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W. S. JARBOE.

MACHINE FOR WRAPPING PACKAGES.

No. 367,637. Patented Aug. 2, 1887.

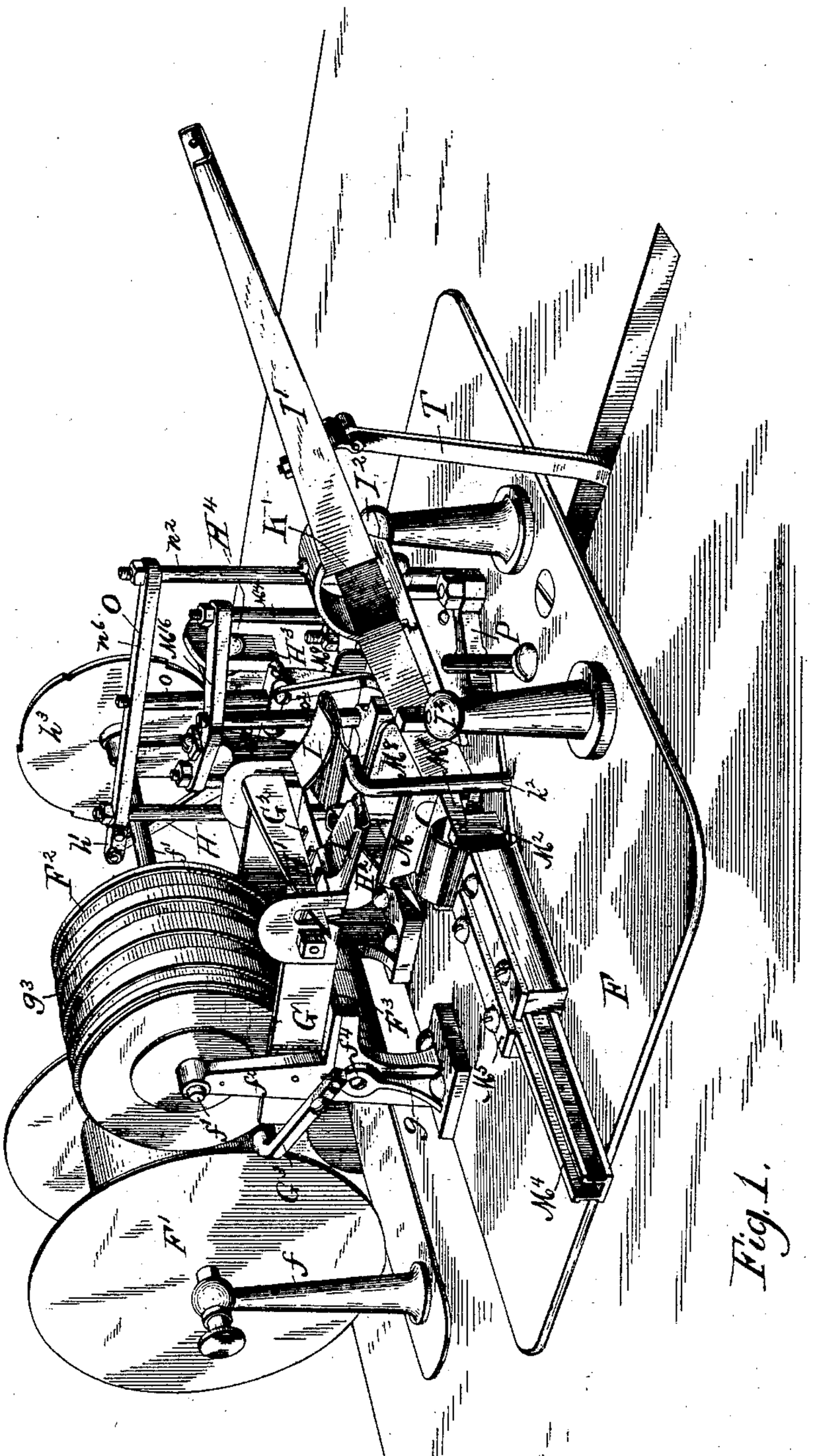

Fig. 1.

ATTEST-
J. Henry Kaiser
J. B. McGirr.

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Attys.

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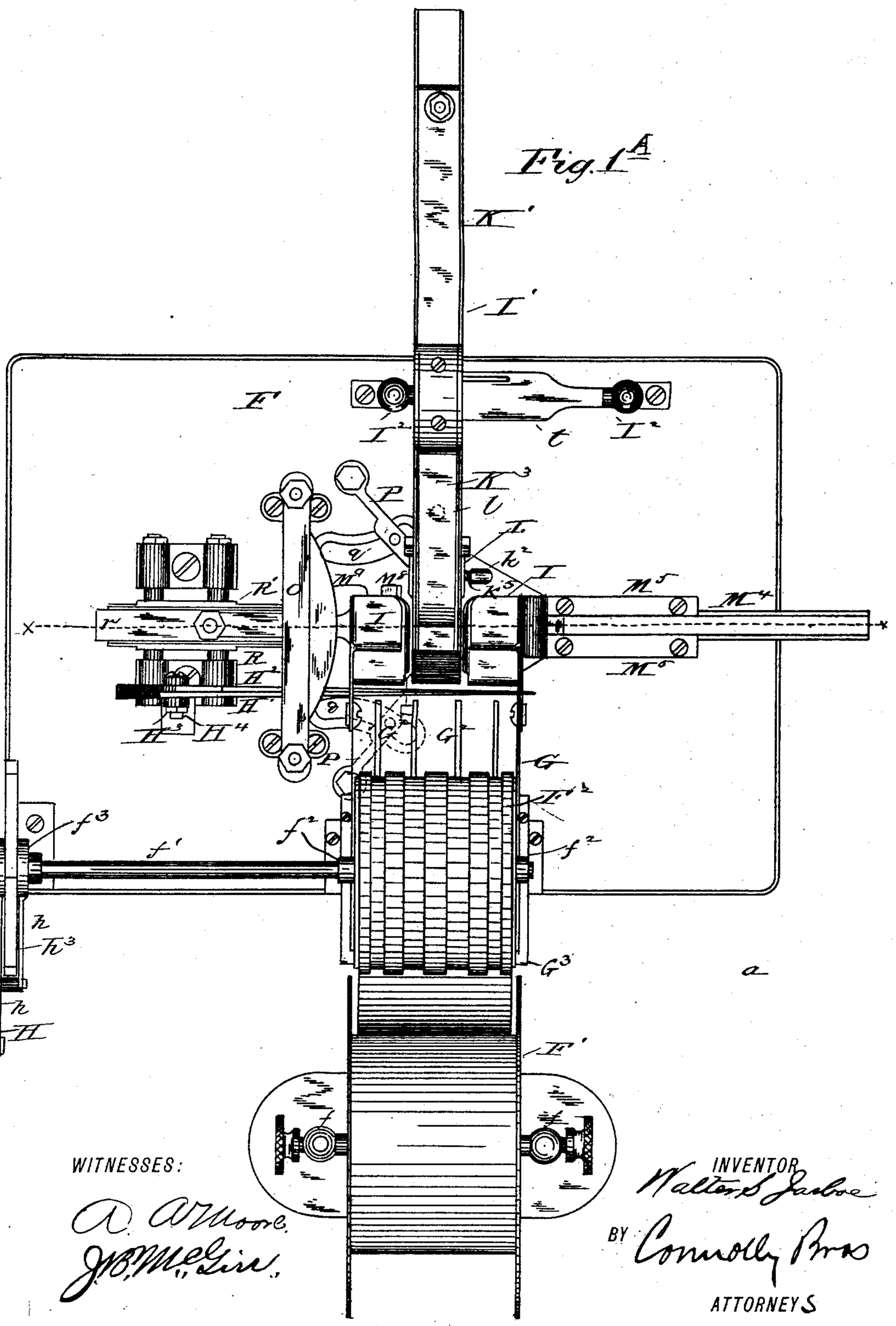

WITNESSES:

D. A. Moore.

J. B. McGinn.

INVENTOR

Walter S. Jarboe

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W. S. JARBOE.

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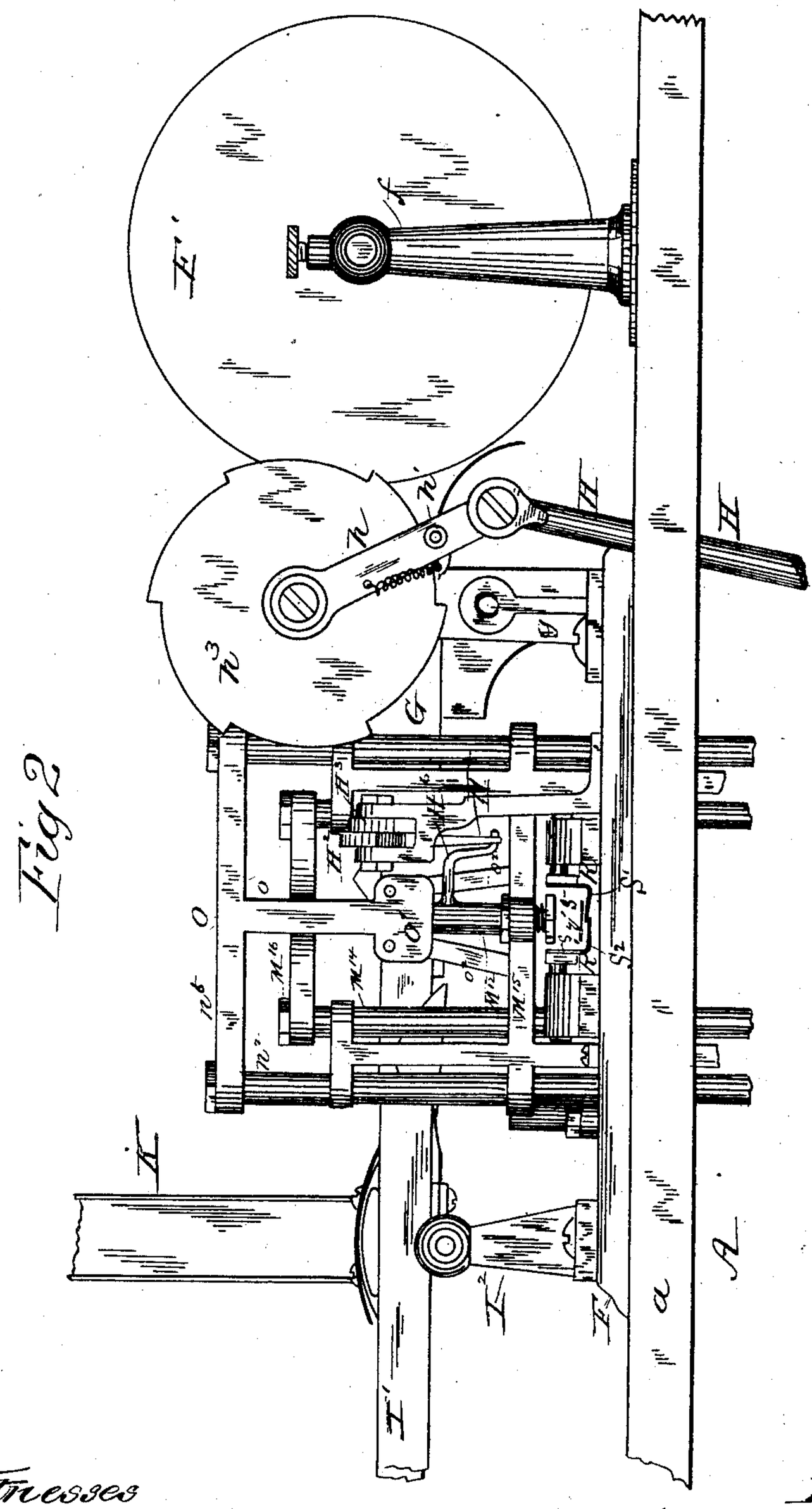

Fig 2

Witnesses
J. B. McGinn.
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attorneys

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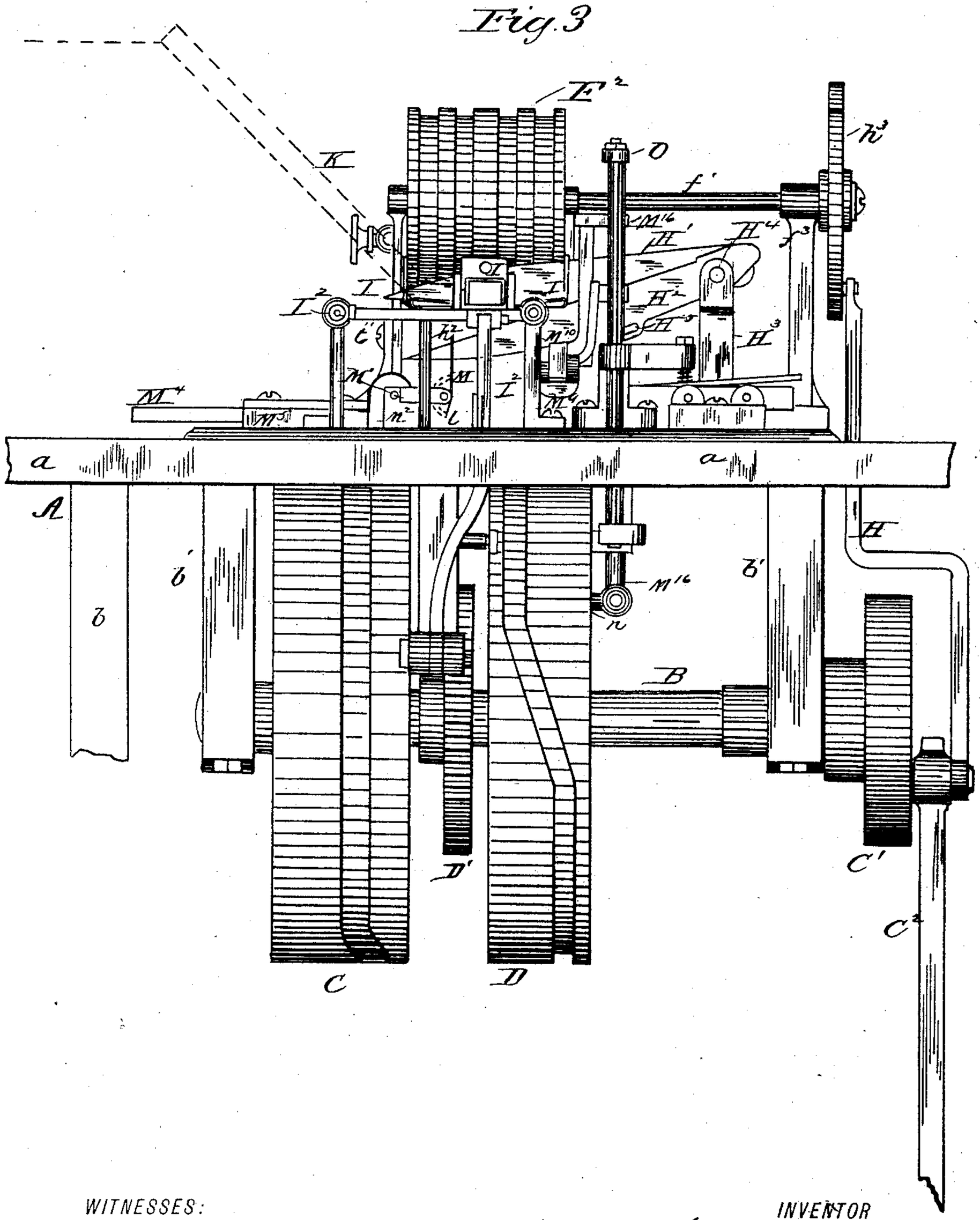
Fig. 3



WITNESSES:

A. A. Moore.

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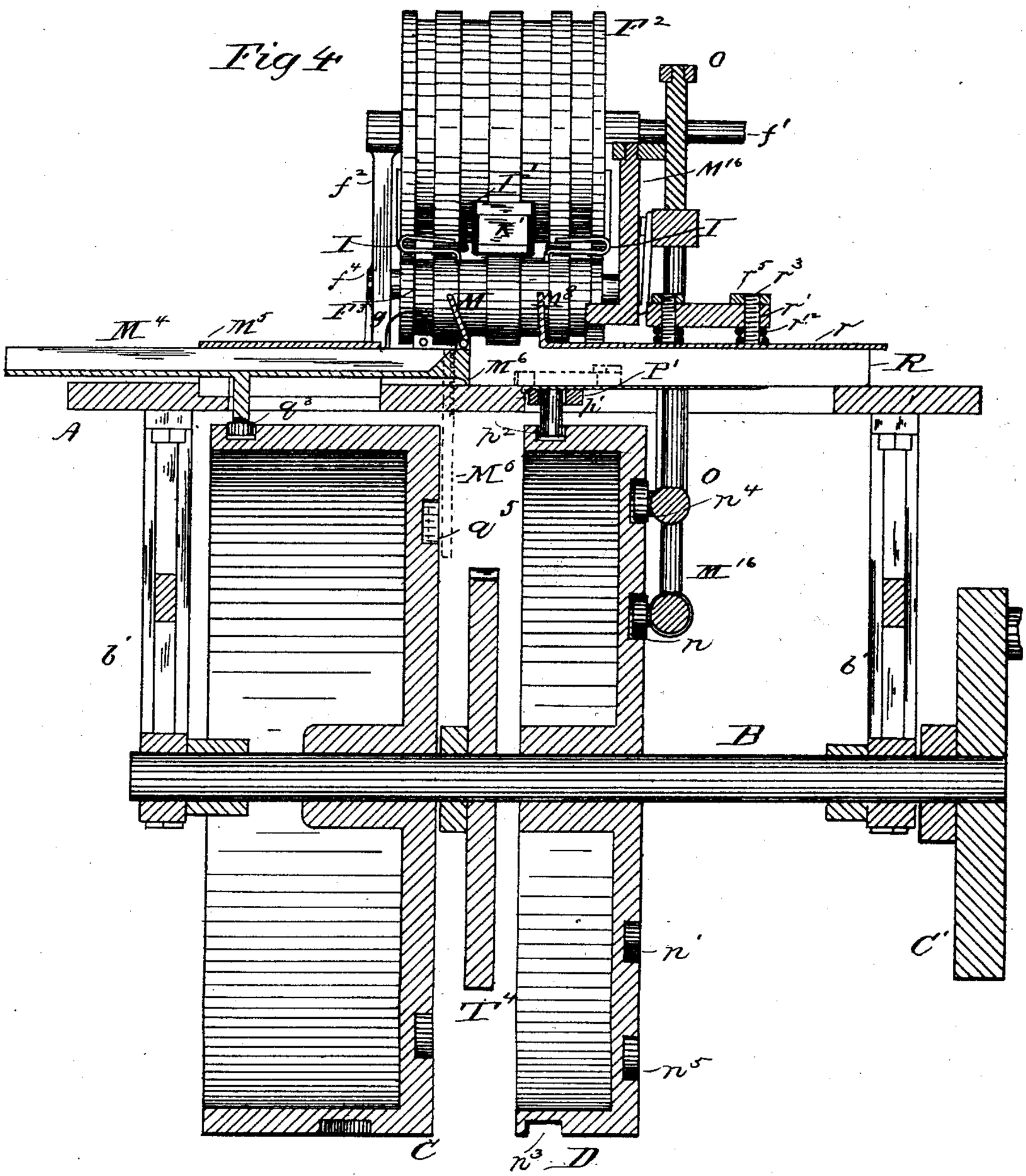
Fig 4



WITNESSES:

A. A. Moore

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W. S. JARBOE.

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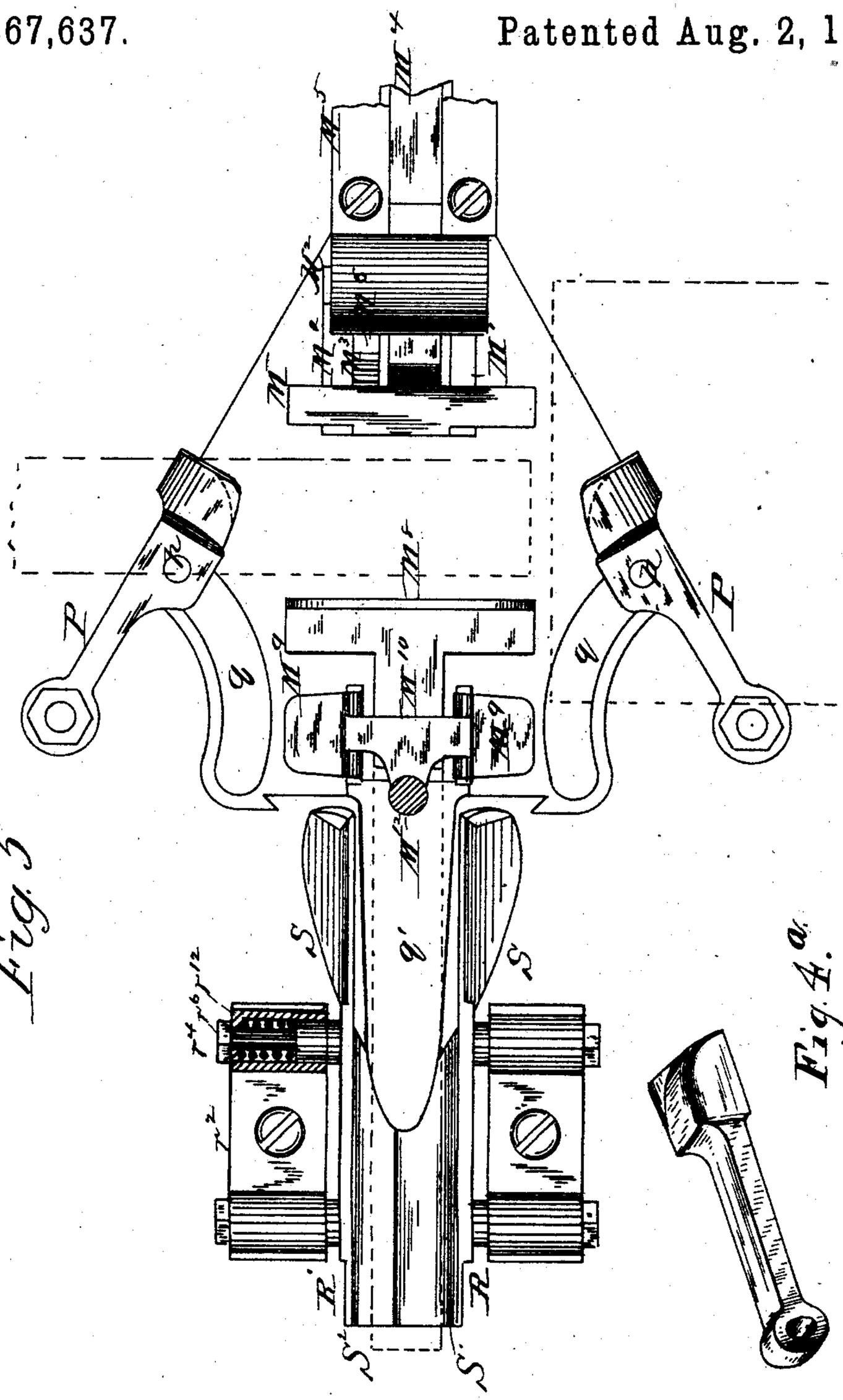

Fig. 5

Fig. 4a.

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W. S. JARBOE.

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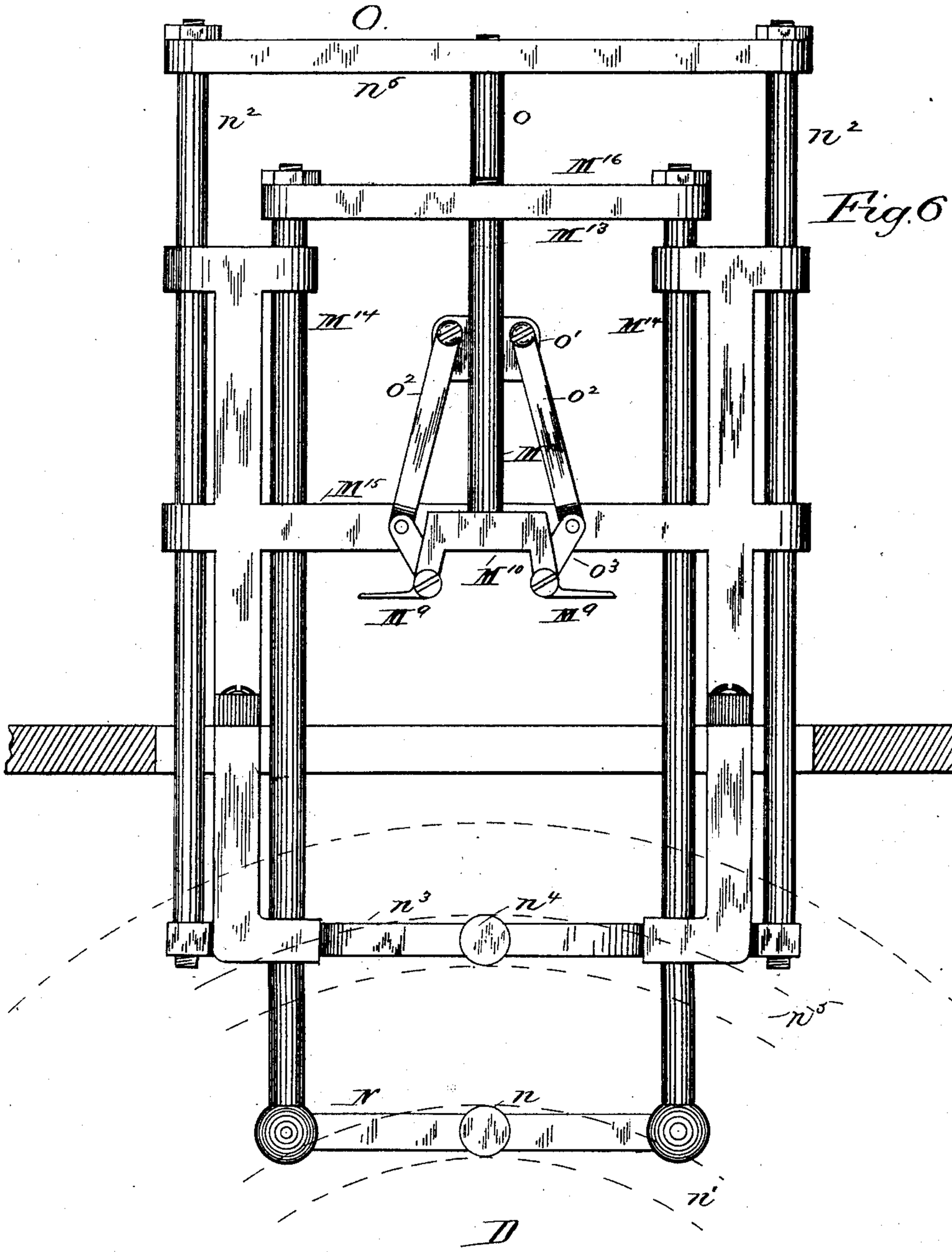

Fig. 6

WITNESSES:

A. D. Wilson

J. B. McGinn.

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W. S. JARBOE.

MACHINE FOR WRAPPING PACKAGES.

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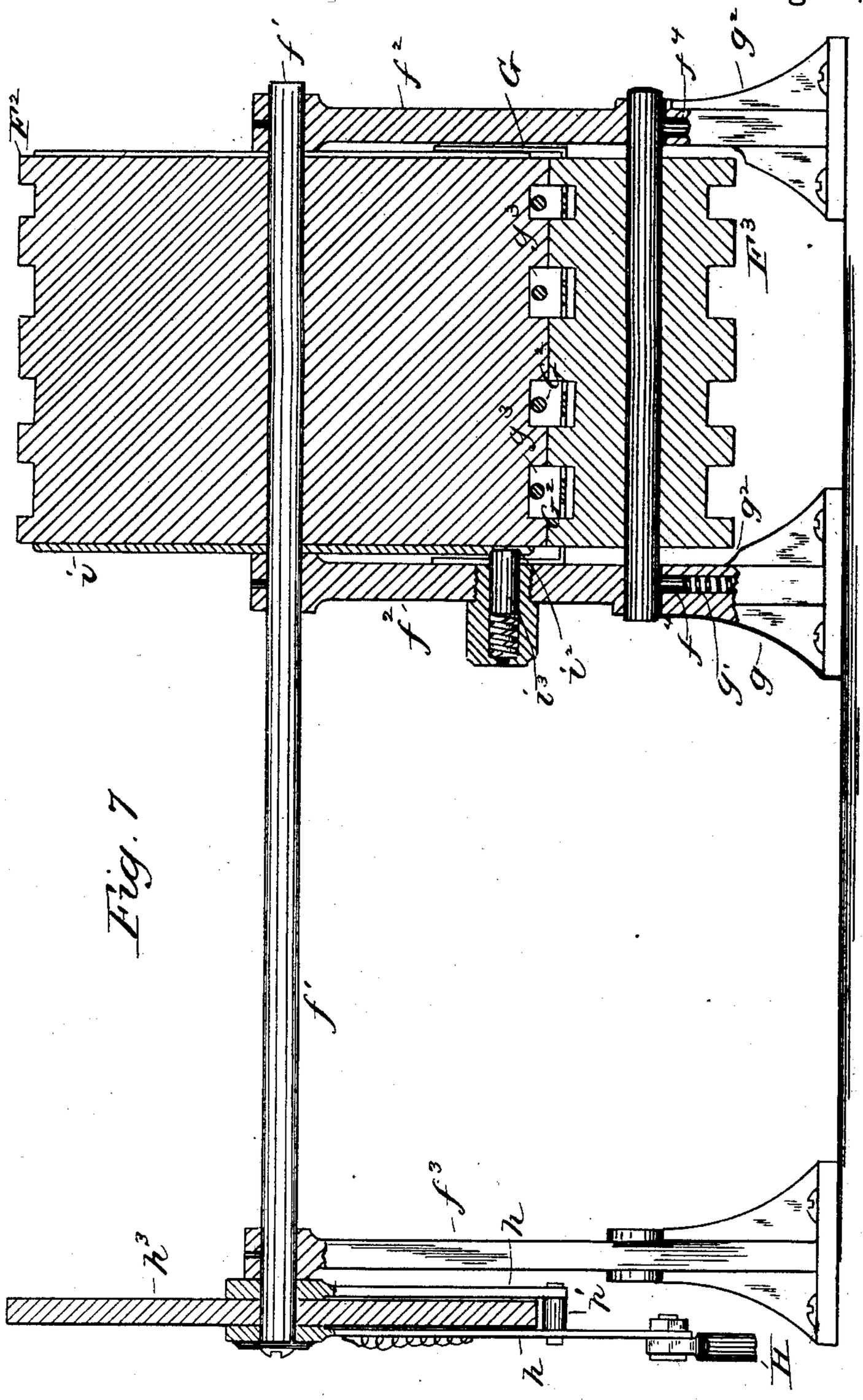

Fig. 1.

Witnesses
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W. S. JARBOE.

MACHINE FOR WRAPPING PACKAGES.

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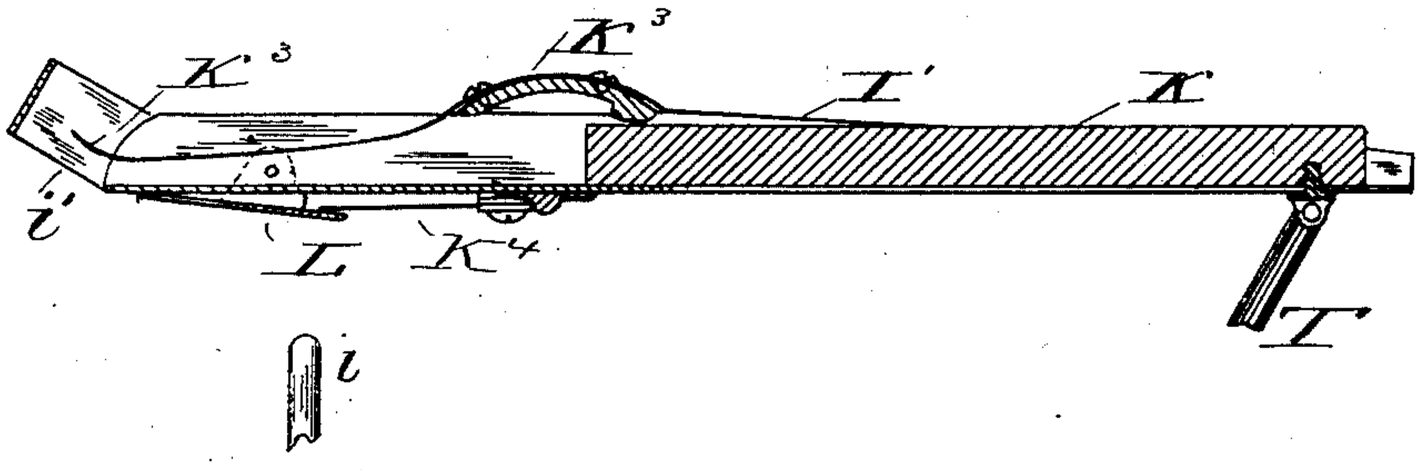
Fig. 8



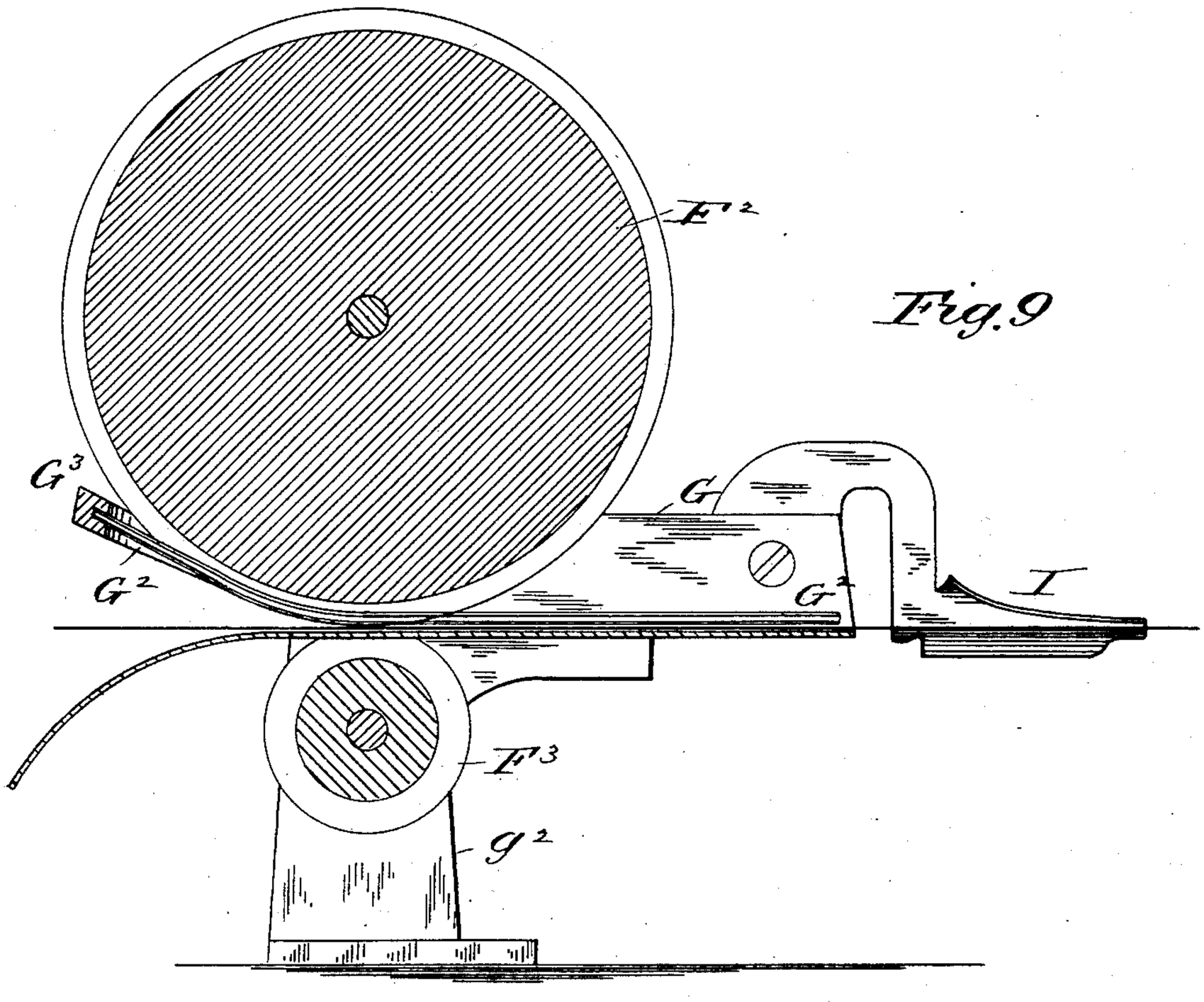


Fig. 9

WITNESSES:

A. Arnoux

J. B. McGirr.

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Walter S. Jarboe

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W. S. JARBOE.

MACHINE FOR WRAPPING PACKAGES.

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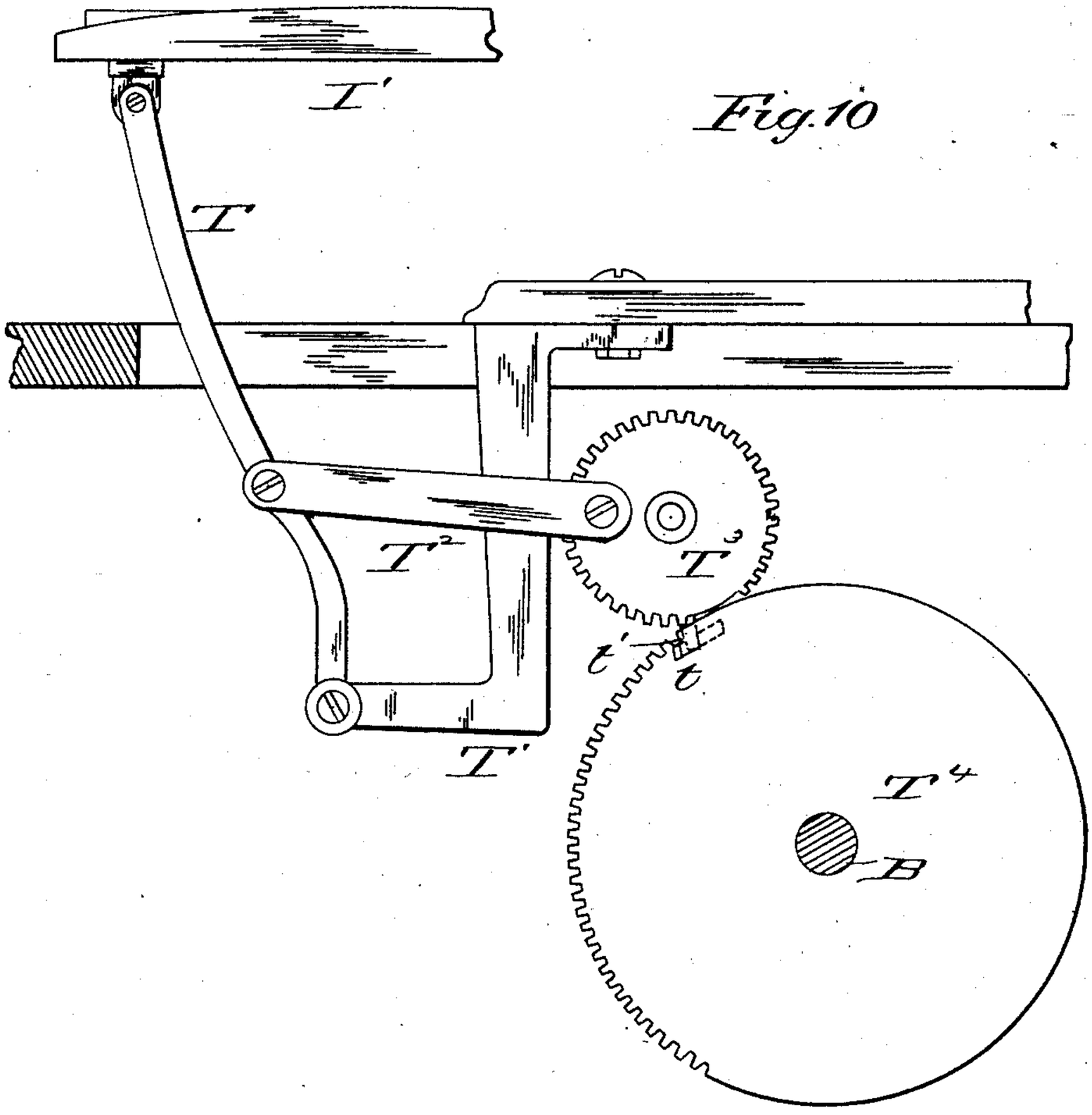
Fig. 10



WITNESSES:

A. A. Moore.

J. B. McLain.

INVENTOR

Walter S. Jarboe

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W. S. JARBOE.

MACHINE FOR WRAPPING PACKAGES.

No. 367,637. Patented Aug. 2, 1887.

Fig. 12.

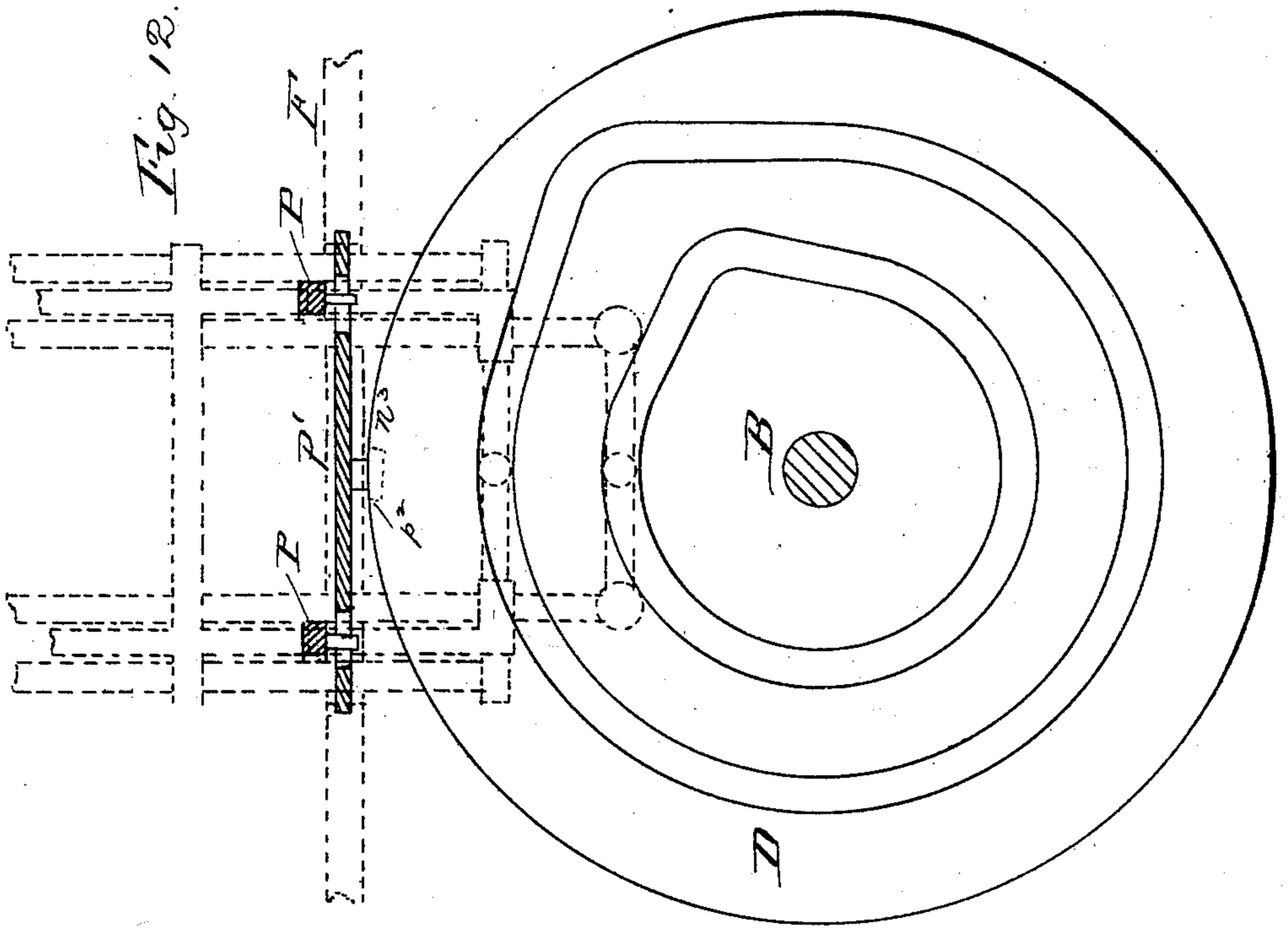
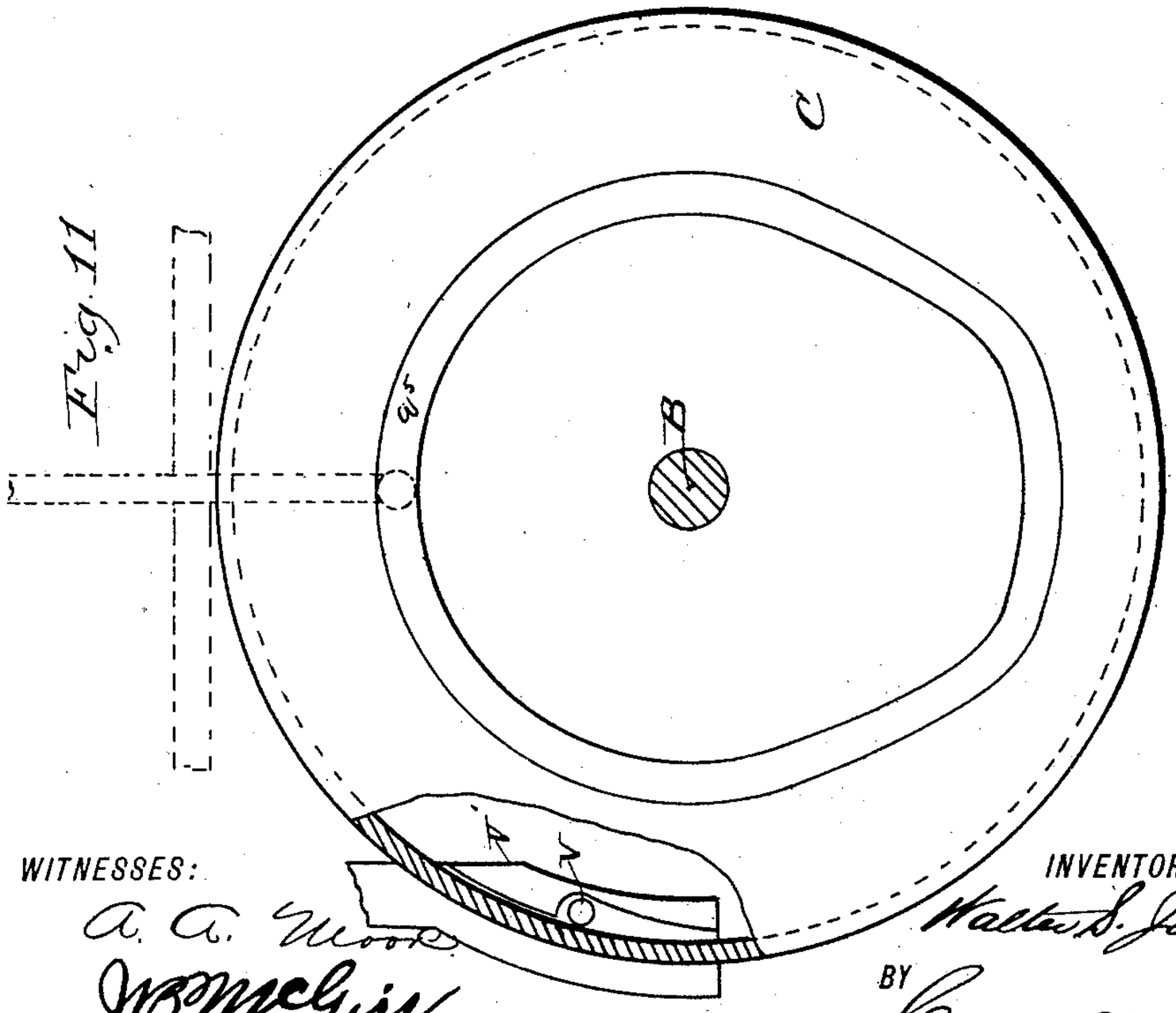


Fig. 11



WITNESSES:

A. A. Woods

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INVENTOR

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W. S. JARBOE.

MACHINE FOR WRAPPING PACKAGES.

No. 367,637. Patented Aug. 2, 1887.

Fig. 13.

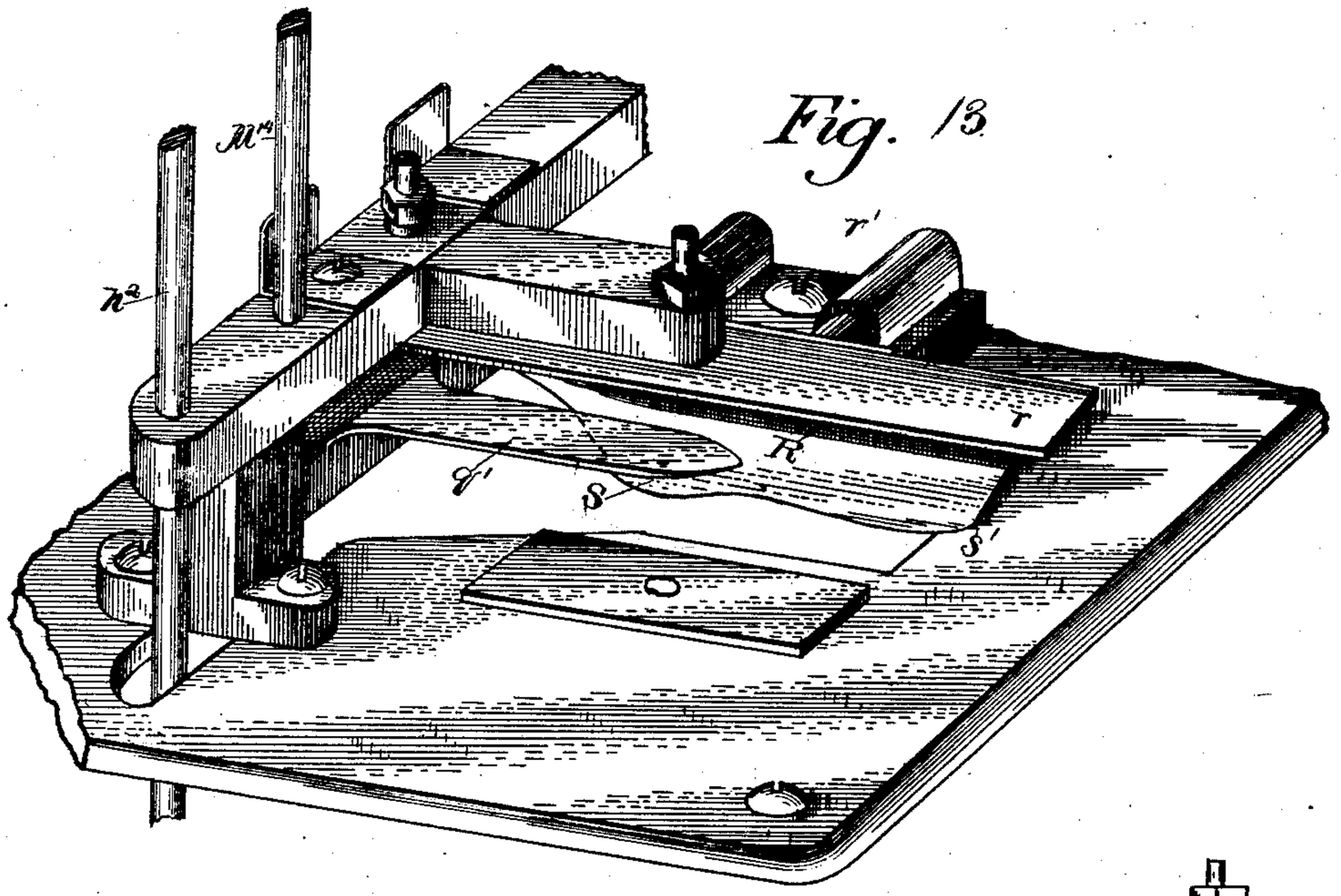
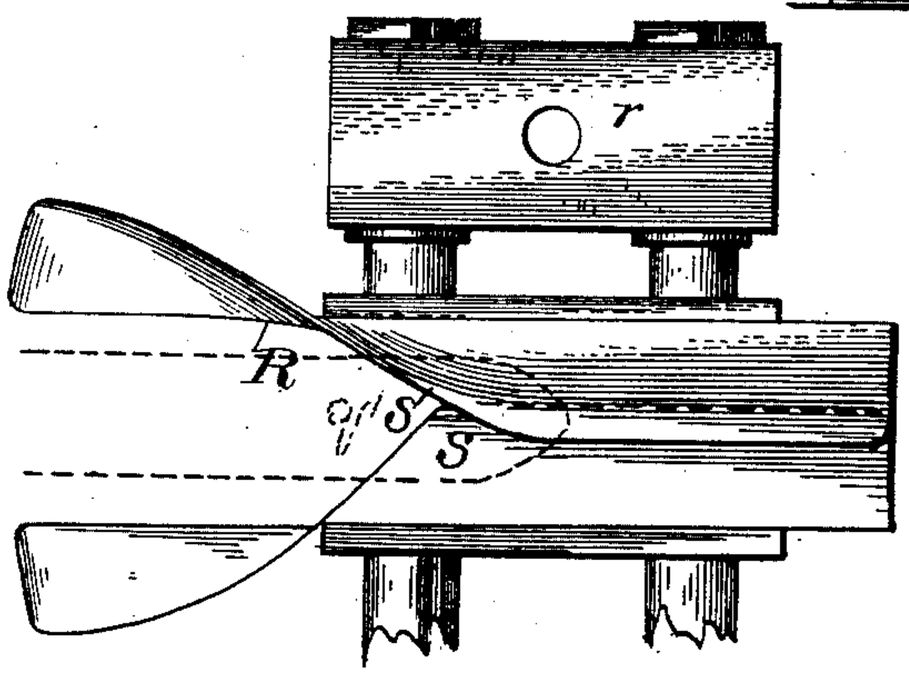


Fig. 14.



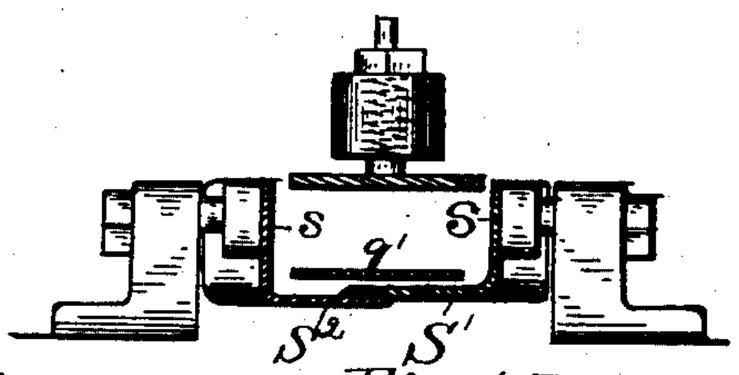


Fig 15.

WITNESSES

J. B. McGinn,

J. H. Stuart,

Walter S. Jarboe

INVENTOR

by Connolly Bro

Attorney S

UNITED STATES PATENT OFFICE.

WALTER S. JARBOE, OF ALLEGHENY CITY, ASSIGNOR OF ONE-HALF TO JOHN H. WILSON, OF PITTSBURG, PENNSYLVANIA.

MACHINE FOR WRAPPING PACKAGES.

SPECIFICATION forming part of Letters Patent No. 367,637, dated August 2, 1887.

Application filed October 8, 1886. Serial No. 215,673. (No model.)

To all whom it may concern:

Be it known that I, WALTER S. JARBOE, a citizen of the United States, residing at Allegheny City, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Wrapping Packages; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification.

My invention has relation to machines for automatically wrapping or applying paper covers or envelopes to packages or blocks of solid material, such as confectionery, soap, &c., and has for its object the provision of a novel machine wherein the various mechanical operations, comprising the feeding of the wrapping-paper and the material to be enfolded and the enveloping of the latter in the paper covers, shall be effected in a more expeditious manner and with more certain and uniform results than have hitherto been attainable.

A further object of my invention is to provide an automatic package-wrapping machine in which all the principal operations shall be performed through the agency of positively-acting mechanical devices, and the use of springs or other unreliable and uncertain devices avoided.

A still further object of my invention is to produce a package-wrapping machine of the simplest and most durable character compatible with the complex nature of the operations which it performs.

The machine embodying my invention comprises, in addition to the paper-feed, certain novel expedients for feeding and delivering the material to be wrapped or enfolded, as well as novel mechanism for laying the folds, and thereby securely inclosing the material on all sides, so that the packages shall present an attractive and uniform appearance equal or superior to packages wrapped by hand.

My invention consists in the novel construction and combinations of parts, hereinafter described and claimed, and embraces various details and combinations incidental to the completeness and operativeness of the machine.

In the drawings, Figure 1 is a perspective view of the machine. Fig. 1ª is a plan view of the machine. Fig. 2 is a side elevation. Fig. 3 is a front elevation. Fig. 4 is a section taken on line *x x* of Fig. 1. Fig. 4ª is a perspective view of one of the side angle folders. Figs. 5, 6, 7, 8, 9, 10, 11, 12 are detail views. Fig. 13 is a perspective view of one of the spirally-shaped folders in position and of the tongue and adjacent parts. Fig. 14 is an under side plan view of the spiral folders. Fig. 15 is an end view of the spiral wing-folders.

A designates a suitable table or stand upon which the operative parts of the machine are mounted, and which consist of the leaf *a*, supported on standards *b*.

To suitable brackets, *b'*, depending from the under side of the leaf *a*, is journaled a horizontal shaft, B, upon which are keyed the cams C D, the crank-wheel C', and the mutilated gear-wheel D', from which power and movement are conveyed to the other portions of the machine. The wheel or crank C' is coupled by a pitman, C^2, to the treadle-plate or the machine may be run by steam or other power and suitable connections, which need not be described.

The working parts proper of the machine are mounted on a base-plate, F, situated above the cams C D and about or nearly on a level with the leaf *a*.

F' designates the paper-reel mounted upon standards *f f* and located back of the plate F. Directly in front of the reel is arranged the upper feed-roll, F^2, having its shaft *f'* mounted in standards f^2 f^3. Below the roll F^2 is situated a smaller roll, F^3, which impinges against the roll F^2, but allows the strip of paper from the reel to pass between the two surfaces, sufficient pressure or purchase being obtained upon the strip to insure its movements regularly and evenly when the rolls rotate. The upper roll is operated positively, while the lower roll turns by frictional impact. To obtain this impact or pressure the shaft of the lower roll is journaled in boxes f^4 or recesses in the webbed standards *g*, and resting upon springs *g'* in sockets g^2, said springs tending to press the roll upward against the paper.

The feed-rolls are located at the rear end of an open-ended box, G, which constitutes a guide for the strip from the reel to the shears and beyond, and their adjacent surfaces or con-

tacting-points are on a line with the bottom of the box. Near the bottom of the box lie the wires or fingers G^2, connected at their near ends to a frame, G^3, secured to the standards f^2 f^2, and thence projecting forward to near the front end of the latter. These fingers are for the purpose of holding the strip of paper in position to enter between the shears and pass into the paper-guides, and are slightly curved upward at their rear ends to allow the paper from the reel a free passage. To accommodate these wires or fingers the feed-rolls are circumferentially grooved, as at g^3.

The feed-rolls may be made of any suitable material; but I purpose using a composition of paper-pulp or vulcanite fiber in their construction.

The paper-feed is operated from the main shaft through the pitman H, connected to the crank-wheel C′ and coupled to an arm or arms, h, loosely fitted on the end of the shaft f', and carrying a spring pawl or dog, h', which engages in one direction with the teeth of the ratchet-wheel h^3, keyed or otherwise rigidly secured to the shaft f'.

The feed-roll is designed to have an intermittent movement limited to a certain distance of revolution and to operate only at definite intervals, so that the projection of a sheet of paper shall take place alternately with the cutting of a previous sheet and with other operations of the machine.

In the machine illustrated, which may be taken as the type of a machine for wrapping small articles—such as caramels—the feed-wheel F^2 makes one-sixth of a revolution under each impulse, and the ratchet-wheel is accordingly formed with six teeth, with one of which the pawl engages at each impulse or throw.

To prevent the paper from being thrust too far, it is desirable that the rotation of the feed-wheel should be even and regular and limited in rapidity. It is also necessary that the movement of the feed-wheel should be limited, so as to stop when it has accomplished its movement the exact distance required to project the paper the length of a wrapping-sheet. For this purpose the feed-roll F^3 has fastened to one face a ring of metal, i, Fig. 7, pierced at intervals of one-sixth its circumference with beveled holes i^2, with one of which engages a spring-dog, i^3, attached to one of the standards f^2, when the roll has completed the movement, thus arresting the movement of the roll, and at the same time preventing it from turning backward.

H′ H^2 designate the shears, consisting of a pair of matched blades located at the forward end of the box G. The upper blade, H′, is stationary, while the lower blade, H^2, is pivoted, both being supported at their rear ends upon a post, H^3, in which is fixed a swivel-pin, H^4, rounded at one part to allow for the play of the pivoted blade and squared at another part to rigidly maintain the stationary blade. The blade H^2 is slotted at H^5 to receive the end of a bent bar, H^6, which is connected to a reciprocating frame, M^{16}, by which said blade is operated.

I I designate the paper guides or holders situated slightly beyond the shears, and consisting each of a metal plate bent or folded upon itself, so as to form a channel or recess between the upper and lower walls to receive the sheet projected through or between the shear-blades. The plates I I are connected to the feed-table and are made flaring or bell-shaped to facilitate the entrance of the sheets. After the sheets are cut they are severally held in the guides I I until pressed down upon the folding-table by the gripper and the impact of the package-chute, the latter being brought into action immediately after the cutting operation.

I′ designates the tilting package chute or tube, which consists of an elongated trough having trunnions t, through which it is mounted on standards I^2 I^2, located forward of and some distance beyond the folding devices. When the package-delivery trough is in a horizontal position, its floor is about on line with or slightly above the plane of the paper-feed table and jaws or holders I I. The inner end of the trough is closed; but an opening is made in the floor at i' for the removal of the material, while the walls at the sides of such openings are cut obliquely or at an angle to the floor of the trough, as shown in Fig. 8, so that when the latter is tilted the lower edge of the walls at the sides of the opening i' will be even with the surface of the folding-table. The inner end wall of the trough is also placed in an oblique position, so as to lie in a vertical plane when the trough is tilted.

The material to be folded is in blocks, cubes, or approximately cubical shapes, which are supplied to the trough from the table or hopper through a chute, K, which may communicate with the delivery-chute at one side or through an opening in the top of the latter, one cube or block at a time entering the delivery-chute at a point about midway between its ends. A plunger, K′, plays in the delivery-trough, and when the latter is in horizontal position the plunger lies just back of the opening through which the block of material is received. When the trough is then tilted, the plunger is projected forward by mechanism which will be hereinafter described, and forces the block of material toward the delivery end. A spring-tongue, K^3, secured in any appropriate way to the top of the delivery-trough and curved downward at its inner end, which is above the opening i', as shown, presses lightly on the block as it is being forced along by the plunger, so as to control its delivery, which takes place when the trough has been tilted to its final position.

On the under side of the delivery-trough, near its inner end, is situated a gripping device, L, consisting of a bent plate pivotally attached to the sides of the trough and capable of tilting or moving a slight distance on its

pivots or journals. A spring, K^4, secured to the under side of the trough, presses against the under side of the gripper, causing the forward end of the latter to impinge against the under surface of the trough, and thus serve as a jaw or clamp to grasp the paper after it issues from the paper-feed and projects beyond the funnel guides or holders. While the delivery-trough is rising at its inner end after having been tilted the clamp is closed, and when it is reaching a level with the paper the latter, moving forward, enters the jaw or clamp, the same being opened by a pin, K^5, on its side coming in contact with a stud or bent post, k^2. Upon the descent of the delivery-trough the clamp, being relieved from the post k^2 and closing by the pressure of its spring, firmly grasps the paper at its forward edge and draws it down out of the guides, holding the sheet until the jaw strikes a spring or post, l, which causes it to open and release the sheet. The block of material is now at the forward end of the trough, and is resting at its inner side upon the rear portion or edge of the delivery-opening i'. This position the block maintains, the sheet being under it, until the trough nearly reaches the limit of its descent, when it is projected by the thrust of the plunger K', which is continuing its movement, a sufficient distance to cause it to emerge through the opening i', the spring-tongue K^3 facilitating its escape. The wrapping-sheet has now reached the folding-table, but is not quite in proper relation to the folding appliances; but by further movement of the plunger both the block or package and the paper are shifted into proper position, the latter moving by frictional contact with the block. When this point is reached and the block and paper deposited on the table, the trough rises and the operations of the other mechanisms cease until the trough has reached its horizontal position and is in readiness to repeat its operations. The next step is to fold the first upper flap on one side of the sheet over upon the block or package, after the manner of hand folding, and this, as well as the succeeding folding motions, is accomplished by mechanism which I will now describe, first premising that while the folding operations are being performed with one sheet another sheet is being cut and delivered to the paper-clamps, preparatory to being brought under the action of the folders just as soon as the latter have returned to their first or normal positions after folding one package. The first top fold is produced by the wing-folder M, which is hinged between the sides of and to a horizontal frame, M', which is itself hinged to a vertical post or bracket, M^2, so as to yield under strain occurring when the package or blocks are a little oversized or irregular in shape. To the back part of the wing M is secured a segmental rack or pinion, M^3, meshing with a vertical rack, M^6, having a reciprocating movement imparted to it by the power mechanism below the folding-table. Behind the wing M and its rack and pinion is situated a plunger, M^4, playing between guides M^5, and capable of being thrust inwardly and against the partially-folded package as soon as the wing M has laid the first fold. The wing M stands normally in an upright or vertical position, the wrapping-sheet, when brought down, being doubled up to a ⊔ shape between the wing M and the opposing stationary wing M^8 or second top folder; hence, when the wing M is turned over, it lays the upper fold evenly down upon the block or package. Immediately afterward the plunger M^4 comes into play and forces the package to the opposite side, where it passes under the L-shaped stationary plate M^8, constituting the second top folder. By this action the second top folder is evenly laid. The package, being still moved by the plunger, is brought under the end wing-folders, M^9 M^9. The latter consist of two plates hinged on either side of a head piece or block, M^{10}, the parts being of proper dimensions, and are swung downward from their normal horizontal position to vertical positions in which they embrace the package at its ends, in their movement folding down the paper so as to form the first end folds. The wing M rises after having laid its fold, merely swinging back on its pivots. The end wing-folders being pivoted to the head-piece M^{10}, the latter is attached to the lower end of a vertical rod, M^{12}, forming part of a reciprocating frame, M^{16}, and fixed in a horizontal cross-bar, M^{13}, coupling two slide-rods, M^{14} M^{14}, which pass through holes in a casting or frame, M^{15}, and are at their lower ends coupled by means of a cross-piece, N, carrying an anti-friction roller, n, which travels in the cam-groove n' of a wheel, D, on the main shaft, whereby the frame M^{16} is reciprocated periodically. Another similarly constructed and operated frame, O, embraces the frame M^{16}, its vertical rods n^2 passing through holes in the frame M^{15}, and connected below the table by a cross-bar, n^3, carrying an anti-friction roller, n^4, which travels in another groove, n^5, in the wheel D. The upper cross-piece, n^6, of the frame O has depending from its middle part a rod, o, carrying on its lower end a block, o', which is coupled by pitmen or connecting-levers o^2 to crank-arms o^3 on the spindles of the wings M^9 M^9. The cam-grooves in the wheel D are so shaped and related that for the greater part they are circular and concentric, so that the frames M^{16} O are stationary until their proper periods of action arrive. Assuming now that both frames are at their greatest elevation and the folding-wings M^9 M^9 projecting out horizontally, the frames now begin to descend until the wings reach the level of the package, when the frame O advances alone, and hence the wings M^9, by the operation of the levers o^2, are turned down upon the paper and gradually fold the latter inwardly against the ends of package. The two frames M^{16} O now rise together, while the wings occupy vertical positions until the latter have risen above the

package, when, by the action and influence of the cam-wheel D, the frame O slightly rises, while the frame M^{16} descends, thus causing the wings to assume horizontal positions ready for their next descent. This peculiar action in regard to the side wings is important and conduces greatly to the proper operation of the machine. The proper periods of descent and ascent are exactly regulated and gaged, so that no false or unsought-for action can take place. By keeping the wings in a horizontal position until their proper period and place of action is reached, I avoid one of the chief defects in package-folding machines, wherein the folding-wings are brought edgewise against the sheet, forcing the latter through slots or into folding-cavities and frequently tearing or rupturing the paper. Again, by keeping the wings in a vertical position after having performed their work and until they have left the paper, I not only avoid another difficulty in regard to the tendency the wings would have to disturb the folds already produced, or in some cases to displace the package, but I am enabled to bring the angle wing-folders into action while the wings M^9 are down and the package is firmly held in position between them. The angle-folds are next produced, the first pair by the horizontally-swinging folders P P and the next by the stationary screw-folders, to be presently described.

The side angle-folders consist of the fingers or bars P, having their inner ends beveled and flanged, so as to produce surfaces which will operate evenly and smoothly on the paper. At their outer ends the fingers P are pivoted to the base-plate F of the machine, while near their forward ends they are provided with depending pins or studs *p*, which pass through curved slots *q* in the bed-plate and enter slots in a horizontal slide, P′, carrying an anti-friction roller, p^2, which travels in a groove, n^3, in the periphery of the cam-wheel D, and is reciprocated in an axial direction with reference to said wheel, so as to cause the folders to play each through the arc of a circle. When the folders M^9 have produced the side folds from the top of the block or package, and before they rise, the angle-folders are swinging inwardly, and in their movement press or fold inwardly and upon the wings M^9 the angle-folds on the outer side of the package. The package now continues its movement under the thrust of the plunger M^4, and upon the rise of the folders M^9 passes to the stationary screw-folders, which produce the second angle-folds and complete the folding operation by projecting V-shaped folds of the wrapper under and against the bottom of the package. The screw-folders consist, essentially, of the two bars or guides R R′, lying parallel with and opposite the guides M^5.

The forward or inner ends of the bars R R′ are flaring to receive the package, and the flaring portions are continued in the form of flanges S S, which are curved spirally back along the lower edges of the guides R R′ and terminate in overlapping slightly separated wings $S' S^2$, forming the floor or base of the rear portion of the channel or space between the guides.

The spiral flanges or screws are respectively curved in opposite directions, and are designed to operate as cams upon the paper, which, entering between them and thrust back, has its remaining angle-fold doubled over toward and upon the first formed angle-folds by the impact of the screw wings or fillets and the bottom folds turned in toward each other, one fold finding its way above the horizontal termination of a spiral, while the other passes between the two horizontal flanges. Between the forward sections of the spiral a spring-tongue, *q′*, is arranged, and upon the same the introverting folds are laid. This tongue is located above the plane or level of the flanges $S' S^2$, and the package lies or is supported upon this tongue while the folds are being formed by the spiral wings. The spirally-flanged bars R R′ form a box or channel, through which the packages, after being covered, are ejected from the machine; and in order to prevent this channel from being choked up, the top plate, *r*, and the bar R′ are supported on slides $r' r^2$ and held in place by springs r^{12} encircling screw-rods $r^3 r^4$, so as to yield slightly under the pressure of the packages and allow the latter to move freely. The tension of these springs may be regulated by nuts $r^5 r^6$. The folding or wrapping operations are thus completed, and the parts have resumed their proper position and relations for the succeeding steps incident to the folding of another package.

It will be seen that the different steps or operations succeed each other in such alternating methods that the folding operations are practically continuous, the packages and wrappers being in various stages of preparation for folding while one package is being carried through the folder. The speed attainable is therefore practically unlimited, and only governed by the common requirements of high-speed machinery and by conditions apart from the mechanical operations performed.

It remains now to describe the mechanism by which the delivery-trough, the plungers K′ M^4, and the first folder are actuated, the functions of these parts having been sufficiently indicated.

It will be observed that the delivery-trough and the plunger are both operated from and through a single connecting bar or lever, T, which is pivoted below the top of the machine to a stationary frame, T′, on which it rocks or oscillates in a vertical plane. The bar T plays through a slot in the top of the table, and at its upper end is connected by a hinge to the under side of the plunger, the hinge or connection passing through a longitudinal slot in the bottom of the trough. As the lever T rocks it performs a double function—that is, it tilts the trough and at the same time moves the plunger K′ forward and backward. To the

lower or short arm of the lever T is connected a pitman, T^2, which in turn is connected by a crank-pin to a toothed pinion, T^3, engaging with a larger toothed wheel, T^4, on the main shaft of the machine.

The motion of the trough and its plunger is periodical, and in order to produce and control their movement at proper intervals or periods the two intermeshing gears are mutilated, as shown, so that during about two-thirds part of its rotation the wheel T^4 turns with the main shaft independently of the pinion T^3, the trough and plunger remaining stationary, other operations of the machine already described being meanwhile performed. When the period of engagement of the toothed wheels arrives, a beveled stud, *t*, on the side of the wheel T^4 comes in contact with a pin, *t'*, on the side of the pinion and brings the two wheels into proper relation for conjoint action, whereupon the pinion rotates and the trough and plunger are moved, a single revolution of the pinion causing the trough to fall and rise and the plungers to move forward and then backward. The arrangement and operation of the gearing with reference to the delivery-trough are such that the latter is depositing its charge while the crank on the pinion is at its dead-point and the motion of the trough and plunger slowest. This is an important provision, as it prevents the material from being forcibly thrown from the trough or deposited out of line with the folding devices.

The plunger M^4 is operated from the cam-wheel C on the main shaft, the periphery thereof being properly grooved to receive an anti-friction roller, q^3, carried below and by the plunger M^4. In the face of said cam-wheel is formed another groove, q^5, in which travels an anti-friction roller carried on the standard to which is attached the rack M^6. The exact direction of curvature or other characteristics of the cam-grooves need not be specifically described. They are shown in the drawings, and are such well-known mechanical devices that their functions and mode of operation are obvious.

The machine is prevented from operating reversely by any suitable mechanism—as, for instance, by the well-known expedient of a ball or roller, V, carried in a tapering recess formed in a standard or plate, V', and so arranged as to contact with the periphery or flange of one of the cam-wheels. While the latter is moving in the proper direction the ball or roller occupies the widest portion of its recess and allows the wheel to turn freely; but upon any movement or attempted movement of the wheel in a reverse direction the ball is moved toward the contracted portion of its cavity, where it operates as a lock or brake to the wheel.

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

1. In a package-wrapping machine constructed and adapted to enfold solid cubes or blocks in paper wrappers, the combination, with a paper-feed which delivers the paper from a ribbon or strip, of a stop to arrest the momentum of the paper-feeding devices and a cutting instrument or appliance which severs each sheet from the strip, the paper-feed and cutter operating alternately, substantially as described.

2. In a machine for automatically wrapping or enfolding solid packages in paper wrappers, the combination, with the paper-feed, the tilting delivery-chute, and the paper folding and cutting appliances, of stationary flanged guides which receive and hold each sheet before and after separation from the strip or ribbon and previous to its being deposited upon the folding-table, said guides or holders being separated by a space for the passage of the descending wrapper.

3. In a machine for automatically wrapping or enfolding solid packages in paper wrappers or envelopes, the combination, with suitable wrapper delivering and folding appliances, of a chute or tube for the delivery of the packages upon the wrappers, constructed and adapted to tilt or swing in a vertical plane and to first receive and then deposit each package, substantially as described.

4. In a machine for automatically wrapping or enfolding solid packages in paper wrappers, the combination, with suitable wrapper delivery and folding appliances, of a tilting chute or tube for delivering each package separately upon the wrapper and a reciprocating plunger for feeding the packages toward the delivery end of the tube.

5. In a package-wrapping machine, the pivoted delivery chute or tube having a longitudinally-moving plunger, in combination with an oscillating or rocking lever or bar connected to said plunger, and operating, substantially as described, so as to both tilt the chute and project the plunger at each tilt or direct forward movement.

6. The combination, with the tilting delivery-chute, its plunger, and rocking lever, of a pitman or connecting-rod and a pair of mutilated gear-wheels through which motion is conveyed from the motor-shaft, said gear-wheels being constructed and adapted to intermesh and coact only at definite intervals or periods, substantially as described.

7. The combination, with the paper-feed and the delivery-chute, of a clamp applied to the latter and adapted to grasp each sheet of paper and subsequently release the same automatically, whereby as the chute is tilted toward the folding-table each sheet is brought down therewith and below the forward end thereof, substantially as described.

8. The combination, with the delivery-chute, its plunger, and suitable paper-depositing appliances, of a spring-tongue adapted to hold the block, cube, or package above the delivery-opening, substantially as described.

9. The combination of the delivery-chute, its plunger, the folding-table, and folding de-

vices, said plunger being actuated, substantially as described, so as to move the package and paper forward simultaneously as the package escapes, and thereby bringing both in proper relation to the folding devices.

10. In a machine for wrapping or enfolding solid packages in paper wrappers, the combination, with the pivotal wing for forming the first top overfold, of a stationary plate opposite said wing in the line or direction of the travel of the package, whereby the second top fold is produced as the package advances, substantially as described.

11. In a package-wrapping machine, the combination, with suitable operating mechanisms, of end folders consisting, essentially, of a pair of pivotal wings attached to a suitable cross-head, and two vertically-reciprocating frames differentially moving at periods of their strokes, one of said frames being connected to cranks on the spindles of the wings by levers or pitmen, whereby after said wings descend they are moved from horizontal to vertical positions, then lifted, and finally restored to their horizontal positions, substantially as described.

12. In a package-wrapping machine, an automatic folder consisting, essentially, of a pair of horizontal bars having spirally-curved wings or flanges which overlap each other at their outer terminals, in combination with a tongue upon which the package is received and moved and against which the final folds are laid.

13. In a package-wrapping machine, a pair of wing-folders mounted on a vertically-reciprocating frame or head and on horizontal axes, in combination with devices for reciprocating said frame or head and for maintaining said folders in vertical planes while they are being raised, substantially as described.

14. In a package-wrapping machine, a pair of spirally-flanged or winged fold-formers adjustably supported and capable of yielding under pressure, in combination with a tongue located between the flanged portions, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of October, 1886.

WALTER S. JARBOE.

Witnesses:
THOS. A. CONNOLLY,
JNO. F. ATCHESON.