

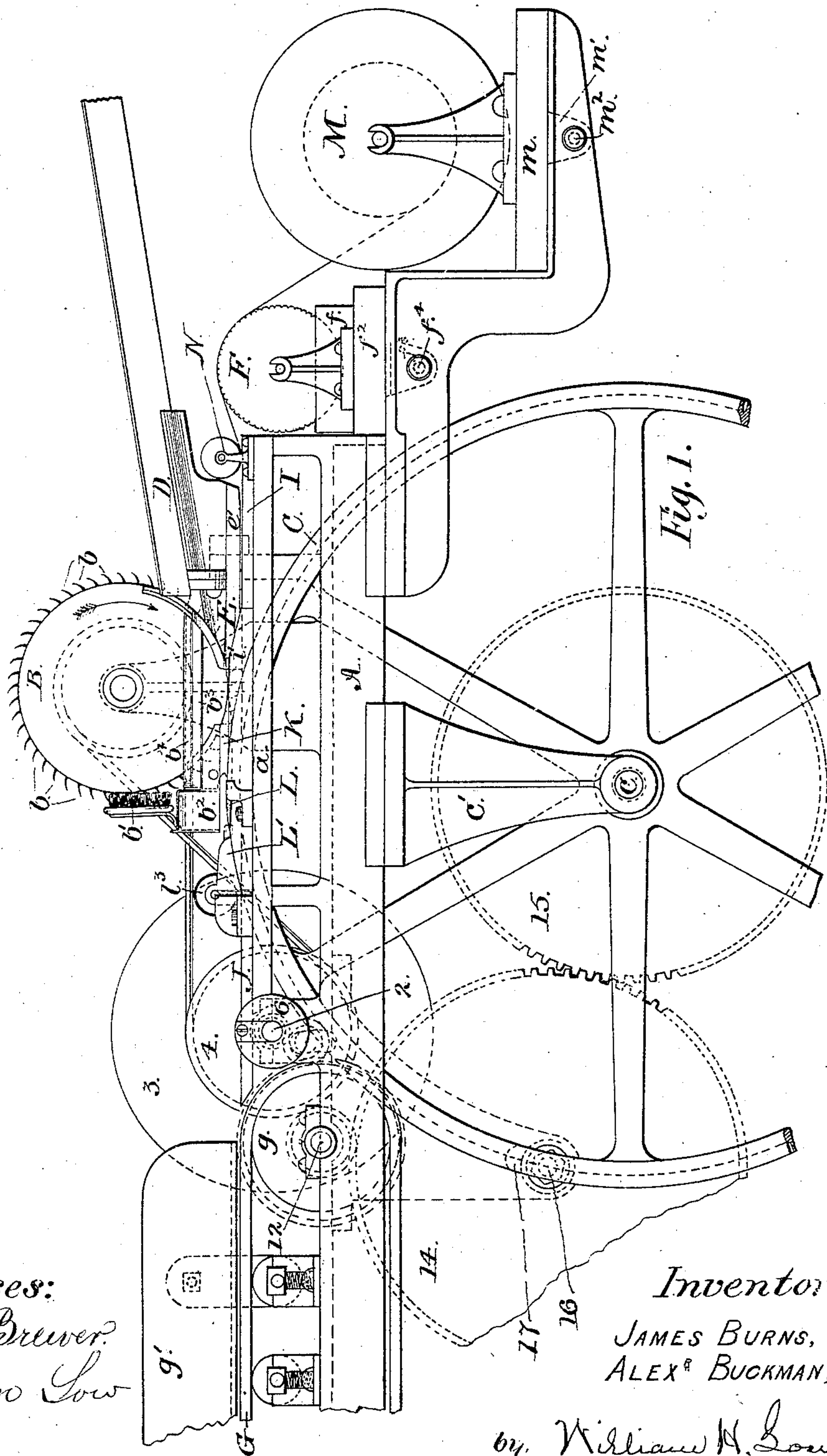
(No Model.)

4 Sheets—Sheet 1.

J. BURNS & A. BUCKMAN.
CIGARETTE MACHINE.

No. 294,113.

Patented Feb. 26, 1884.



Witnesses:

S. B. Brewer.
Addison Low

Inventors:

JAMES BURNS, and
ALEX^R BUCKMAN,

by William H. Low
Attorney.

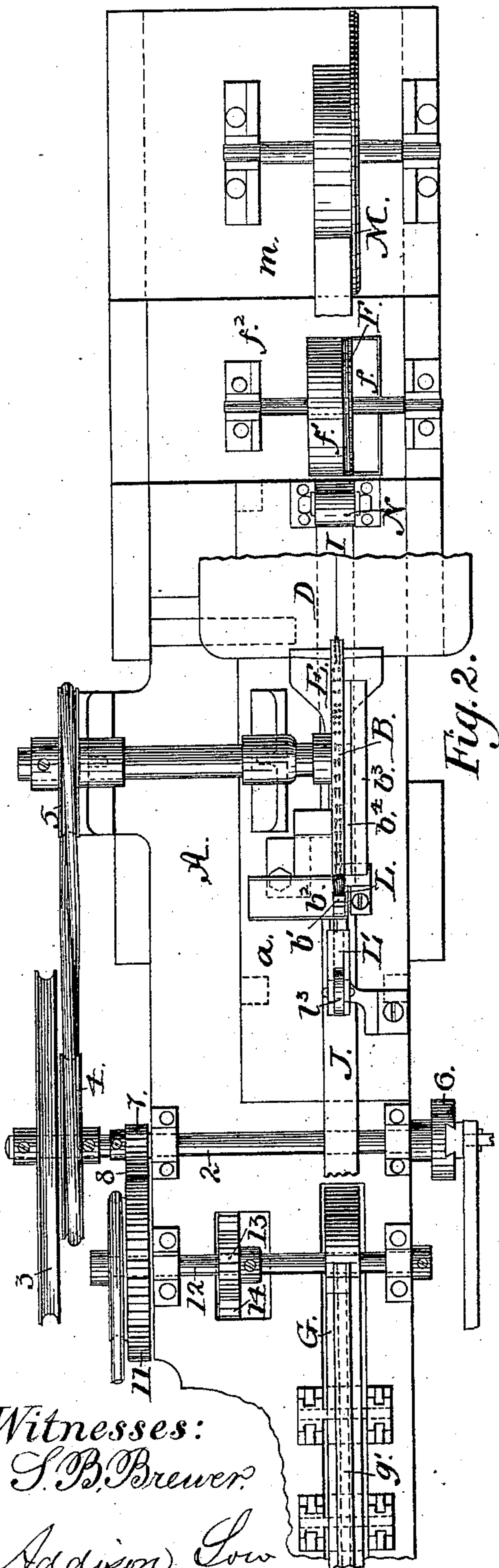
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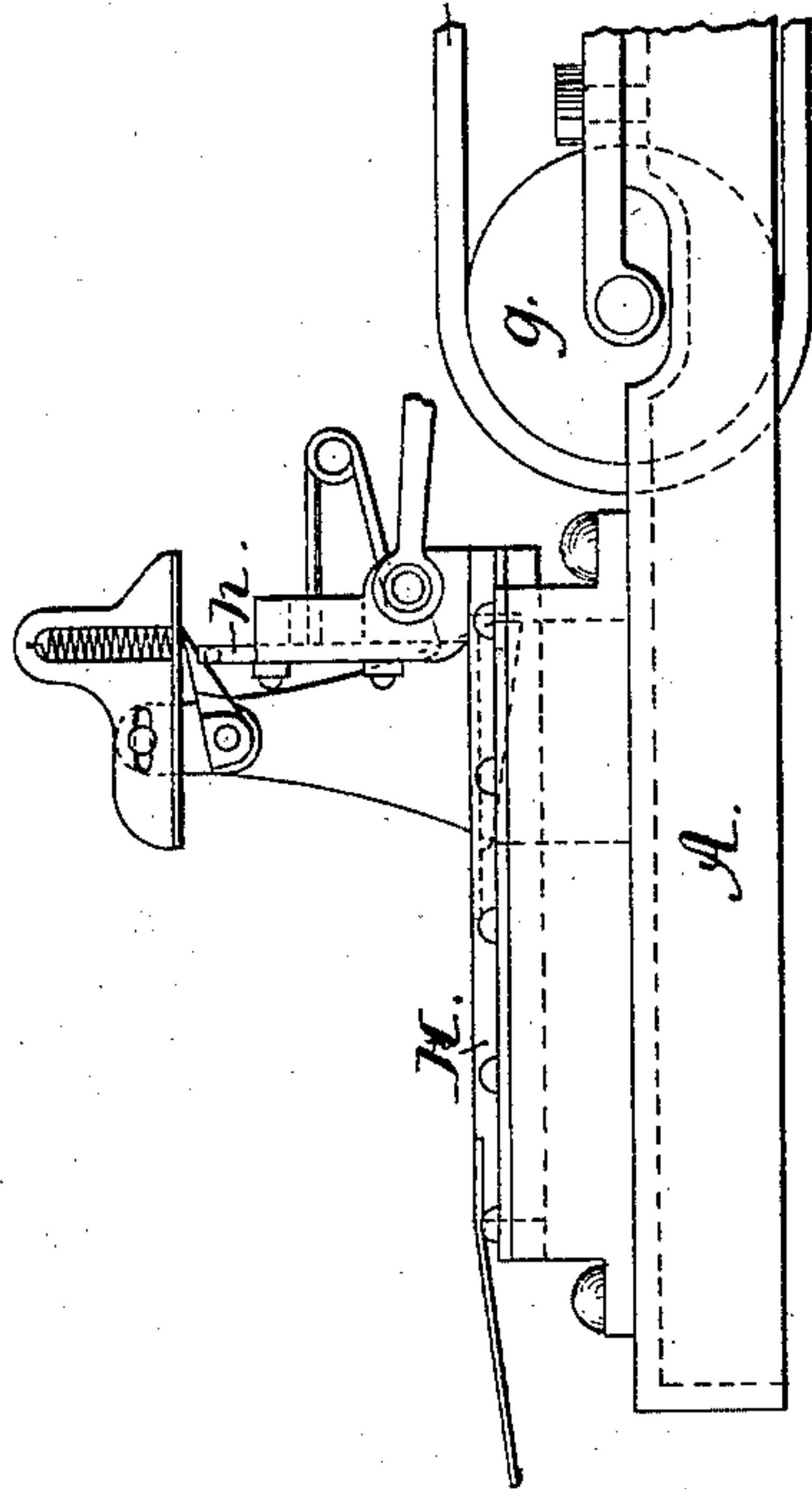


Fig. 7.

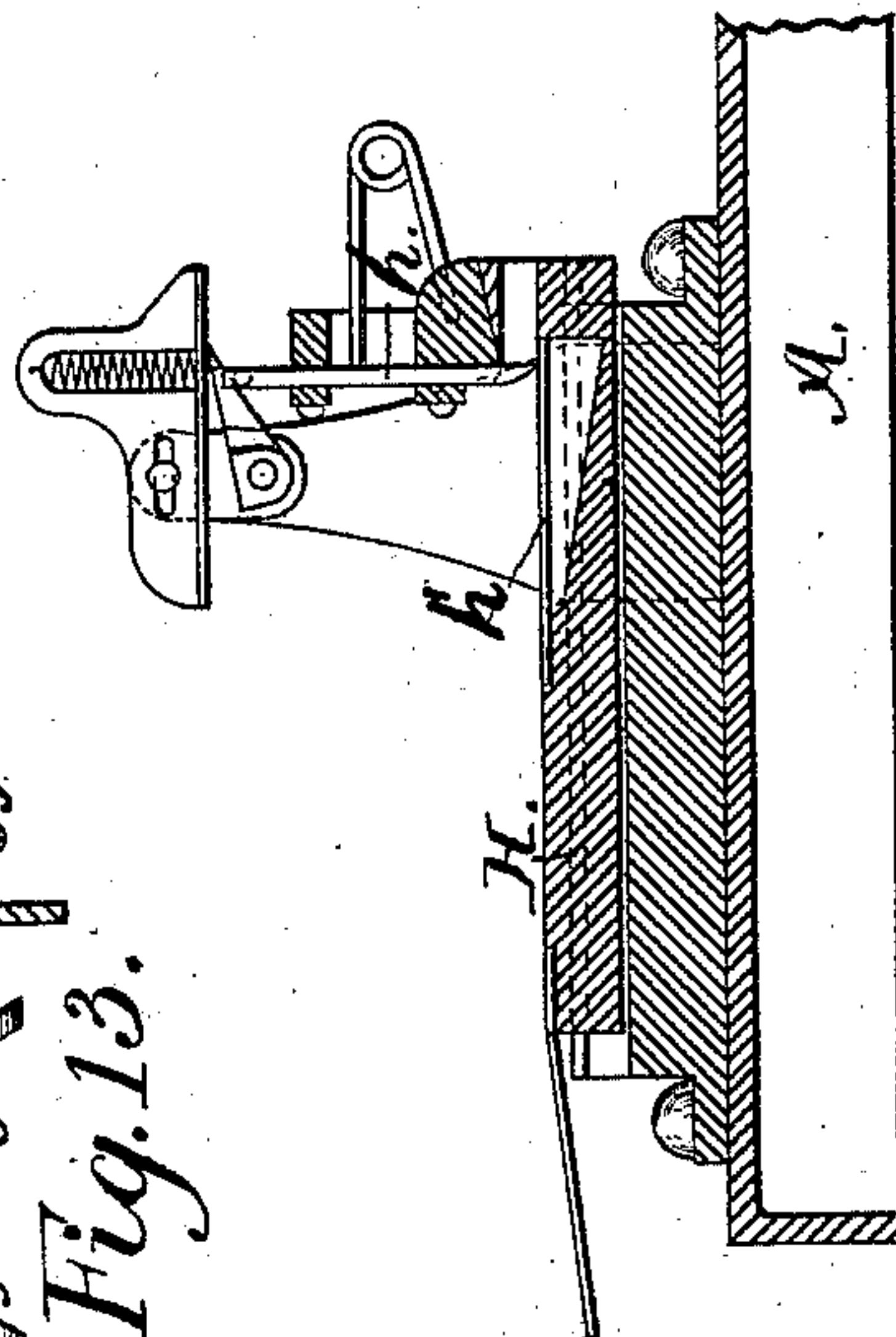


Fig. 8.

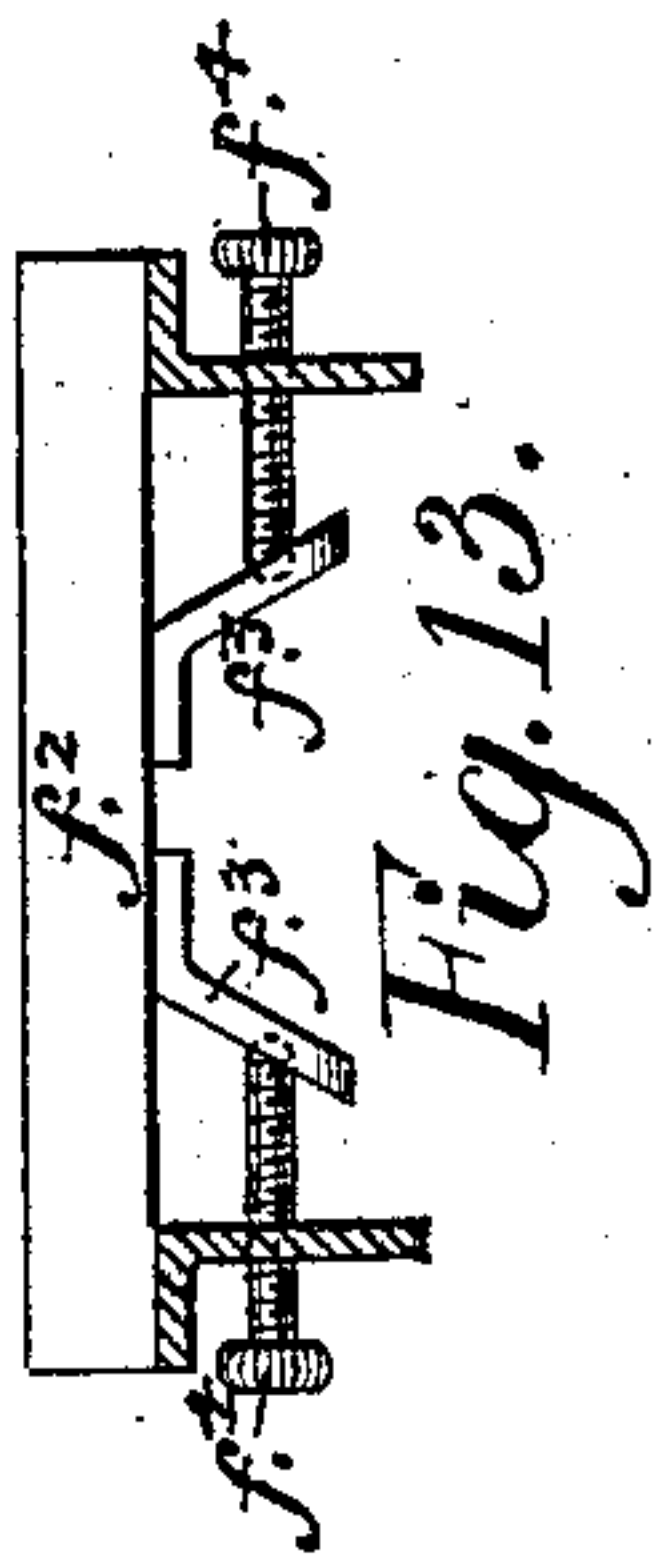


Fig. 13.

Inventors:

JAMES BURNS, ^{and}
ALEX BUCKMAN,

by William N. Low,
Attorney.

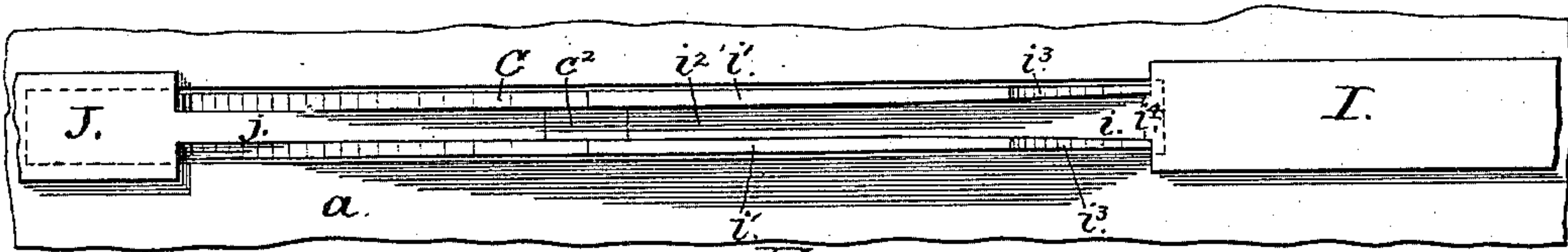
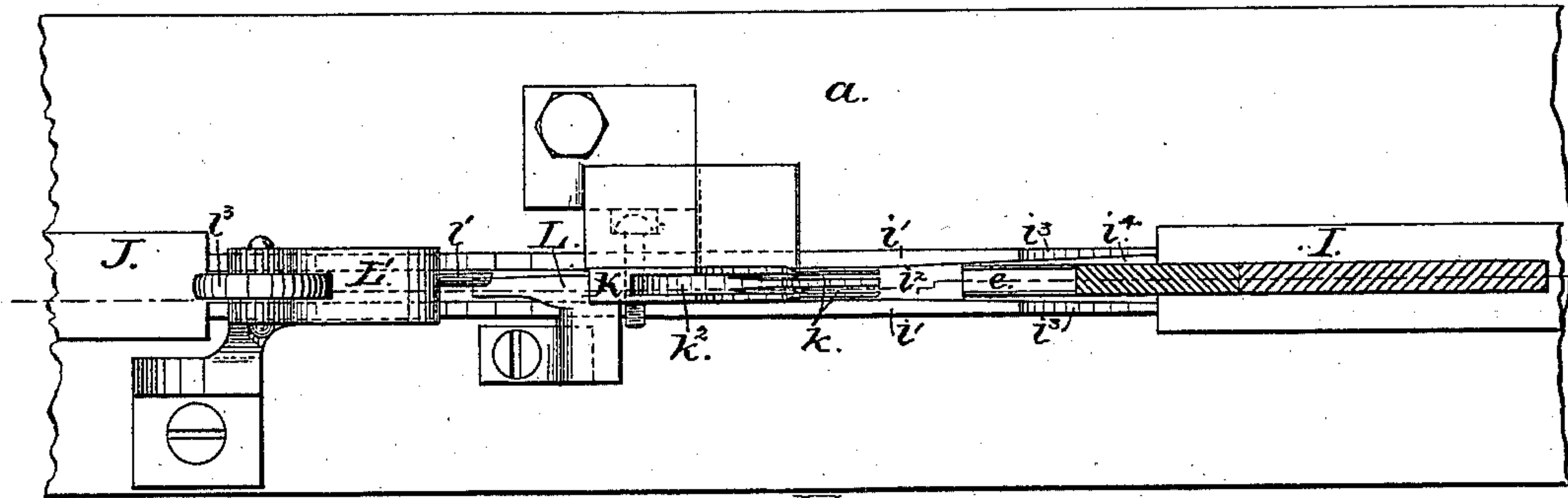
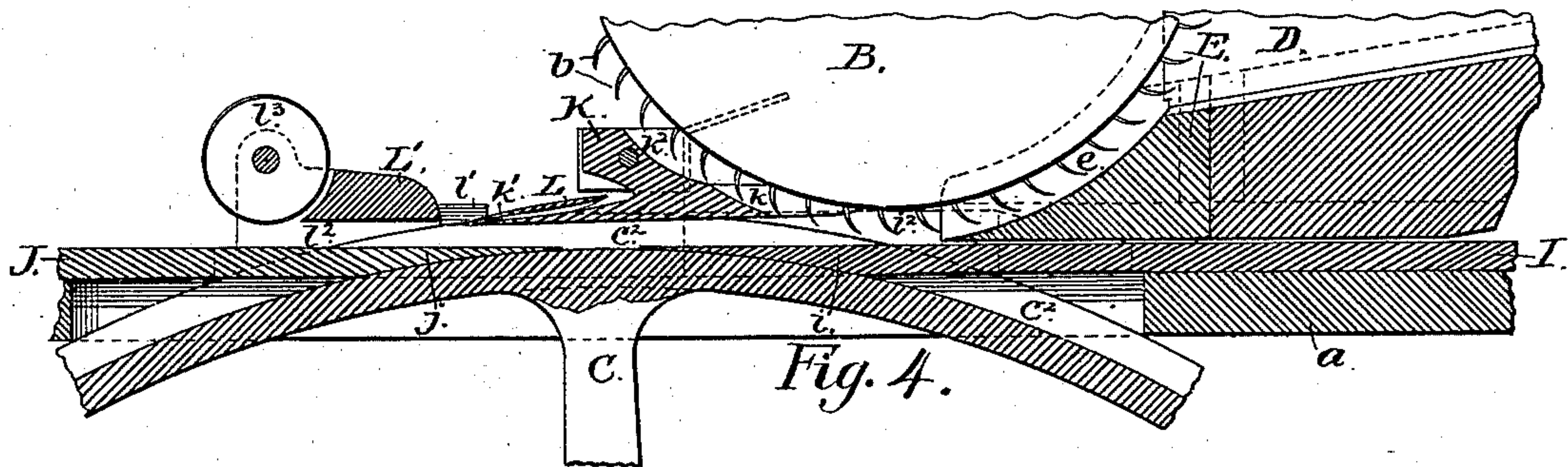
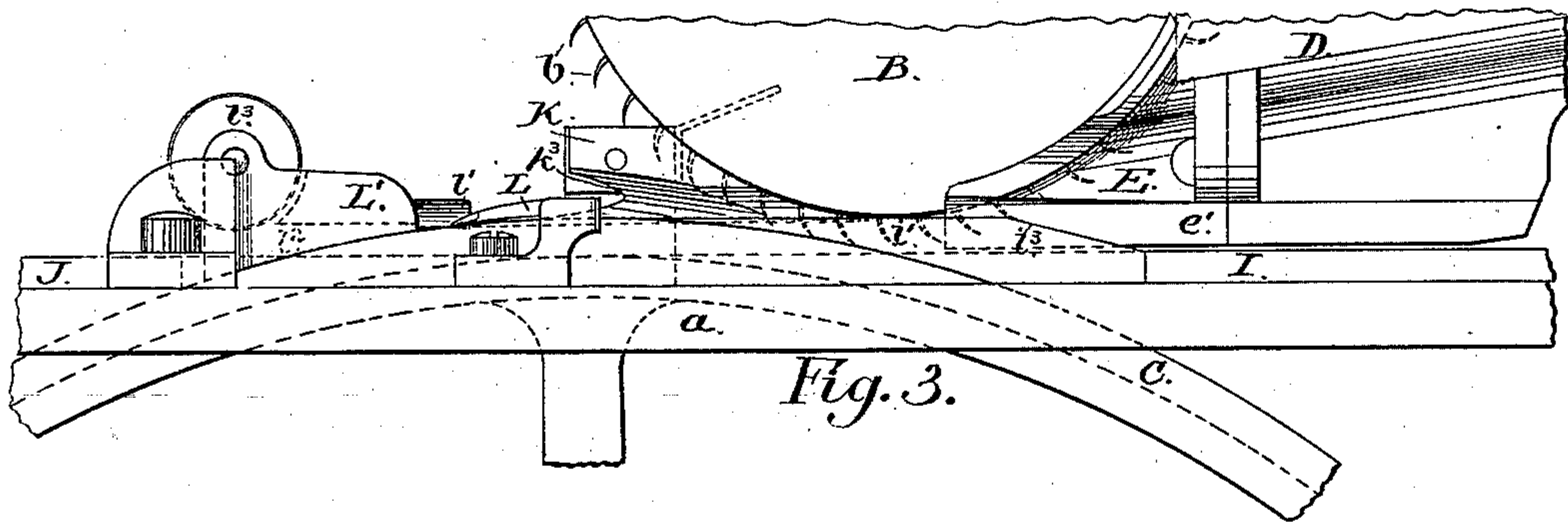
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4 Sheets—Sheet 3.

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S. B. Brewer,
Addison Low

Inventors:

JAMES BURNS, and
ALEX^r BUCKMAN,

by

William N. Low,

Attorney.

(No Model.)

4 Sheets—Sheet 4.

J. BURNS & A. BUCKMAN.
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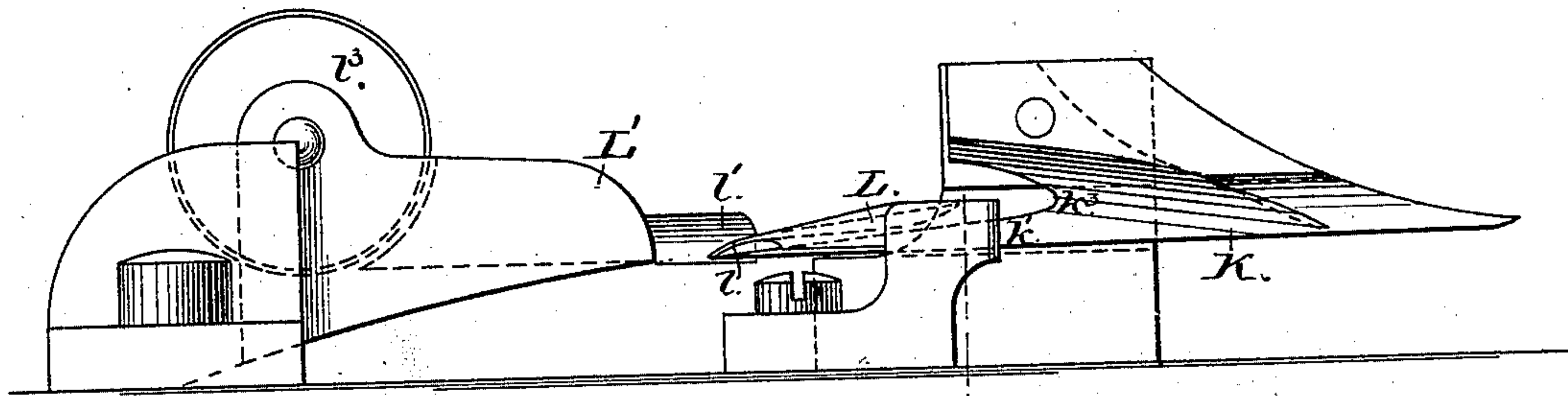


Fig. 9.

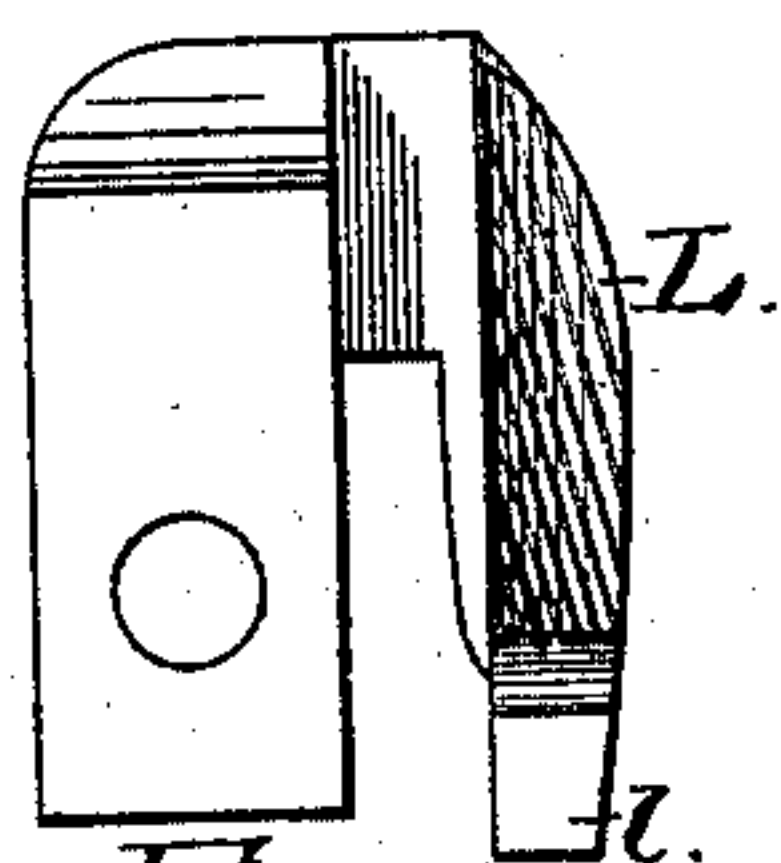


Fig. 12.

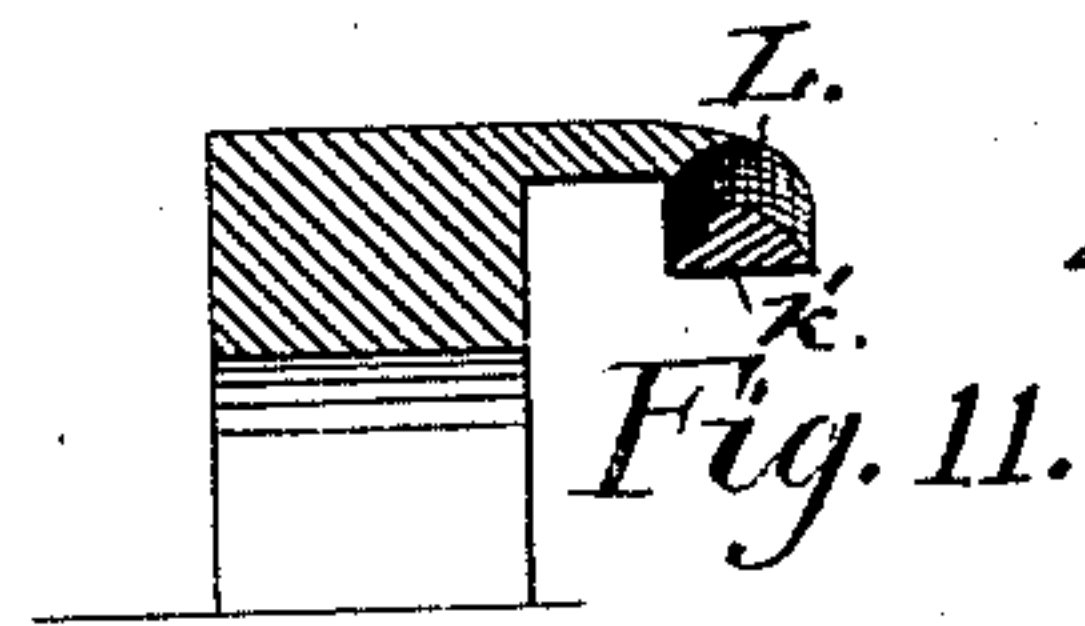


Fig. 11.

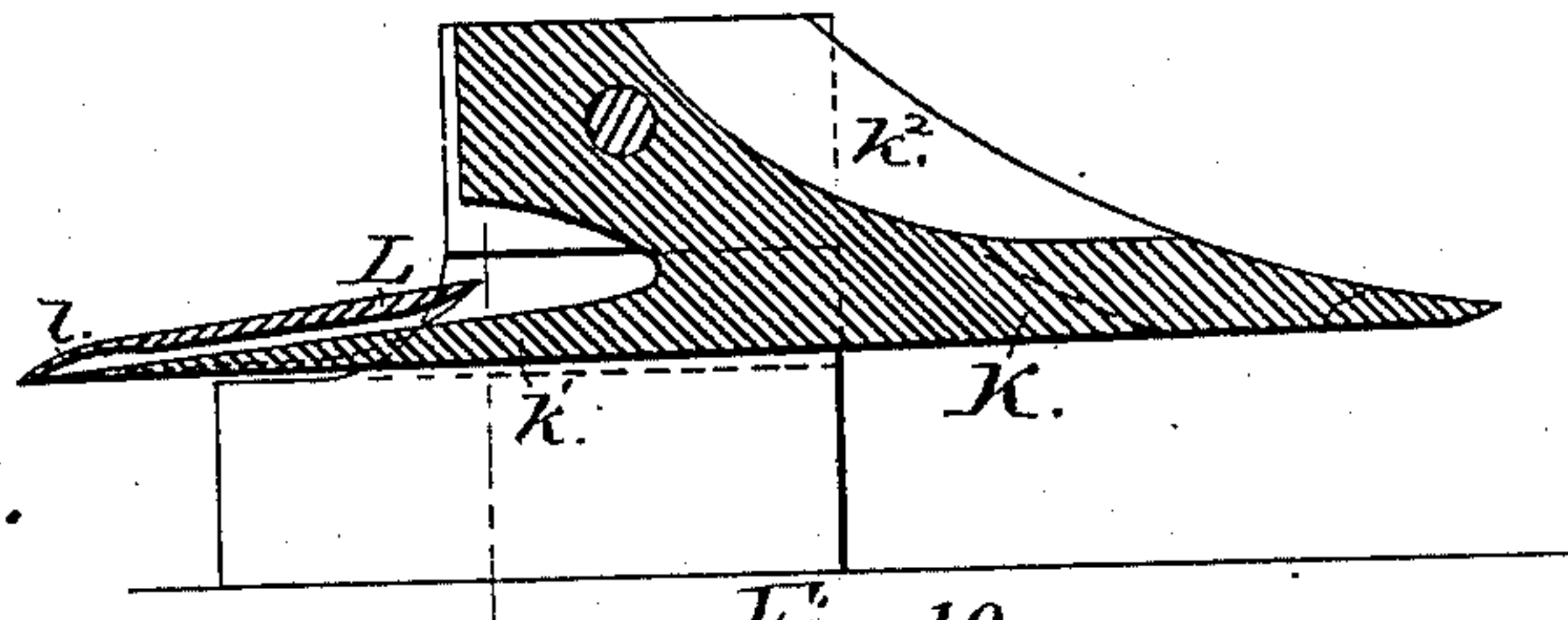


Fig. 10.

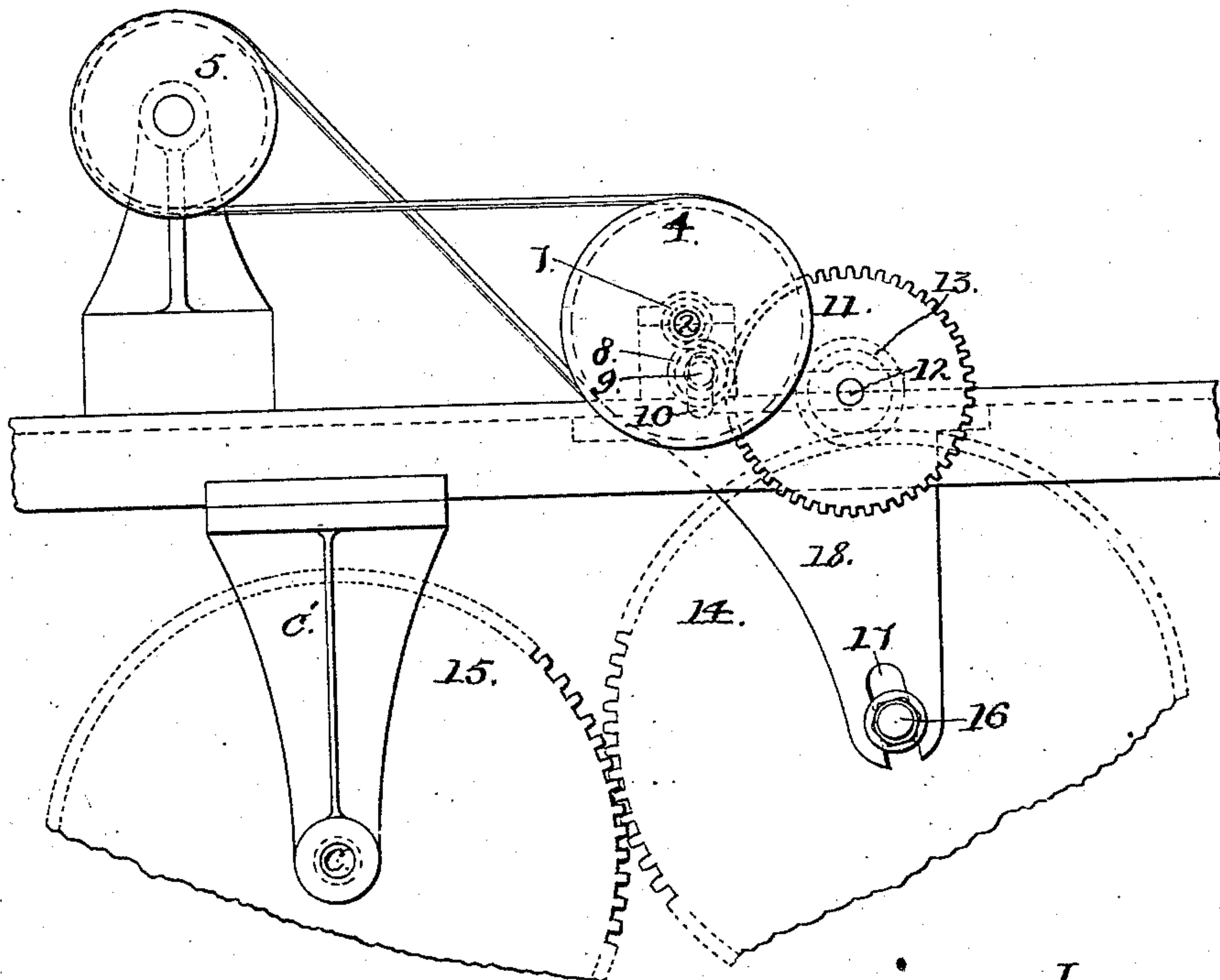


Fig. 14.

Witnesses:
S. B. Brewer,
Addison Low

Inventors:
JAMES BURNS, and
ALEX^r BUCKMAN,

by William H. Low,
Attorney.

UNITED STATES PATENT OFFICE.

JAMES BURNS, OF BROOKLYN, AND ALEXANDER BUCKMAN, OF SCHODACK DEPOT, NEW YORK, ASSIGNORS OF TWENTY-TWO FORTIETHS TO ABRAM L. SCHERMERHORN AND JOHN S. BAKER, BOTH OF STUYVESANT, AND JAMES R. DOWNER AND FRANK P. HARDER, BOTH OF CASTLETON, NEW YORK.

CIGARETTE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 294,113, dated February 26, 1884.

Application filed January 23, 1883. (No model.)

To all whom it may concern:

Be it known that we, JAMES BURNS, of Brooklyn, in the county of Kings and State of New York, and ALEXANDER BUCKMAN, of Schodack Depot, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Cigarette-Machines, of which the following is a specification.

Our invention relates to improvements on the cigarette-machine for which Letters Patent No. 259,090 of the United States were granted to us on the 6th day of June, 1882; and the object of our present improvements is to remedy certain defects in the operation of the machine above referred to, and to adapt it to operate so that rice-paper and other tender and fragile wrapping materials may be used for the wrapping of the cigarettes made by it, the said wrapping materials being, by reason of their inherent weaknesses, unable to withstand the strain necessarily exerted by the feeding mechanism employed in our earlier machine, and the use of that class of wrapping materials being considered essential to the production of the best class of goods renders our present improvements a necessity.

A further object of our improvements is to effect, by means of a retrorse arrangement of the pins in the periphery of the tobacco-feeding wheel, a more thorough compaction of the tobacco in the cigarette-stock, and a more perfect removal of the particles of tobacco from said pins.

In the accompanying drawings, which form part of this specification, and to which reference is made herein, Figure 1 is a side elevation of the rear part of our improved cigarette-machine; Fig. 2, a plan view of same; Fig. 3, an enlarged side view of portions of the tobacco-feeding wheel, feeding-table, tongue-pieces, and grooved wheel, and the combined stripping and compressing device, and folding mechanisms; Fig. 4, a longitudinal section of Fig. 3; Fig. 5, a plan view of Fig. 3, with the tobacco-feeding wheel removed for the purpose of exposing underlying parts; Fig. 6, a like view, showing the arrangement

of the tongue-pieces in relation to the upper part of the grooved wheel; Fig. 7, a detached side view of the cutting-off mechanism; Fig. 8, a longitudinal section of same; Fig. 9, an enlarged side view of the combined stripping and compressing device and the folding mechanisms; Fig. 10, a longitudinal section of same, showing the relative arrangement of the compressing device and first folder; Fig. 11, a transverse section on the line X on Fig. 9, viewed in the direction indicated by the arrow marked thereon; Fig. 12, an inverted plan view of the first folder; Fig. 13, a detached detail, showing our improved arrangement for adjusting and securing the bed containing the pasting device; and Fig. 14, a rear elevation of the arrangement of pulleys and gearing for imparting the requisite motions to the several parts of the machine.

As represented in the drawings, A designates the bed-piece of the machine, which is provided with a raised plate or platform, *a*, whereto the several parts of the wrapper-folding mechanisms are attached; B, the tobacco-feeding wheel; C, a large grooved wheel for maintaining the wrapper in a proper trough-shaped form during the operation of filling and for feeding forward the cigarette-stock to the folding and finishing mechanisms; D, the feeding-table; E, the feeding channel-piece; F, the pasting device; G, an endless belt, which serves as an auxiliary feeding mechanism for the cigarette-stock, and H the reciprocating head for the cutting-off mechanism.

The bed-piece A may be made in the form shown or in any other suitable form. A platform, *a*, is secured to said bed-piece and arranged at a proper height therefrom to suit the requirements of the several parts secured to said platform, as hereinafter explained.

The grooved wheel C is secured to a shaft, *c*, which is adapted to rotate in hangers *c'*, secured to the under side of the bed-piece A. The said wheel is provided with a peripheral groove, *c''*, whose width coincides with the diameter of the continuous cigarette-stock to be formed therein. The upper part of said wheel is projected through the upper face of the plat-

form a , so as to bring the bottom of the groove c^2 on a true line with the upper faces of the tongue-pieces I and J, which are secured upon the upper face of the platform a at opposite sides of the axial center-line of the wheel C. Said tongue-pieces are respectively provided with tongues i and j , which are fitted into the groove c^2 , so as to form at the upper side of the wheel C tangents to the bottom of the said groove, and produce substantially a straight continuous surface with the bottom of the groove c^2 .

The tongue-piece I, which is fixed behind the center line of the wheel C, is provided at each edge with cheeks i' , which correspond in height and thickness to the standing flanges which form the sides of the groove c^2 in said wheel. The said cheeks are fitted to the curvature of the periphery of the wheel C, and they form, behind the line of the axial center of said wheel, a short stationary groove, i^2 , which corresponds in size and position to the groove c^2 in said wheel. At their rear ends the upper edges of the cheeks i' have an upward inclination, as at i^3 , and the lateral space between them is increased at the same point, as shown in Fig. 6, for the purpose of forming an outwardly-expanding throat, i^4 . The upward and lateral inclinations thus given to the cheeks i' give to the strip of wrapping material its initial bends, so as to form a trough of said wrapper preparatory to its receiving its filling of tobacco.

The tongue-piece J is fixed in front of the line of the axial center of the wheel C, and is made and fitted to said wheel in the manner described for the tongue-piece I, excepting that it is unprovided with any cheeks.

The tobacco-feeding wheel B is adapted to rotate in the direction indicated by the arrow marked thereon. Said wheel is provided with two peripheral rows of projecting pins, b , which, instead of being radial, as shown in our former patent hereinbefore referred to, are curved or inclined backward in respect to the direction of the movement of said wheel, and this backward inclination is given to said pins for the purpose of obtaining a more effective action of them in pressing the tobacco into the trough form of wrapper as it lies in the groove c^2 and i^2 , and for effecting a more perfect removal of the shreds of tobacco from said pins by means of the stripping device hereinafter described. In front of the wheel B a brush, b' , is arranged to bear against the periphery of said wheel, so as to remove therefrom and from the pins b all shreds and particles of tobacco adhering thereto, which (shreds and particles) will then drop into the receptacle b^2 , from whence they can be readily removed. An outwardly-inclined guard-plate, b^3 , is provided with an elastic edge of rubber, b^4 , which bears against the outer face of the feeding-wheel B, to deflect and prevent all dust or dirt from falling upon the pasted edge of the wrapper.

The wrapper, cut in a continuous strip of a

width suited to the required size of the cigarette, is rolled upon a reel, M, which rotates in standards fixed upon a movable bed, m , at the rearmost end of the machine. The bed m is provided on its under side with outwardly-flaring angle-pieces m' , against which the two oppositely-located adjusting-screws m^2 are adapted to bear in such manner that they will adjust the said bed and its attached reel M sidewise, and at the same time secure them in place on the machine.

The pasting device consists of a pasting-disk, F, which, for the purpose of applying the paste in closely-adjacent spots, we preferably make with a serrated edge. Said disk is revolved by means of the moving strip of wrapping material in a trough, f , containing paste or other suitable adhesive material. A roller, f' , of the same diameter as the pasting-disk, is secured to the same spindle, but is placed outside of the trough f , and affords the required support to the unpasted edge of the strip of wrapping material as the latter is fed forward over the pasting device. The said pasting device is fixed upon a movable bed, f^2 , provided on its under side with divergent angle-pieces f^3 , which receive the pressure from two oppositely-located adjusting-screws, f^4 , for the double purpose of laterally adjusting the pasting device and securing it in place on the machine.

The feeding-table D forms an extension to the feeding channel-piece E. The latter is arranged at the under side of the after part of the feeding-wheel B in such manner that the periphery of said wheel will extend into the channel e of said channel-piece. Said channel e is made of sufficient depth to leave considerable clearance therein beyond the ends of the pins b of the feeding-wheel, so as to insure the certainty of an ample supply of tobacco being carried by the pins B through said channel, for effecting the proper filling of the cigarette-stock. The channel e has its bottom curved so as to maintain a uniform distance from the periphery of the feeding-wheel B, and to permit the tobacco to be moved therethrough without producing any compression of the fibers while in said channel. The lower part of the channel-piece E is provided with a tongue, e' , (through the front end of which the channel e is cut down to the lower edge of said tongue,) which is inserted into the throat i^4 of the tongue-piece I in such manner that sufficient space will be left between the bottom and sides of said tongue and the adjacent parts of the throat i^4 to permit the wrapping material to pass there-through.

Underneath the forward portion of the feeding-wheel B there is fixed a combined stripping and compressing device, K, which is fitted to conform to the periphery of said wheel, and is provided with longitudinal slots k , so formed that the pins b will pass through them; but any tobacco borne upon said pins will be stripped therefrom by the under edge of the

piece K and deposited in the trough form of wrapper lying in the groove c^2 . The under face of the stripper K is placed at a slight inclination lengthwise in respect to the bottom of the groove c^2 , as formed by the tongues i and j , and is so adjusted that the forward end of its tail k' will lie at a height from the bottom of the said groove that will correspond to the thickness of the finished cigarette-stock.

The inclination given, as above described, to the under face of the stripper K serves to still further compress the filling of tobacco contained in the trough of wrapper in the groove c^2 before the edges of said wrapper are folded over and adhered together. The upper part of the stripper K, where it comes in contact with the periphery of the wheel B, has its central part cut away to form a chamber or recess, k^2 , as shown in Fig. 10, wherein any loose dust or fine particles of tobacco that may be carried through the slots k by the pins b can fall and lie harmless. The cutting away of said central part reduces the rubbing-surface of the walls composing the slots k , so that when said walls or the pins b become gummed by the juices from the tobacco they will present less resistance to the passage of said pins through the slots k than they would if said walls were maintained through the entire depth of the stripper. The forward edge of said stripper is cut away at both sides to form a throat, k^3 , as shown in Fig. 9, for facilitating the operations of the folding mechanisms. From said throat the tail k' is graduated in depth through its longitudinal center line, but retains a uniform width of face on its under side until it terminates in a thin edge at its forward end. A folder, L, by means of which the pasted edge of the wrapper is turned over as the cigarette-stock is fed forward, overlaps the tail k' of the stripper from a point near the throat k^3 , where the space between said tail and folder is greatest, as shown in Fig. 10, until it reaches the front end of the tail k' , where the spring end l of said folder bears upon the pasted spots on the wrapper and evenly distributes said paste in a continuous line. The under side of the folder L curves over the tail k' , and is provided with diagonally-arranged corrugations or grooves, as shown in Fig. 12, for the purpose of feeding the pasted edge or flap of the wrapper inwardly over the tail k' . A second folder, L', is placed a little forward of the folder L, and is provided with a curved blade, l' , which, as the cigarette-stock is fed forward, folds over the upper or unpasted edge of the wrapper, to cover the pasted and turned-down edge, and the two edges are pressed together, first, by the crown of the groove l^2 in the folder L', and then by the rounded face of the pressing-wheel l^3 , whereby the two flaps are caused to adhere in a perfect manner to each other.

The auxiliary feeding mechanism, consisting of an endless belt, G, carried on pulleys g , and the grooved holding-bar g' is fully described in our Patent No. 259,090, hereinbe-

fore referred to, and therefore a further description of it is unnecessary.

The mechanism for cutting the cigarette-stock into the required lengths for use consists of a horizontally-reciprocating head, H, which carries a vertically-reciprocating knife, h , that is operated in substantially the same manner as a like device that is shown and described in our former patent, above referred to, the only essential difference being that a horizontal spring, h' , is fixed in the upper face of the head H directly beneath the cutting-edge of the knife h in such manner that as the knife descends to sever the cigarettes from the continuous cigarette-stock the said spring will yield under the pressure of the descending knife; but as soon as the latter moves upward the resilient power of the spring h' will force the separated cigarette up to the plane of the head H into a position where it will receive a pressure from the outcoming cigarette-stock in such manner that the severed cigarettes will be successively pushed from the head H into any proper receptacle placed at the forward end of the machine to receive them.

The driving-shaft 2, which imparts motion to all the movable parts of the machine, is provided on its farther end with a pulley, 3, for receiving a driving-belt, by which the said driving-shaft is rotated. A second pulley, 4, is also fixed on the same end of the driving-shaft, and from this latter pulley a crossed belt conveys motion through a pulley, 5, to the tobacco-feeding wheel B. On the opposite end of the driving-shaft 2 a crank-wheel, 6, is secured for the purpose of imparting motion to the reciprocating head H, in the manner described in our former Patent No. 259,090. A removable pinion, 7, is attached to the driving-shaft 2 (near its farther end) and gears into an idle pinion, 8, (shown in dotted lines in Fig. 14) which revolves on a stud, 9, that is adjustable in the curved slot 10, (also shown in dotted lines in Fig. 14.) The said idle pinion gears into the wheel 11 secured to the shaft 12 on which the first pulley g of the auxiliary feeding mechanism is also secured. Provision is made by means of the curved slot 10, whose curvature is parallel to the periphery of the wheel 11, to substitute pinions of different sizes in the place of the pinion 7, so as to vary the relative speed of the shaft 12 and its dependent parts in respect to the speed of the driving-shaft 2. A removable pinion, 13, is fixed on the shaft 12 to gear into an idle-wheel, 14, which latter gears into the wheel 15 secured to the shaft c , which carries the grooved wheel C. The wheel 14 rotates on a fixed stud, 16, which is adjustable in the curved slot 17 of the pendent bracket 18, (shown in dotted lines in Fig. 1.) The slot 17 has a curvature that is parallel to the periphery of the wheel 15, so that the wheel 14 can be raised and lowered as occasion requires, and the wheels 14 and 15 will be properly retained in gear with each other whenever such changes are made. By reason of the adjustability of

the stud 16 in the curved slot 17 pinions of different sizes may be substituted in place of pinion 13, so as to change the peripheral speed of the wheel C in respect to the speed of the endless belt G, to properly adjust the movement of them as occasion may require.

The operation of our improved machine is as follows: The roll of wrapper, cut to the required width in a continuous strip, is placed on the reel M at the rear end of the machine, as shown in Fig. 1. From thence the wrapper is carried over the pasting device in such manner that the under side of the nearest edge will bear upon the upper edge of the pasting-disk F to receive its proper application of the adherent material. From the pasting-disk the wrapper passes beneath the guide roller N, and thence into the space between the tongue e' and throat i' , wherein said wrapper receives its initial folding to form a trough for receiving its filling of tobacco. The said trough form then passes into the channel-way formed by grooves c^2 and i^2 , and as it emerges from under the tongue e' it receives its first charge of tobacco from the feeding-wheel B at a point where (as will be seen by referring to Fig. 4) the space in the groove i^2 beneath said feeding-wheel has its greatest depth. By the rotations of the feeding-wheel B its pins b are successively brought into position to engage in the loose tobacco which lies on the table D in the path of said pins, and by the latter the tobacco will be carried through the channel e and deposited in the trough of wrapper lying in the groove i^2 . The surplus depth of the channel e and the clinging nature of the tobacco-fibers both conduce to the delivery of a sufficient quantity of tobacco, in a slightly compressed condition, into the trough of wrapper lying in the groove in advance of the channel e' , and the compaction of the tobacco is augmented by the action of the pins b , whose retrorse arrangement enables them to continue to exert a packing pressure against the filling in the wrapper until the points of said pins pass entirely above the under side of the stripper K. As fast as the filling in and compacting of the tobacco into the trough of wrapper is effected, the partially-formed cigarette-stock is fed forward by the grooved wheel C, and as the said stock moves forward the pasted edge of the wrapper is turned over by the folder L, as hereinbefore described, and the upper or unpasted edge of said wrapper is turned over by means of the folder L' upon the pasted and turned-down edge, and the two parts are further pressed together and caused to adhere by means of the rounded face of the pressing-wheel l^3 . The latter operation completes the formation of the cigarette-stock, which then consists of a continuous bar, of uniform size, of compressed tobacco enveloped in a continuous wrapper. It will be observed that the two edges of the wrapper are maintained in erect positions at the opposite sides of the grooves c^2 and i^2 , so as to form an open trough of the wrapper beneath the feeding-

wheel B, while said wrapper is receiving its filling of tobacco, and it will also be observed that this trough form of the wrapper is maintained by the united action of the tongue e' , the lower part of the wheel B, and the after part of the stripper K, until said wrapper has received its filling and is brought into the folder L. As fast as the cigarette-stock is completed, it passes out from beneath the pressing-wheel l^3 onto the endless belt G, and is guided forward by the grooved holding-bar g' into the cutting-off mechanism heretofore described, whereby the cigarette-stock will be separated into the lengths required by the adjustment of the feeding mechanisms.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a cigarette-machine, a tobacco-feeding wheel whose periphery is provided with circumferential rows of pins, which are curved or bent backward in respect to the direction of the rotation of said wheel, as herein described, and a stationary channel-piece, which forms part of the tobacco-feeding table, and contains a concave groove whose bottom is parallel, or nearly so, to the periphery of the tobacco-feeding wheel, the fixed peripheral pins of said wheel being adapted to pass through the entire length of said groove, in combination with a device for stripping the tobacco from the pins and compressing it into a trough of wrapper, the said device being constructed and arranged in relation to the tobacco-feeding wheel to operate as herein specified.

2. In a cigarette-machine, a peripherally-grooved wheel, in combination with tobacco feeding and filling mechanisms, as herein described, the said grooved wheel being adapted to contain the trough of wrapper during the operation of filling, and to feed forward the cigarette-stock, as herein specified.

3. In a cigarette-machine, the combination, with a tongue-piece, of the peripherally-grooved wheel, the said tongue-piece being provided with a tongue that is tangentially fitted to the bottom of the groove of said wheel and with cheeks, as herein described, whereby a stationary groove of a width and depth that is uniform with the peripheral groove of the grooved wheel is formed beneath the tobacco-feeding mechanism, as and for the purpose herein specified.

4. In a cigarette-machine, the combination, with a tobacco-feeding wheel provided with peripheral rows of immovable pins, as herein described, of a stationary channel-piece adapted to convey the tobacco directly into an open trough form of wrapper lying directly under the center of said feeding-wheel, the said channel-piece being adjunctive to the feeding-table, and provided with a channel or groove whose bottom has a curvature that is parallel or nearly parallel to the periphery of the tobacco-feeding wheel, the peripheral pins of the latter being adapted to pass through the entire

length of said groove in such manner that the ends of the pins will not reach to the bottom of said groove, as and for the purposes specified.

5 In a cigarette-machine, the combination, with a rotative wheel containing a peripheral groove, as herein shown and described, of one or more tongue-pieces provided with tongues which are arranged tangentially to the bottom of said groove, one of said tongue-pieces being provided with a straight groove that conforms to the size and produces an unbroken continuation of the groove in the rotative wheel, as and for the purpose herein specified.

15 6. In a cigarette-machine, the combination, with a tobacco-feeding wheel, of a dust-guard adapted to bear against the side of said feeding-wheel, so as to protect the pasted edge of the wrapper, as herein specified.

20 7. In a cigarette-machine, the folder L, having a spring terminal, l , and being provided on its under face with diagonal corrugations or grooves, as and for the purpose herein specified.

25 8. In a cigarette-machine, the combination, with a tobacco-feeding wheel, B, provided with retrorsely-arranged pins b , a stationary channel-piece, E, provided with concave channel e , and tongue e' , and a tongue-piece, I, provided with cheeks i' , having upwardly-inclined edges i^3 , and expanding throat i^4 , of the grooved wheel C, and stripping and compressing device K, all substantially as set forth.

9. The folder L' , provided with curved blade l' , groove l^2 , and the pressing-wheel l^3 , arranged in relation to the groove l^2 , and to operate as 35 herein specified.

10. In a cigarette-machine, the combination of the horizontally-reciprocating head H, vertically-reciprocating knife h , and the horizontal spring h' , arranged in relation to the cutting-edge of said knife, the said spring being adapted to receive the severed cigarettes and elevate them to the plane of the outcoming cigarette-stock, as and for the purpose herein specified. 40

11. In a cigarette-machine, the combination of a tobacco-feeding mechanism, a stationary feeding channel-piece, a combined wrapper-trough holding and cigarette-stock feeding device, composed of a stationary grooved 50 tongue-piece, and a peripherally-grooved rotative wheel arranged to form an unbroken straight groove, as herein described, a combined stripping and compressing device, and a wrapper-folding mechanism, all substantially 55 as herein set forth.

JAMES BURNS.

ALEXANDER BUCKMAN.

Witnesses:

WILLIAM H. LOW,
SAML. B. BREWER.