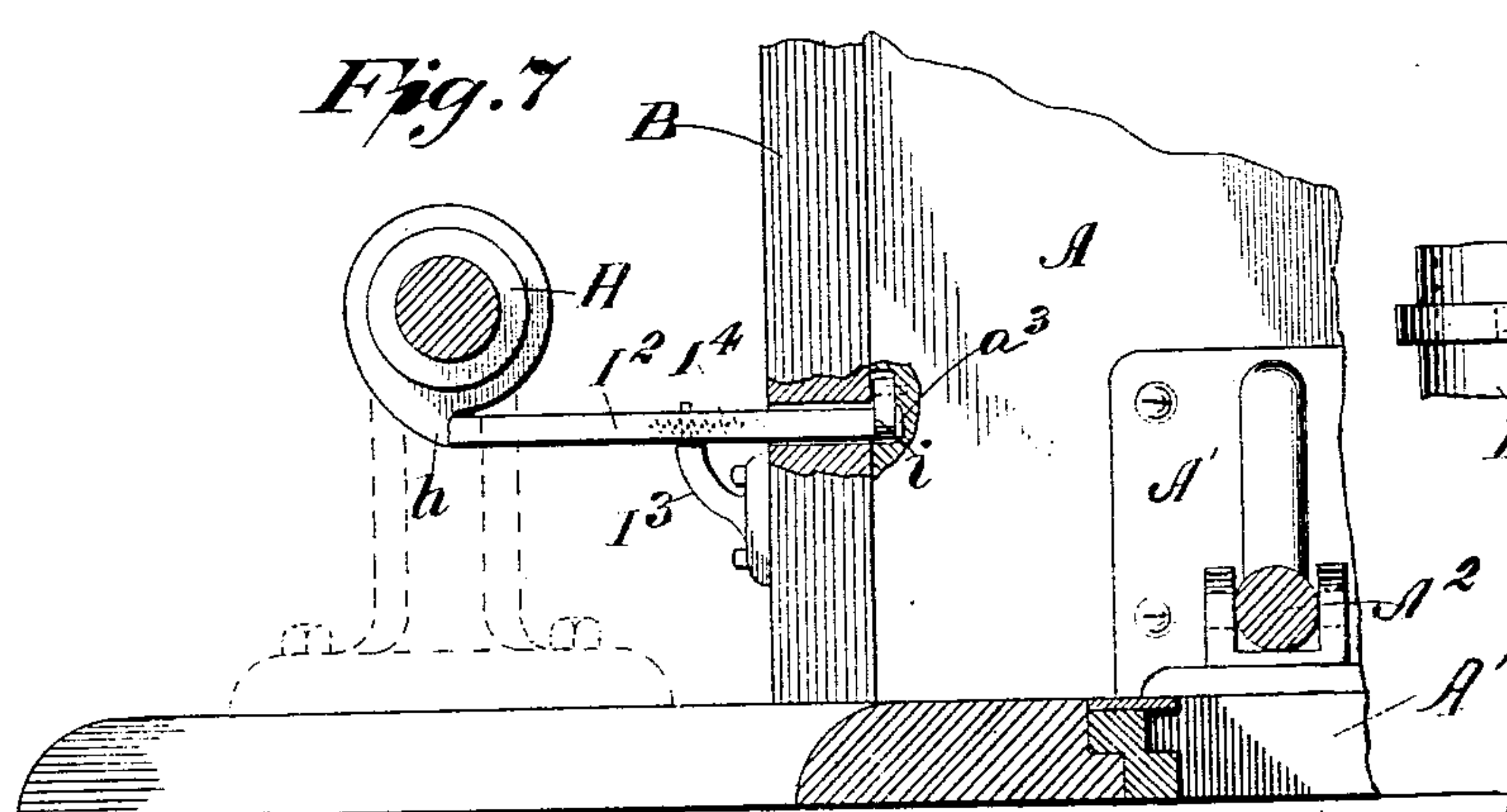
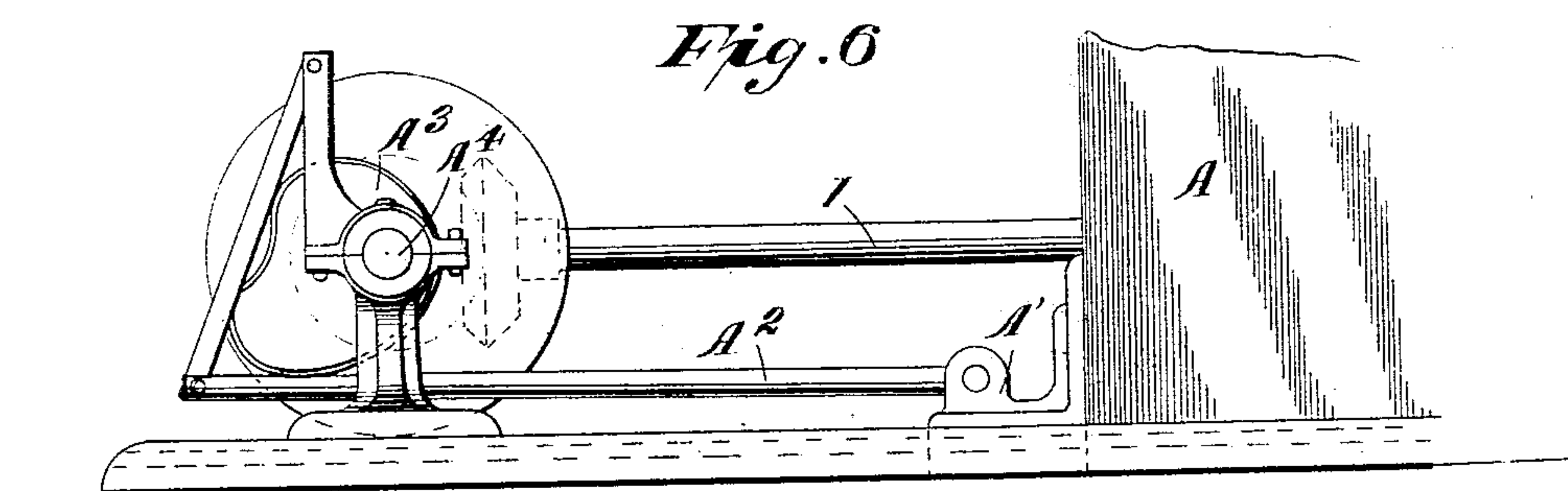
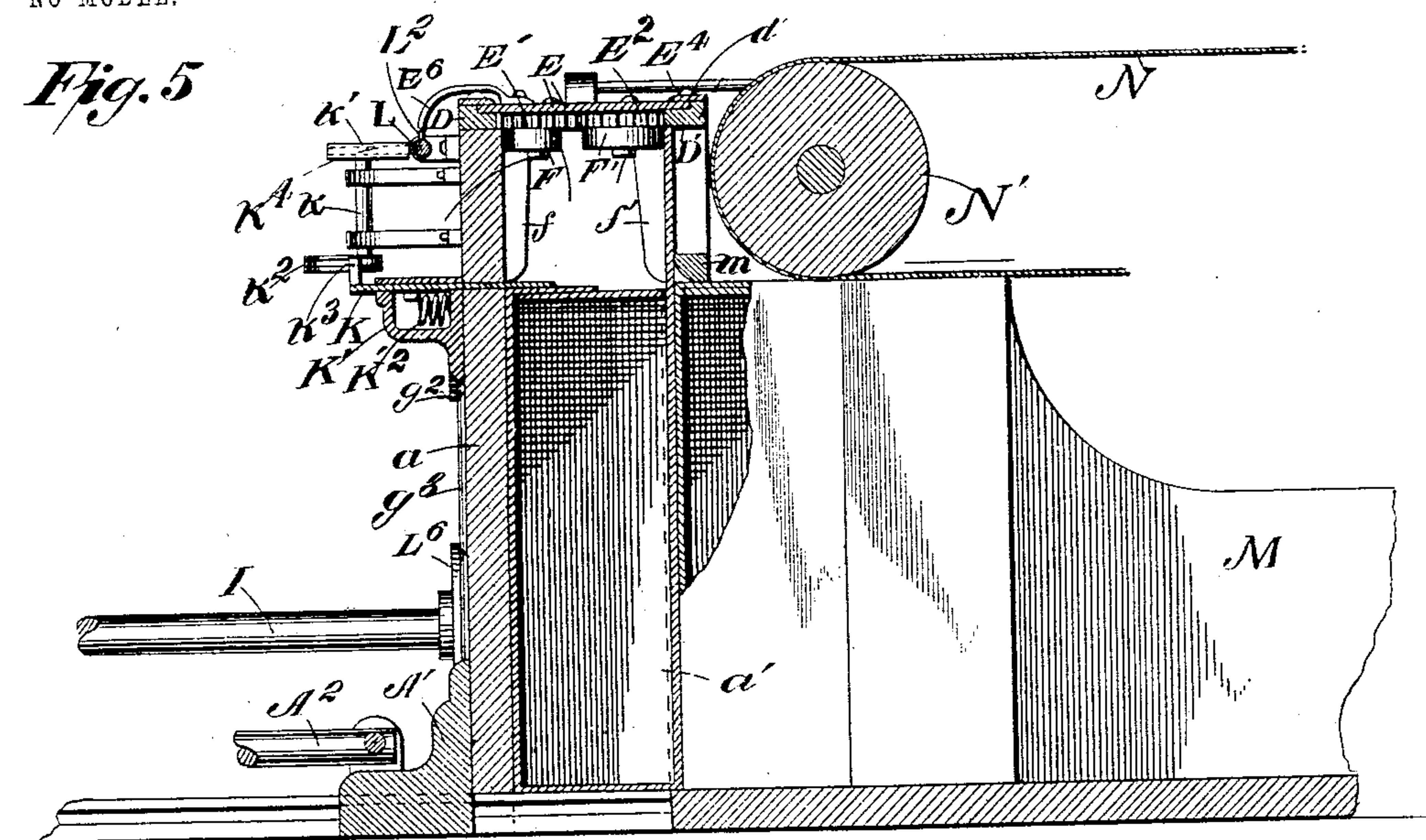
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

JOSEPH H. WEEKS, OF BATTLECREEK, MICHIGAN.

CARTON-SEALING MACHINE.

SPECIFICATION forming part of Letters Patent No. 751,822, dated February 9, 1904.

Application filed May 18, 1903. Serial No. 157,636. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH H. WEEKS, of Battlecreek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Carton-Sealing Machines; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improved machine for sealing cartons, especially designed for sealing the four end flaps of cartons after the same have been filled; and the object of the invention is to provide efficient rapidly-acting flap pasting and folding mechanism, whereby the flaps are folded in proper sequence and the paste applied thereto in such manner that the cartons will be securely sealed on both end and side edges of the top. The pasting and folding mechanisms are equally well adapted to operate upon suitably-supported empty cartons to fold and close the end thereof, if desired, and therefore either use of the invention is intended to be embraced herein; but I have shown the mechanisms as used for closing filled cartons, and the following explanation thereof will impart a clear understanding of the invention and the material features and combinations therein for which protection is desired.

In the accompanying drawings, Figure 1 is a side elevation of a complete machine embodying my invention for folding and sealing cartons. Fig. 2 is a front end view thereof, partly broken. Fig. 3 is a top plan view. Fig. 4 is a longitudinal section through Fig. 1, showing the parts in positions assumed during folding. Fig. 5 is a section through Fig. 2, showing parts in positions assumed during folding. Figs. 6, 7, and 8 are detail views.

A represents a movable carton holder and pusher, composed of a front plate *a* and opposite side plates *a'*, attached to the sides of plate *a* and projecting rearwardly therefrom, plates *a a'* being of a size designed and adapted to receive and surround three sides of a carton to be sealed. The holder is mounted upon a reciprocating slide *A'*, supported and guided in the base-plate of the machine, said

slide being operated by a rod *A²*, which is actuated at the proper times and in proper manner by a cam *A³* on a shaft *A⁴*, so as to shift the holder as required during the operation of the machine. The cam *A⁴* is so shaped that the holder is moved inward by two successive steps and moved outward by one long step. The third or front flap folder is attached to the holder and constructed and operated as hereinafter explained.

The machine is designed to operate on cartons having four end flaps, and after such a carton is dropped into the holder with its upper flaps open the holder is first moved inward, so as to bring the carton in position for pasting and folding its top flaps, the pasting of the third and fourth (front and rear) flaps being effected by the following devices, which also serve to fold the first flap: Arranged at opposite sides of the path of the holder (in such position that the latter will stop therebetween after it has made its first step forward) are uprights *B* and *C*, upon which are supported transversely-disposed horizontal guide-bars *D D'*, upon which rest and move a transversely-reciprocating slide *E*, which is confined on the guide-bars by plates *d d'*, as shown. Depending from said slide are two adjacent studs *e e'*, on which are journaled intermeshing pinions *E' E²*, pinion *E²* meshing with a rack *D²* on the inner face of guide *D'*, as shown, so that as the slide *E* reciprocates the pinions *E' E²* will be caused to rotate. Secured to the under side of pinions *E' E²* are pasting-disks *F F'*, which are adapted to apply paste to the inner upper edges of the front and rear flaps of the carton before they are folded, and depending from the said disks are peripherally disposed arms or wing-pasters *f f'*, which are adapted to apply paste to the side edges of said front and rear flaps, as hereinafter explained. The disk *F* may be cut away, as at *F²*, so it will not apply paste at the central part of the front flap where the latter overlaps the meeting edges of the folded side flaps. The pasters receive paste from disks *G G'*, fixed on a shaft *g*, journaled in brackets *g'*, attached to uprights *B B'*, which dip into a paste-receptacle *G²*, supported by brackets *g'*, as shown. The shaft *g* and disks *G G'* may

be rotated by means of a pulley g^2 on one end, driven by a belt g^3 from a pulley 16 on a shaft I, hereinafter referred to. The slide E is reciprocated so as to bring the pasters between
 5 the disks G G', against which they move and take paste therefrom, and then are moved back by the slide so as to apply paste to the flaps, as hereinafter explained.

The slide E may be reciprocated (at the
 10 proper times) by any suitable means. I have shown an arm E^4 on the slide connected by a link H^6 to the upper end of a vibrating arm H^5 , attached to a rock-shaft H^4 , having a short arm H^3 , connected by a link H^2 to a wrist-pin
 15 on a crank H^1 on a sleeve H, supported upon a shaft I, driven by suitable gearing from shaft A⁴. The sleeve H is loose on the shaft I, but is adapted to be driven therefrom at the proper time by means of a friction-clutch
 20 or drive I', one member of which is fast to the sleeve and the other to the shaft. The sleeve H is locked against rotation except at the proper time by means of the lever I², pivoted on a support I³ and adapted to engage a
 25 stop-lug h on the sleeve H and hold it against rotation until the lever is momentarily disengaged therefrom at the proper time by a pivoted trip i , attached to the side piece a' of the holder A and adapted when the holder is moved
 30 in between the uprights B C to engage the inner end of lever I² and force its outer end to disengage stop h , wherefore the friction-clutch drives sleeve H around with the shaft until lug h again strikes lever I² and is arrested thereby,
 35 the construction being such (as is well known) that after sleeve H makes one revolution it is stopped and remains stopped until the holder A is again returned to the same position. On the outward movement of the holder trip i
 40 rides idly over lever I², which is returned to normal position by spring I⁴. The side a' may be grooved, as at a^3 , to prevent it interfering with lever I².

The wing-pasters $f f'$ fold the first side flap,
 45 and the opposite side flap is folded by the following means: Mounted in a guide-bracket C', attached to the upright C, is a folder-blade J, which moves horizontally and is connected by a pitman J' to the upper end of an oscillating lever J², pivoted at J³ on the rearmost
 50 bracket g' , and its lower end is engaged with a cam J⁴ on sleeve H, so formed and adjusted that folder J will be moved inward and fold the right-hand side flap of the carton with,
 55 before, or after the left-hand side flap is folded down by the pasters $f f'$. If the side flaps overlap when folded, it would be desirable to have blade J operate first and hold the side flap down until the pasters have made their
 60 traverse across the top of the carton. A spring J⁵ holds lever J² in contact with its cam and effects the retraction of folder J' at the proper time. The front flap is folded next by the following devices: A folder-blade K is
 65 mounted in a bracket K', attached to the front

board a of the holder A. A spring K² is placed in the bracket and bears against a depending lug on the blade K, so as to normally hold the same retracted. Above the blade K
 70 is a short rock-shaft k , journaled in boxes fast to board a and having on its upper and lower ends segments $k^1 k^2$. The lower segment is connected by a strap k^3 with the folder-blade K, and the upper segment k^1 is similarly connected by a strap k^4 to the end of a sliding
 75 bar L, guided in suitable keepers attached to board a and movable transversely of the holder. A spring L' is arranged to retract the bar, this spring being supplementary to spring K², both not being essential. The bar
 80 L is moved at the proper time by a finger E⁶ on slide E, which finger projects over and down at one side of the slide and has a trip E⁷ on its lower end which rides over a lug L²
 85 on bar L as slide E moves inward; but when the slide E moves outward (withdrawing the pasters) trip E⁷ engages lug L² and draws bar L back and through the described connections moves folder K inward, folding down the
 90 front (third) flap.

The bar L and finger E⁶ do not come into operative relation until after the holder has made its first step inward, and before the slide E finishes its return stroke the holder A begins its second step inward, withdrawing lug
 95 I² from finger E⁶, which can then move on outward without hindrance and will remain out of the way during the outward stroke of the holder.

Just in rear of the rearmost uprights B
 100 C is a trough M wide enough to receive the cartons, and over this trough is a presser-belt N, guided on pulleys N', suitably journaled above and at the opposite ends of the trough. At the receiving end of the trough between
 105 the rear uprights B C is a transverse bar m , preferably beveled or rounded on its inner lower edge, by which the last flap is folded, this folding taking place as and during the ejection of the carton from beneath the slide
 110 E, and this ejection is performed by the holder A, which after the side and front flaps are folded down is moved farther inward by its cam, so as to carry the carton back into
 115 the trough, and in this movement the rear (fourth) flap is folded down by its passage under bar m . As is obvious, the belt N assists in holding the flaps down when the holder A is retracted.

Operation: The operation may be recapitulated briefly, as follows: Starting with the
 120 parts in the positions shown in Fig. 1, a filled carton with its top flaps open is dropped in the holder. The latter then moves forward, pushing the carton into position between the
 125 uprights B C and stopping in the position shown in Fig. 3. Meanwhile the pasters have received paste from the disks G G', and as soon as the holder stops slide E moves inward, carrying the pasters. The disk pasters F F' ap-
 130

ply paste along the top inner edges of the front and rear flaps and the wing-pasters $f f'$ have an encycloidal movement, such that they first apply paste to the near inner side edges of the front and rear flaps and then apply paste to the far inner side edges of the same flaps. The wing-pasters $f f'$ furthermore serve as folders to fold down the near side flap and also as openers to open up the front and rear flaps if they are not already sufficiently opened. Preferably the parts are so timed that before slide E has reached the middle of its outward stroke folder J is moved inward, turning down the far side flap, making the second fold. Then as slide E is retracted finger E^b engages bar L and moves it outward, operating blade K at the proper time to fold down the front third flap. After the pasters are out of the way and finally the holder A is moved a second step inward, so as to carry the carton beneath the bar m , whereby the fourth flap is folded, then the holder A moves back to first position ready to receive another carton and the folding operations are repeated.

I do not restrict myself to the specific constructions of parts shown and described, particularly as to the driving mechanisms, although the machine shown is the best now known to me and has been successfully and practically operated.

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

1. In a carton folding and pasting machine, a reciprocating slide, a pair of gyratory wings attached to said slide, and adapted to fold one end flap of the carton and apply paste to the front and rear flaps, substantially as described.

2. In a carton folding and pasting machine, a reciprocating slide, means for presenting a carton thereunder, a pair of gyratory wing-pasters attached to said slide, and means for moving said wing-pasters as the slide reciprocates, and a pair of disk pasters attached to the slide adapted to apply paste to the top edges of the front and rear flaps, substantially as described.

3. In a carton folding and pasting machine, a reciprocating slide, a pair of gyratory wing-pasters attached to said slide, and adapted to fold one end flap of the carton and apply paste to the front and rear flaps, and a pair of disk pasters attached to the slide adapted to apply paste to the edges of the front and rear flaps, substantially as described.

4. In a carton folding and pasting machine, the combination of a slide carrying pasting and folding mechanism, with a reciprocating carton-holder adapted to present a carton to such mechanism, a folding-blade on said holder, and means for operating said folding-blade from and by the movement of the slide.

5. In a carton-folding machine, the combi-

nation of opposite folding devices, a reciprocating carton-holder, means for moving said holder to first present the carton to the action of said folding devices, and then to eject the carton therefrom after the flaps are folded.

6. In a carton folding and pasting machine, the combination of opposed folding devices, a pasting mechanism coacting therewith, a reciprocating carton-holder, a folding-blade carried thereby, means for moving said holder so as to present the carton to the action of pasting and folding mechanisms, and for further moving said holder to eject the folded carton, and means for actuating the folding-blade on the holder at the proper time, substantially as described.

7. In a carton-folding machine, the combination of a reciprocating carton-holder, opposite folding devices, means for moving said holder to first present the carton to the action of said folding devices, and then eject it therefrom after the flaps are folded a folding-blade carried by said holder, and means for operating said latter folding-blade when the holder is in position between the folding devices.

8. In a carton-folding machine the combination of folding and pasting devices, a continuously-rotating shaft, means operated by said shaft for actuating said folding and pasting devices, mechanism for locking said means after each cycle of folding and pasting operation, and means for tripping said locking mechanism when a carton comes into position for folding and pasting.

9. In a carton-folding machine, the combination of folding mechanism, a continuously-driven shaft, a sleeve thereon and driven therefrom, means operated by said sleeve for actuating the folding mechanism at the proper time, devices for locking said sleeve after each cycle of folding operations is completed, and means for tripping said locking device when a carton comes into position for folding, substantially as described.

10. In a carton-folding machine, the combination of pasting and folding mechanism, a continuously-driven shaft, a frictionally-driven sleeve thereon, means operated by said sleeve for actuating the folding and pasting mechanism at the proper time, devices for locking said sleeve after each cycle of folding and pasting operation is completed, and means for tripping said locking device when a carton comes into position for folding, substantially as described.

11. In a carton-folding machine, the combination of a reciprocating slide, pasting devices carried by said slide, folding devices, a continuously-driven shaft, means operated by said shaft for actuating said pasting and folding devices, means for locking said operative means after each cycle of folding operations, and means for tripping said locking device when a carton comes in position for folding.

12. In a carton-folding machine, the combination of a reciprocating slide, pasting devices carried by said slide, and an opposite folding-blade, with a continuously-driven shaft, means operated by said shaft actuating said pasting and folding devices, means for locking said operative means after each cycle of folding operations, and means for tripping said locking devices when a carton comes in position for folding.

13. In a carton-folding machine, the combination of a movable carton-holder, adapted to present the carton to pasting devices, and subsequently discharge the same therefrom; with a folding-blade attached to said holder, a reciprocating slide actuating the pasting devices, and means whereby said slide actuates the folding-blade on the holder after the pasting operation, substantially as described.

14. In a carton-folding machine, the combination of the movable carton-holder, the folding-blade thereon, the rock-shaft and connections for operating said blade in one direction, mechanism adapted to actuate said shaft when the holder has moved the carton to folding position, substantially as described.

15. In a carton-folding machine, the combination of folding devices, a driven shaft, a means operated by said shaft for actuating said folding devices at the proper time, and devices for locking said means after each cycle of folding operations is completed, with a carton-holder adapted to present cartons to said folding devices, and means operated by said holder for tripping the said locking devices, substantially as described.

16. In a carton-folding machine, the combination of a movable carton-holder, adapted to present the carton to pasting and folding devices, and subsequently discharge the same therefrom, with a folding-blade attached to said holder, a reciprocating slide carrying pasting and folding devices, and means whereby said slide actuates the folding-blade on the holder after the pasting operation, substantially as described.

17. In a carton-folding machine, the combination of a movable carton-holder, the folding-blade thereon, a rock-shaft and connections for operating said blade in one direction, and a spring for retracting the blade, with mechanism independent of the holder adapted to actuate said shaft when the holder has moved the carton to folding position, substantially as described.

18. In a carton-folding machine, the combination of a reciprocating slide, pasting and folding devices carried by said slide, an opposite folding-blade, a driven shaft, a frictionally-driven sleeve, and means operated by said sleeve for actuating said pasting and folding devices at the proper time, means for locking said sleeve after each cycle of folding and pasting operations is completed; a car-

ton-holder adapted to present cartons to said folding devices, and means operated by said holder for tripping the said locking devices, substantially as described.

19. In combination a carton-holder, a folding-blade, a sliding bar, a vertical rock-shaft, connections between the opposite ends of said rock-shaft and said bar and blade, and means for moving said bar so as to actuate the blade when the carton is in folding position, substantially as described.

20. The combination of the carton-holder, a folding-blade mounted thereon, a spring for retracting said blade, a sliding bar, a vertical rock-shaft, connections between the opposite ends of said rock-shaft and said bar and blade, said connections comprising segments and straps, and means for moving said bar so as to actuate the blade when the carton is in folding position, substantially as described.

21. In a carton-folding machine, the combination of a reciprocating slide, folders attached to said slide, an opposite folding-blade, a continuously-driven shaft, a sleeve thereon driven thereby, mechanism actuated by said sleeve for operating the said slide and folder at the proper times, and a locking device for arresting the said sleeve after it has made one rotation; with a reciprocating carton-holder, adapted to present cartons to said folding mechanisms, and a trip on said holder adapted to release the locking device when the holder presents the carton in position for folding, substantially as described.

22. In a carton-folding machine the combination of a reciprocating slide, disk and wing pasters attached to said slide, adapted to apply paste to the top and side edges of the front and rear flaps of a carton and to fold one side flap; a folding-blade opposite the said pasting mechanism, a continuously-driven shaft, a sleeve thereon driven thereby, mechanism actuated by said sleeve for operating the said slide and folder at the proper times, and a locking device for arresting the said sleeve after it has made one rotation; with a reciprocating carton-holder, adapted to present cartons to said pasting and folding mechanisms, and a trip on said holder adapted to release the locking device when the holder presents the carton in position for folding, substantially as described.

23. In a carton-folding machine, the combination of a reciprocating slide, folders attached to said slide, an opposite folding-blade, a continuously-driven shaft, a sleeve thereon driven thereby, mechanism actuated by said sleeve for operating the said slide and folder at the proper times, and a locking device for arresting the said sleeve after it has made one rotation; with a reciprocating carton-holder, adapted to present cartons to said folding mechanisms, and a trip on said holder adapted to release the locking device when the holder pre-

sents the carton in position for folding, a folding-blade on said holder, means for operating said blade from and by the movement of the slide, a receiver into which the carton is discharged by the holder, and a fixed bar by which the last flap is folded as the carton enters the receivers, substantially as described.

24. In a carton-folding machine, the combination of a reciprocating slide, disk and wing pasters attached to said slide, adapted to apply paste to the top and side edges of the front and rear flaps of a carton and to fold one side flap; a folding-blade opposite the said pasting mechanism, a continuously-driven shaft, a sleeve thereon driven thereby, mechanism actuated by said sleeve for operating the said slide and folder at the proper times, and a locking device for arresting the said sleeve after it has made one rotation; with a reciprocating carton-holder, adapted to present cartons to said pasting and folding mechanism, a trip on said holder adapted to release the locking device when the holder presents the carton in position for folding, a folding-blade on said holder, means for operating said blade from and by the movement of the slide, a receiver into which the carton is discharged by the holder, and a fixed bar by which the last

flap is folded as the carton enters the receivers, substantially as described.

25. In a carton-folding machine, the combination of a carton feeder and holder, with a reciprocating pasting and folding mechanism, comprising means for folding one flap and pasting two opposite flaps of the carton, and a folding-blade on and moving with said holder; and means to operate said folding-blade at the proper time.

26. In a carton-folding machine, the combination of mechanism for feeding and holding cartons, and flap-folding devices arranged to operate on the carton-flaps while in the holder; with a rotating shaft; means operated by said shaft for actuating said folding devices, mechanism for locking said means after the folding operation is completed; and means for tripping said locking mechanism when a carton is fed into position for folding.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOSEPH H. WEEKS.

In presence of—

JAMES R. MANSFIELD,
C. EDWARD DUFFEY.