(No Model.) 6 Sheets—Sheet 1.

J. B. HOWE.

HAT POUNCING MACHINE.

No. 540,445. Patented June 4, 1895.

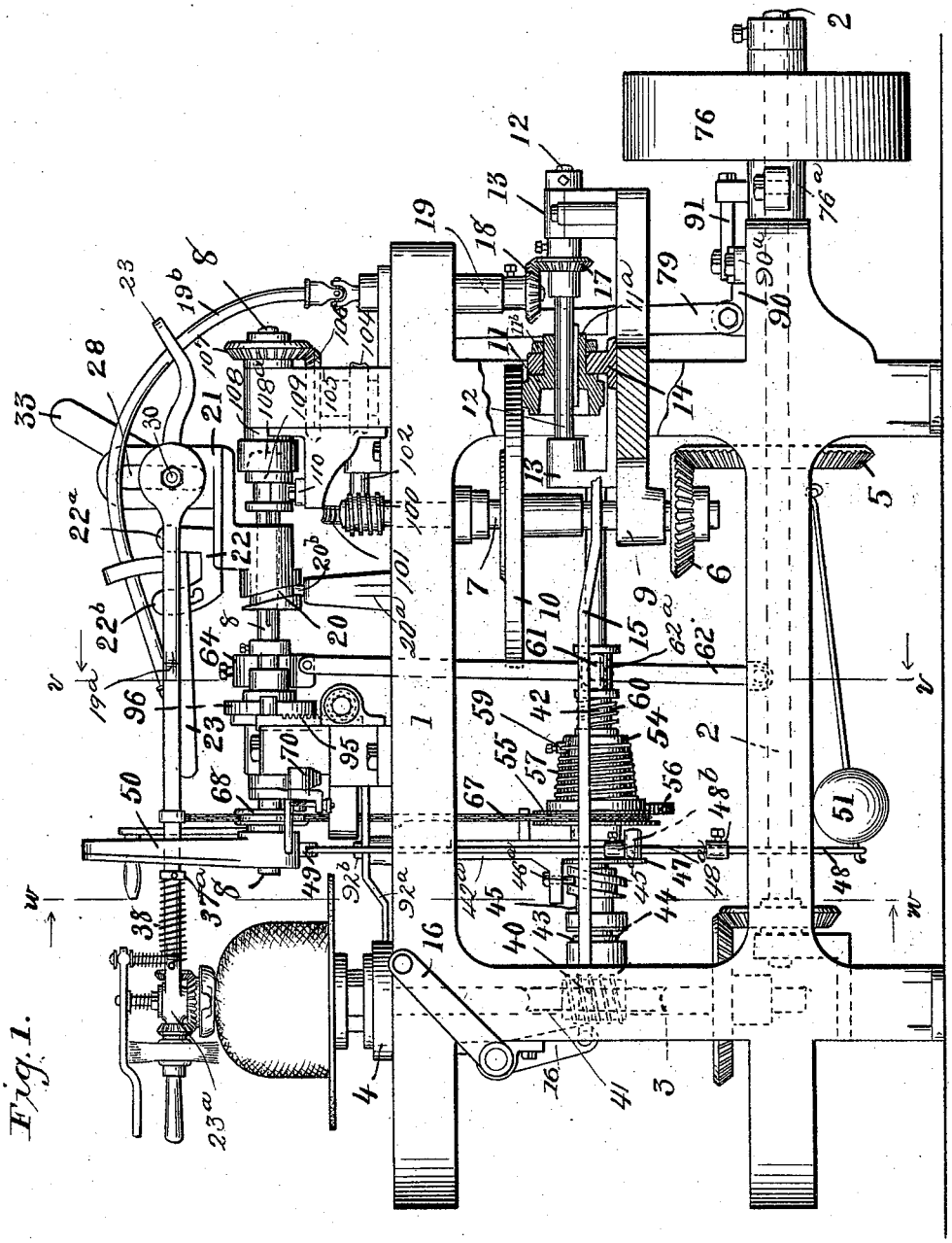

Fig. 1.

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(No Model.) 6 Sheets—Sheet 2.

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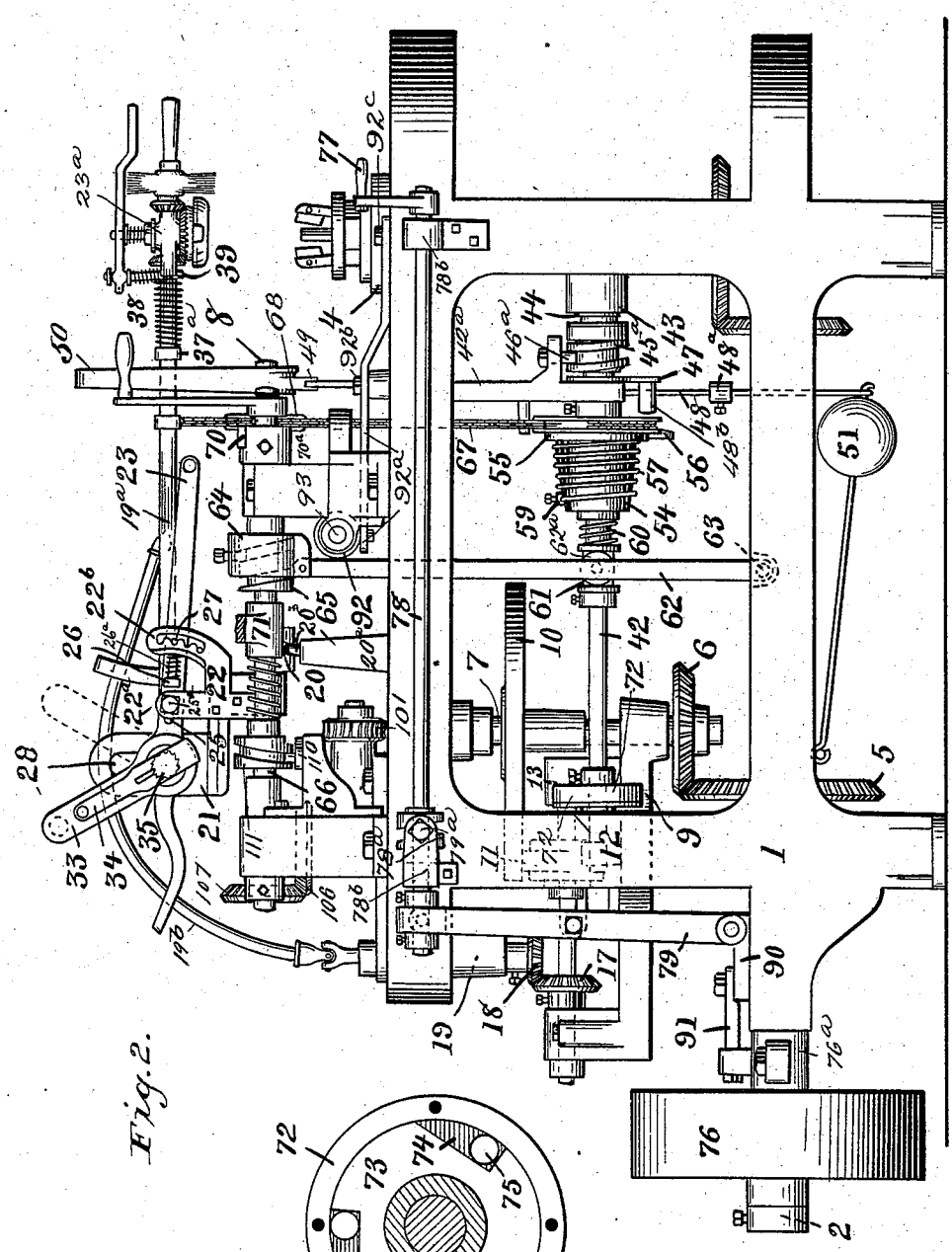

Fig. 2.

Fig. 8.

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(No Model.) 6 Sheets—Sheet 3.

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HAT POUNCING MACHINE.

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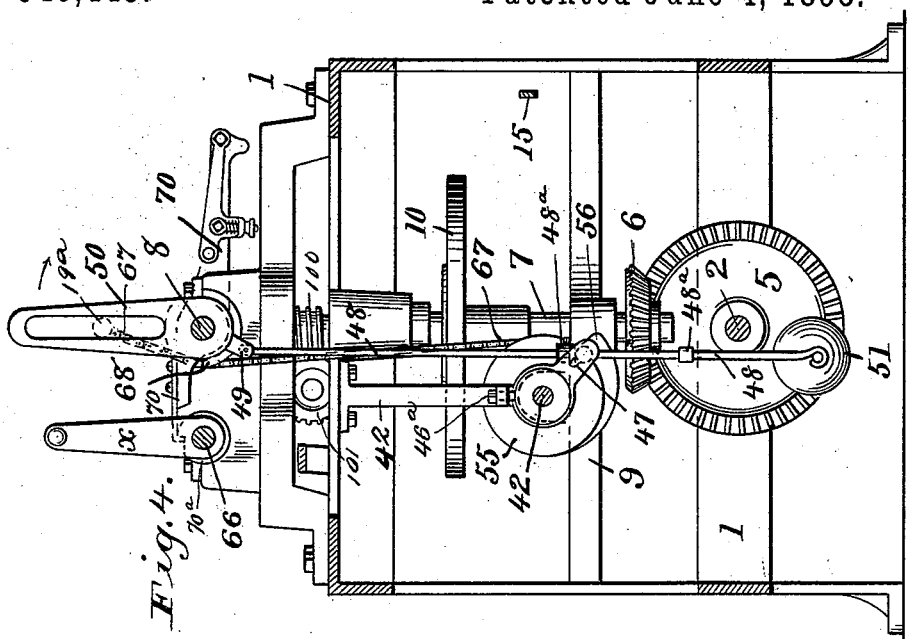

Fig. 4.

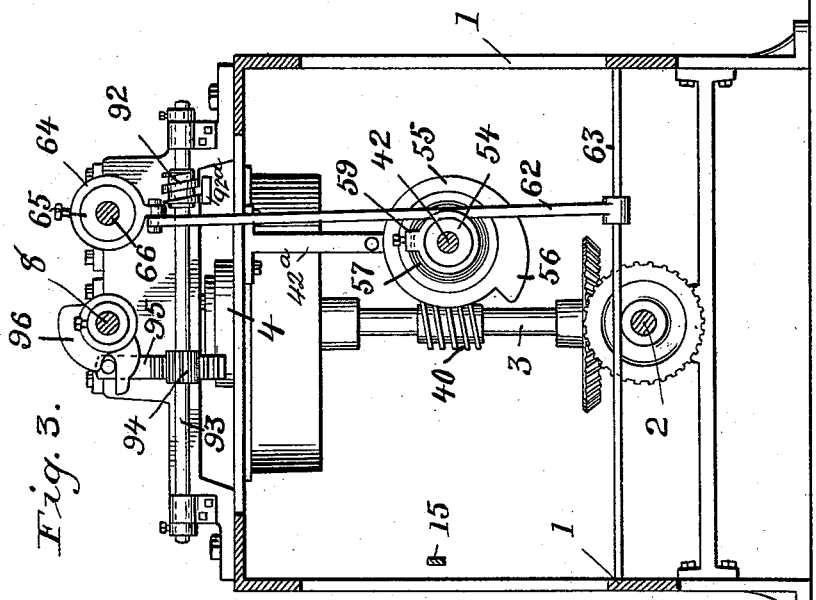

Fig. 3.

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(No Model.) 6 Sheets—Sheet 4.

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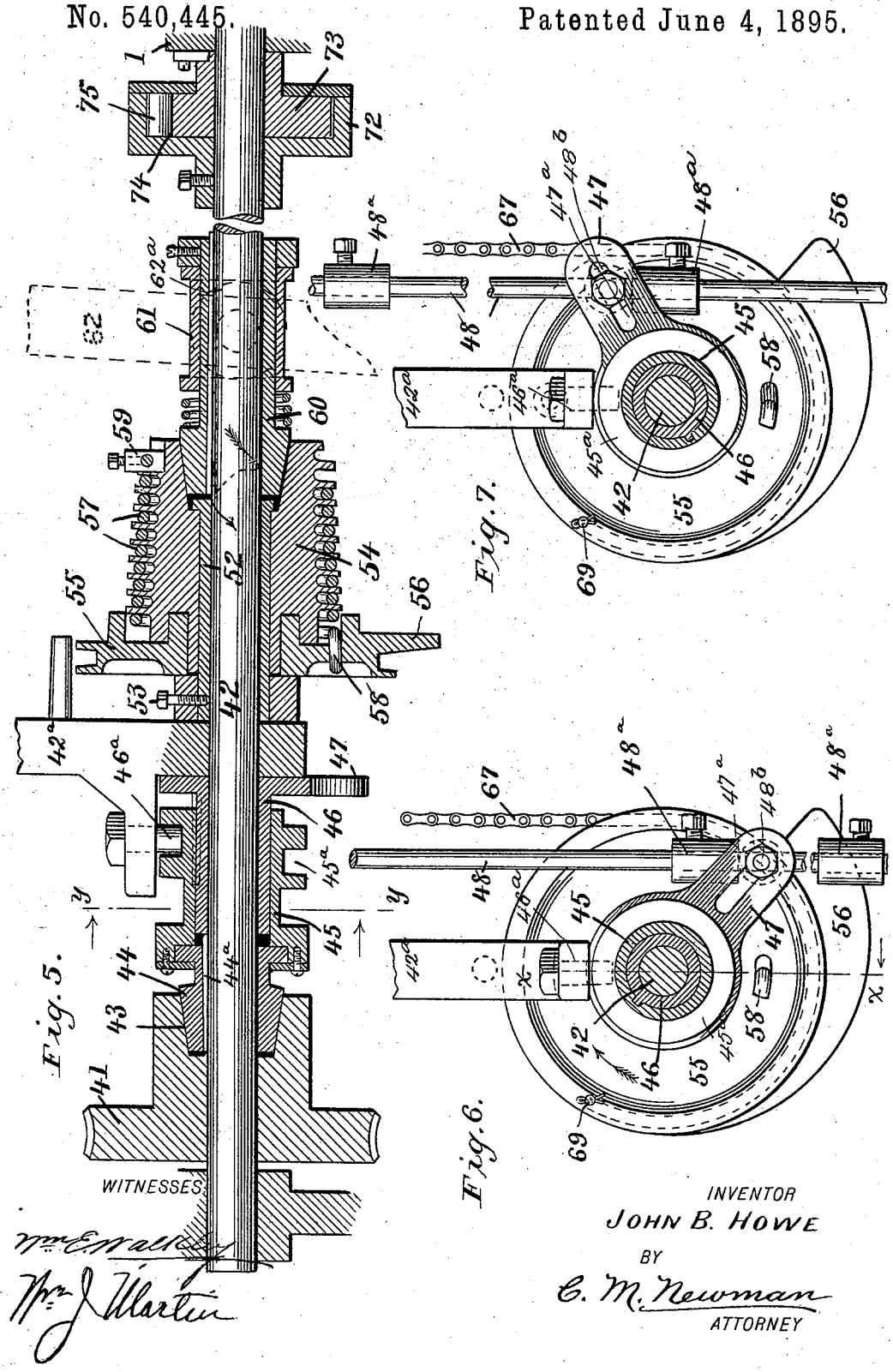
HAT POUNCING MACHINE.

No. 540,445. Patented June 4, 1895.



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(No Model.) 6 Sheets—Sheet 5.

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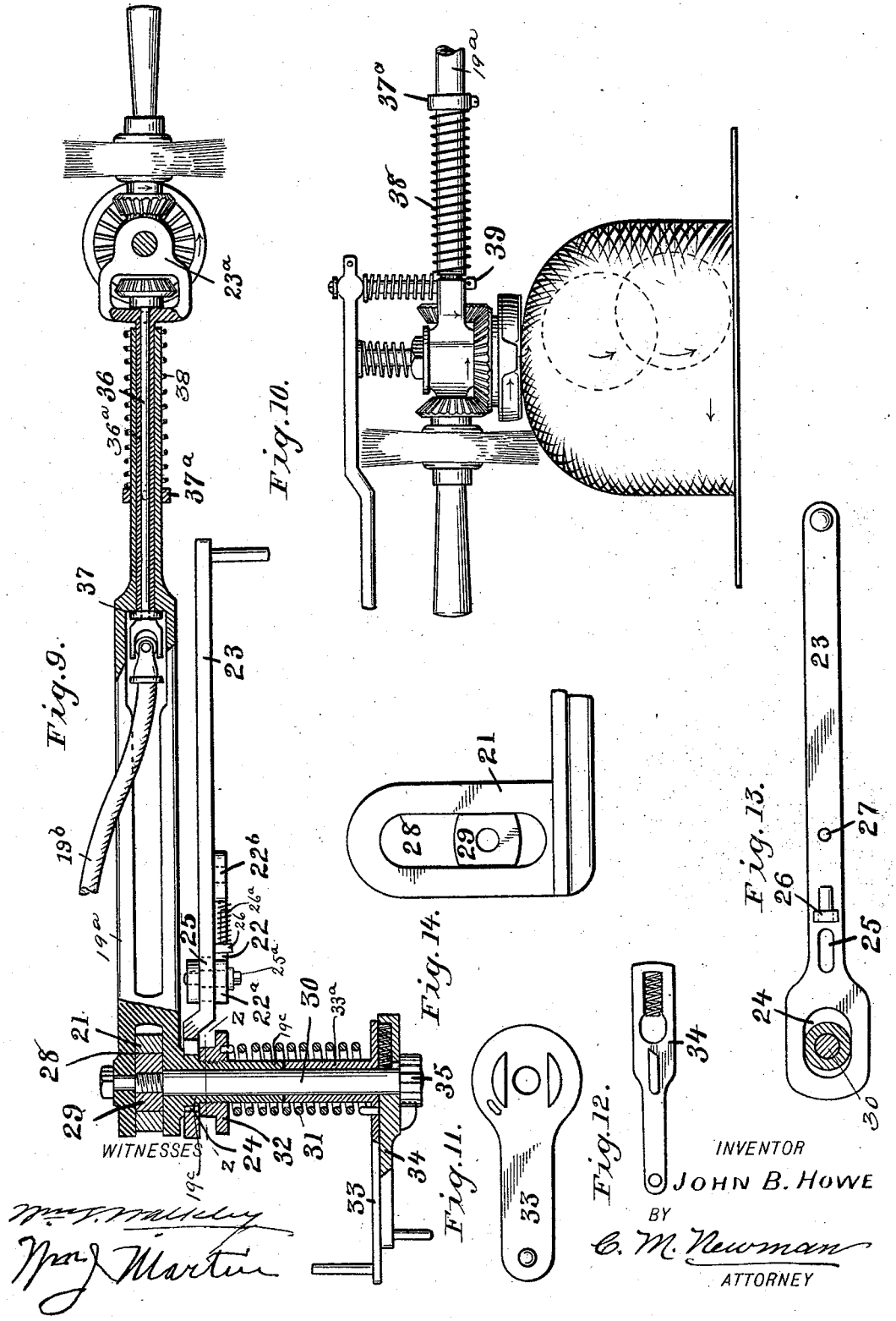
HAT POUNCING MACHINE.

No. 540,445. Patented June 4, 1895.



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J. B. HOWE.

HAT POUNCING MACHINE.

No. 540,445. Patented June 4, 1895.

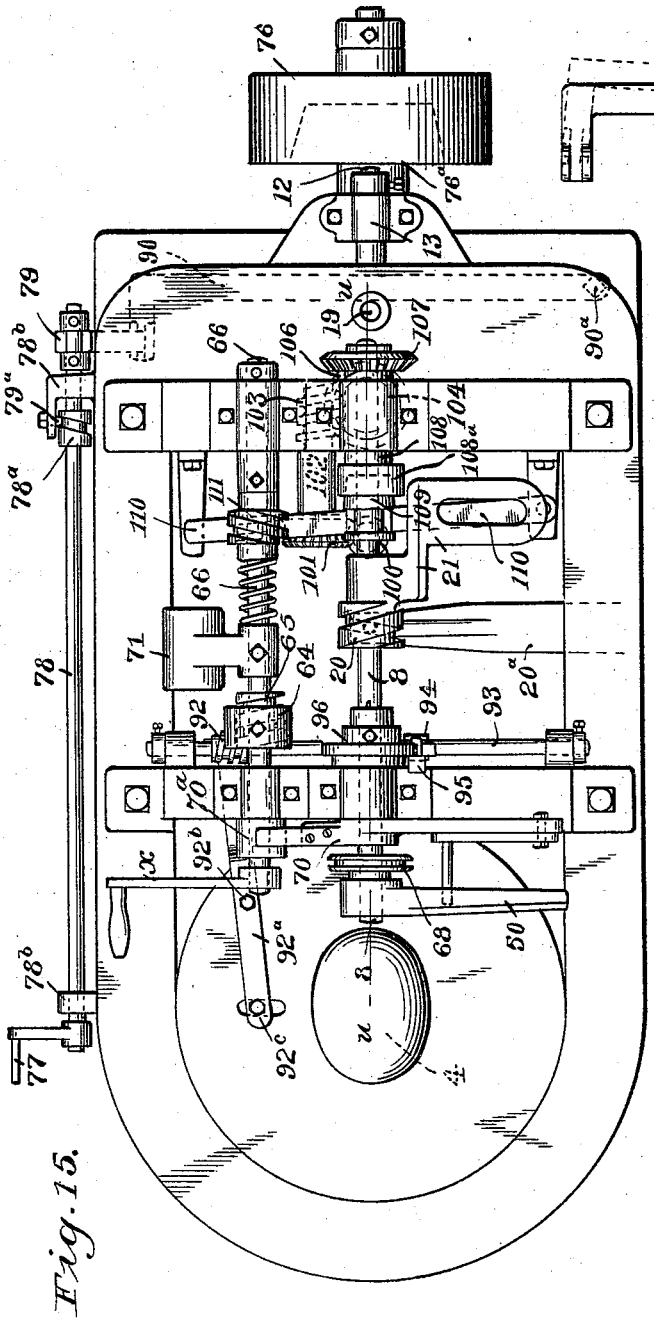

Fig. 15.

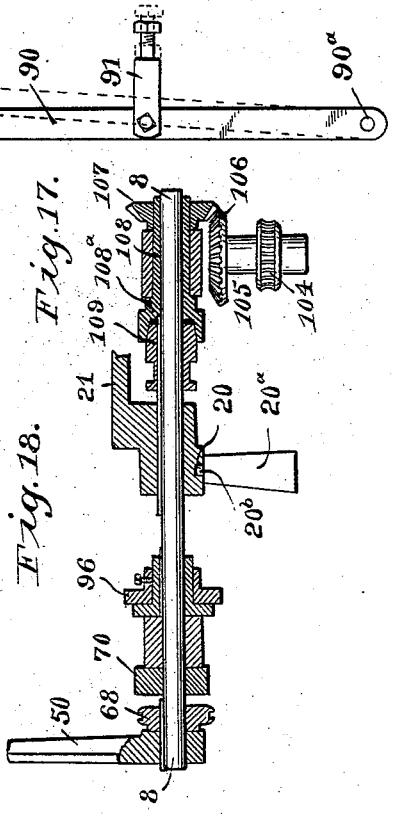

Fig. 17.

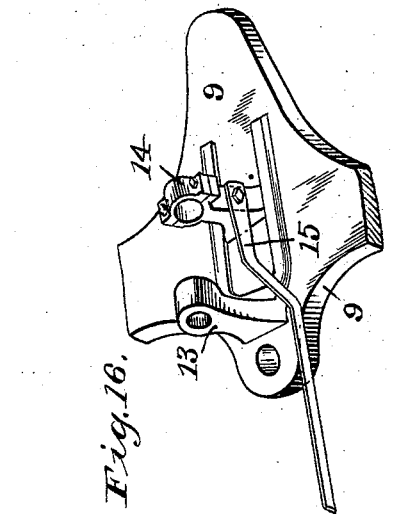

Fig. 18.

Fig. 16.

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C. M. Newman.

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UNITED STATES PATENT OFFICE.

JOHN B. HOWE, OF DANBURY, CONNECTICUT.

HAT-POUNCING MACHINE.

SPECIFICATION forming part of Letters Patent No. 540,445, dated June 4, 1895.

Application filed October 16, 1893. Serial No. 488,206. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. HOWE, a citizen of the United States, and a resident of Danbury, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Hat-Pouncing Machines, of which the following is a specification.

This invention relates to certain new and useful improvements in hat-pouncing machines, and is designed to treat a large variety of hats, both as to size and quality; and has for its object to provide a durable and light running machine which will not require the services of a skilled operator; to provide mechanism whereby the speed of the pouncer-head may be regulated in accordance with the grade of the hat to be treated and the quality of the work desired; to provide an automatic and constantly increasing tension whereby any desired pressure of the pouncer upon the hat may be secured; to provide mechanism by which the pouncer lever and head may be elevated to accommodate different sizes and heights of hats; and to provide means whereby the line of travel of the pouncer over the hat is both circular and oblique with relation to the center thereof, thus bringing the entire surface of the sand paper into play during the pouncing of each hat.

For the purpose of fully illustrating my improvements, I show them applied to a machine which is similar in many respects to that shown in my former patent, No. 490,788.

In the drawings, Figure 1 is a side elevation of a pouncing-machine embodying my improvements, a small portion of the frame-work being broken away. Fig. 2 is an elevation taken from an opposite side from that of Fig. 1, the hat being omitted. Fig. 3 is a cross-section of the machine on the line *v v* of Fig. 1. Fig. 4 is a cross-section on the line *w w* of Fig. 1. Fig. 5 is an enlarged longitudinal vertical section of the tension on the line *x x* of Fig. 6. Fig. 6 is a cross-section on the line *y y* of Fig. 5. Fig. 7 is a similar cross-section, showing the parts in a changed position. Fig. 8 is a side elevation of a friction-wheel which I employ on the tension mechanism and which is shown in Fig. 5. Fig. 9 is a plan view, partly in section, of the pouncer-lever, head, and other attached parts. Fig. 10 is a detached side view of the pouncer-head and hat, showing the line of travel of the pouncer over the hat. Figs. 11, 12, 13, and 14 show detached views, in detail, of parts attached to the pouncer-lever, Fig. 13 being a section taken on the line *z z* of Fig. 9. Fig. 15 shows a plan view of the machine, the pouncer-head, lever, and connecting parts being removed. Fig. 16 is a detailed perspective view of the bracket, having a slide mounted therein and pertaining to the speed-regulating mechanism. Fig. 17 is a detached view of the lever 90^a used in connection with the clutch mechanism. Fig. 18 is a longitudinal vertical section on a line *u u* of Fig. 15.

Similar numerals indicate like or corresponding parts in all the views of the drawings.

The main frame 1 of the machine is similar in essential features to that shown in my former patent above mentioned, as are also the main driving shafts 2 and 3, and the oval lathe 4. A bevel gear 5 upon the shaft 2 meshes with a gear 6 on a vertical shaft 7, and through intermediate gears, shafts, and worms, power is communicated to the horizontal feed shafts 8. Shaft 7 is suitably mounted in the frame at its upper end, and in a bracket 9 at its lower end; said bracket being secured to the frame at opposite sides and serving to support the speed regulating mechanism for the pouncer.

Shaft 7 carries a disk wheel 10 whose lower horizontal face is brought into engagement with the small frictional wheel 11 mounted on shaft 12, and splined thereto so as to be rotated with such shaft, and yet have an endwise movement thereon. Said wheel 11 is also provided with the elongated hub 11^a which latter extends through a hole provided in the upper end of the slide 14 and is secured thereto by means of the collar 11^b. This arrangement allows said friction wheel to freely rotate, while its movements over the face of the disk wheel 10, to and from the center thereof to regulate the speed of the pouncer 23^a, is controlled by the crank 16 through the medium of the rod 15, the rear end of which is operatively connected to the before mentioned guided slide 14 (see detailed Fig. 16) which in turn carries said friction wheel 11. Upon the shaft 12 is keyed a bevel pinion 17 which

meshes with and drives another pinion 18 on a short vertical shaft 19; and, attached to said vertical shaft 19 is a short flexible shaft 19^b which is connected with the shaft 36 in the pouncing lever 19^a, and serves to drive the pouncing head.

It will be seen from the foregoing, that if it is desired to either increase or decrease the speed of the pouncer head, the operator has simply to manipulate the crank 16, a movement of which toward the rear, as in Fig. 1, will increase the speed of the pouncer head, while a movement toward the front will have an opposite effect. This change of speed is essential in changing from one grade of hats to another.

Upon the feed shaft 8 I place an angle arm 21 which is provided with a cam groove 20 in the hub thereof. Said arm as will be seen is splined to its shaft and is subject to a sliding movement thereon by reason of its cam groove 20 engaging a terminal pin 20^b of a stud 20^a made fast to the frame. The purpose of this angle arm is to support the pouncer lever and head and control them in one of their movements. It will thus be seen that any rotary movement of the shaft will be imparted to the angle arm, and that a sliding movement of the arm by reason of said rotary movement, and the engagement of its cam groove with the before mentioned terminal pin, will be communicated to the pouncer head operating upon the hat. The feed shaft 8 begins its slow rotary movement from the position shown in Fig. 1 (see also Fig. 10) in which views it will be observed that the rotary pouncer head begins its operation central with the center of the top of the hat crown. The shaft 8 in its movement rotates to the right, viewing Fig. 1 in front at left end see also Fig. 4, carrying with it the angle arm, pouncer lever, head, &c. As said head travels over upon the side of the hat, it will be observed, (see circles Fig. 10) that its center has been drawn rearward from the center of the hat by reason of the connection between the cam groove in the angle arm, and the stud, as previously described. It will also be understood that the practical amount of work of the head is increased upon the sides of the hat crown since the head is then cutting away from its center. This is advantageous since the hat requires more work upon its sides than upon the top and quarters.

In order to properly adjust the pouncer head 23^a, and its lever to the various heights of hats, I have provided the following means viz: Upon the angle arm 21 is secured a bracket 22 (Figs. 2 and 9) which is provided with arms 22^a and 22^b. To the arm 22^a is pivotally connected an operating lever 23 shown in Figs. 2 and 13, which is provided with orifices 24 and 25, to receive the hub 19^c of the pouncer lever, and fulcrum pin 25^a respectively, for the purpose of permitting a lengthwise movement of the operating lever 23. Said lever is further provided with studs 26 and 27. Around the stud 26 is coiled a spring 26^a which abuts against the arm 22^b, the latter being provided with a series of notches in which the stud 27 may be seated. It will be seen that a forward movement of said lever 23 will disengage the stud 27 from its seat, after which said lever may be tilted on its pin 25^a, so as to adjust the hinge connection of the pouncer lever 19^a to and from the feed shaft 8. The angle arm 21 is provided with an oblong opening 28; and fitted loosely therein is a sliding block 29 to which is fixed a stationary shaft 30, forming a fulcrum for the pouncer lever. In order to counterbalance the weight of the pouncer lever 19^a, and secure any required pressure of the pouncer upon the hat at the beginning of an operation, and to force the pouncer from the hat at the completion of the operation, I have provided mechanism, as shown in Fig. 9, consisting of a torsional spring 31, one end of which is secured to a collar 32, arranged upon the hub 19^c of the pouncer lever, and the other end of which is secured to a lever 33 provided with a hub 33^a extending around the fixed shaft and meeting the hub of the pouncer lever about midway, the spring being disposed to encircle the two. In order to retain the desired tension of the spring, I have fitted to the lever 33, in a suitable guide-way Fig. 11 a spring-actuated slide 34 having a lug Fig. 12 which engages the teeth of the ratchet 35 fixed to the said shaft 30. It will be seen that by the handle the lever 33 can be turned in either direction and can be secured at any point by means of the above mentioned locking slide. By turning the handle to the left, as shown in Fig. 2, the tension of the spring is increased, thus lessening the pressure of the pouncer upon the hat; whereas by turning the handle in the opposite direction, the tension is decreased, and the pressure upon the hat increased. The above means of adjustment dispense with a multiplicity of weights, and insure an even and accurate adjustment of the pouncer upon the hat.

The pouncer head 23^a, is mounted upon a hinged bifurcated pouncing lever 19^a, and receives its power from the flexible shaft 19^b through a short shaft 36 which is housed within the shank 36^a of the head. This shaft is provided at one end with a knuckle joint, by means of which the flexible shaft is connected thereto, and at the opposite end it carries a bevel pinion meshing with the bevel pinion of the head.

It will be observed that the shank 36^a of the pouncer head 23^a is loosely fitted into a bore of the lever 19^a and is secured therein by means of a collar 37 upon the end of said shank. This construction permits a slight oscillatory movement of the pouncer head and shank 36^a within the lever 19^a, so as to more readily adapt its position to the conformation of the hat. In order to steady the pouncer and prevent it from tilting while pouncing the side of the hat, I employ a spring

38, the torsional action of which operates to keep the working face of the pouncer head parallel with the surface of the hat crown while pouncing the quarters and sides thereof, said spring 38 being connected at one end to a collar 37^a upon the pouncing lever, and to a stud 39 upon the pouncer head. The tension upon this spring 38 may be adjusted at will to accommodate the shape of the hat crowns, by the collar 37^a. (See Fig. 10.)

From the above description it will be seen that as the pouncer descends from the tip to the side crown of the hat there is a tendency upon the part of the counterbalancing devices above described to decrease the pressure upon the hat owing to the fact that the weight of the pouncing head, already partially overcome by the counterbalancing device, is no longer exerted on the hat in a vertical plane; whereas the pressure should be increased since the hat requires more work upon the side than the tip, and therefore I have provided automatic means (see Figs. 5, 6, and 7) for increasing the pressure as desired upon the side crown of the hat as the pouncer head descends from the tip along the side crown thereof in its operation, the construction being as follows: On the vertical shaft 3 is a worm 40 transmitting power to a gear 41, upon a shaft 42, which is hung in a bracket 42^a near one end, and is journaled in a suitable bearing in the bracket 9 at the other end. The gear 41 which is loose upon the shaft is provided with a hub having an internal clutch face 43 forming one member of a clutch, of which the other member is shown at 44 and is splined to the shaft by a key 44^a. This clutch forms the operating connection between the shaft and the driving mechanism. The extremity of the member 44 of the clutch is loosely journaled in the end of a sleeve 45 which is splined to a sleeve 46 loose upon the shaft and having an arm 47. The sleeve 45 is provided with a cam groove 45^a to receive a guide-pie 46^a, said pin being firmly held in a projection from the bracket 42^a. The sleeve 46 is loose upon the shaft and may be rocked in either direction by means of the rod 48. (See Figs. 4, 5, 6, and 7.) Said rod is connected with a lug 49, on the arm 50, of the shaft 8. It will thus be seen that when the arm 50 is elevated to a vertical position as in Figs. 1, 2 and 4, the rod will be forced down, and by means of its connection with the arm 47, will operate the latter together with its sleeve, and the sleeve 45 mounted thereon, thereby causing the engagement of the clutch members. At the lower end of the rod 48 is suspended a weight 51 which serves to counterbalance the weight of the bifurcated arm 50 and the pouncing lever supported therein while descending in their operation. The connection between the rod 48 and the arm 47, (see Figs. 1, 6 and 7) consists of a sleeve 48^b loosely secured within a slot 47^a of said arm 47, and is provided with a hole through which the rod is free to move vertically. Upon the rod, above and below the sleeve 48^b are secured adjustable collars 48^a which engage said sleeve and operate the arm 47 at each movement of the before mentioned rod 48.

Referring to Figs. 1 and 4, it will be clear that the adjustable collars 48^a do not fit snugly against the sleeve 48^b and may be set at any desired distance apart, thus allowing the latter a slight movement while the rod travels a considerable distance, the arm of the sleeve 46 being engaged only at the extremities of the movement of the rod 48.

Upon the shaft 42, is a sleeve 52 secured in place by set screw 53, and upon this sleeve is mounted a winding drum 54 which supports a loosely mounted wheel or disk 55 provided in its periphery with a groove. A weight or enlargement 56 also forms a part of this wheel or disk. The face of the winding drum 54 is provided with a spiral groove for the reception of a torsional spring 57, one end of which is secured to the loosely mounted wheel at 58, and the opposite end of which is secured to a lug 59 upon the drum whereby the only connection between the wheel and drum is through said spring. At one end of the drum is an opening forming the female member of a clutch, and adjacent thereto is a sleeve 60 slidably mounted upon the shaft and having at one end the male member of the clutch, said sleeve being provided with a collar 61 having a groove in its periphery to receive a roller 62^a (see dotted lines Figs. 1 and 5) upon a lever 62. The lower end of this lever is hinged to a rod 63 suitably secured to the framework, and the other end of the lever is attached to a sleeve 64 having a pin fitting in a groove cam 65 upon the rock shaft 66 which is parallel with the shaft 8. It will be seen that a partial rotation of this rock-shaft 66, and the cam 65 will operate the sleeve 64 and its lever 62, bearing the roller 62^a, which engages collar 61 of the clutch sleeve 60, thereby causing the engagement and disengagement of the clutch members thus making or breaking the connection between the shaft 42 and the winding drum 54.

A small chain 67 is secured at one end to the pouncing lever, passes over a recessed wheel 68 on the shaft 8, extends downward and around within the groove of the before mentioned wheel or disk 55, and is secured to the said wheel at 69. The function of this chain is to communicate pressure to the pouncer lever from the winding drum as follows: With the parts of the machine in the positions shown in Fig. 1, the several clutches being connected, the rotation of the shaft 42 in direction of the arrow, Figs. 5 and 6, will communicate motion to the winding drum, thereby winding the torsional spring 57 causing an increased pressure which will be conveyed to the pouncing head through the medium of the disk and chain which latter will be wound upon the disk. This pressure will obviously increase with the rotation of shaft

42 and the drum, by reason of connections as previously described, and the spring will tighten until the completion of the pouncing operation, when the arm 50 will engage the stud on the trip-lever 70, (see Fig. 4) thereby disengaging the latter from the notched disk 70^a of the shaft 66, when the said shaft will by means of a weight 71 secured thereto, rock back to its normal position as previously described. The connection of the lever 62 with cam 65 on shaft 66 will cause the disengagement of the clutch sleeve 60 from the winding drum, the release of the latter allowing the retraction of the before-mentioned spring 57. During this time the other clutch 43 44 on the same shaft is being opened by the connection of the rod 48 with the arm 47, whereby at the completion of each operation these parts become idle and the gear 41 revolves loosely upon its shaft 42. The function of the enlargement 56 on the disk 55 is to insure the retraction of the disk as the pouncing lever is raised on the beginning of the pouncing operation. It is necessary to provide for different heights of hats and yet retain the same relative tension for each, and it will be seen that when the lever is raised and the pad is placed on top of the hat, the weight upon the disk will be sufficient to take up any slack in the chain and maintain the winding drum 54 at a certain position with relation to the disk 55.

In order to prevent the shaft 42 from retraction at the moment of the disengagement of the clutch members, I have placed at one end of the shaft a friction clutch (Figs. 5 and 8) consisting of a housing 72 which is secured by a set-screw to the shaft, and a disk 73 fitting within the housing and having inclined notches on its periphery, forming between the disk and housing a series of recesses in which are arranged small rollers 75. The disk 73 is provided with a hub extending outward from the shaft and keyed to a stationary part of the framework 1, whereby the disk is fixed and the clutch just described will allow the shaft to revolve in one direction only.

Upon the main driving shaft 2 is loosely mounted a driving wheel 76 which is adapted to be locked to the shaft by a common form of friction clutch not shown in detail. The means for operating the slidable member 76^a of this clutch comprise a hand crank 77 secured to a rock shaft 78, said shaft being mounted in brackets 78^b of the frame and bears a cam 78^a the groove of which is engaged by a stud 79^a of one of said brackets 78^b. (See Fig. 15.) A vertical lever 79 pivoted to a stud of the frame connects this rock shaft with one end of a horizontal lever 90, the opposite end being pivoted to the machine at 90^a. Said lever 90 bears a stud 91 which is connected with the movable member of the clutch.

In order to operate the slides of the oval lathe and secure a proper adjustment of the same, I fasten upon the shaft 8 an adjustable cam 96 connected with a rack 95 which is, in turn, connected with a small pinion 94 on the rock shaft 93 journaled in suitable brackets of the framework, and upon this rock shaft is a grooved cam 92 engaging a pin upon one end of the lever 92^a; said lever being pivoted at 92^b to the machine and having its opposite end 92^c connected with the slide of the lathe.

It will be manifest from the foregoing that as the shaft turns, the connections described will cause the lathe to be thrown from its center at any predetermined time.

The feed shaft 8 is driven from the vertical shaft 7 at the top of which latter is a worm 100 which meshes with a worm gear 101 upon a horizontal shaft 102, the latter carrying at its outer end a worm 103 meshing with the gear 104 upon a short vertical shaft 105. The shaft 105 is provided at its upper end with a bevel pinion 106 meshing with the pinion 107 of the sleeve 108 on the feed shaft 8. Said sleeve is loose upon the shaft and is free to rotate thereon with a slow movement at such times when the remainder of the machine is in operation. Upon the inner end of this sleeve is formed one member 108^a of a clutch of which the other and slidable member 109 is splined to the shaft. (See Figs. 1 and 18.) It will be seen from this construction that the sleeve 108 can be running while the shaft 8 journaled therein may be idle, and that the slidable clutch member 109 is operated by reason of its lever connection 110 with a cam 111 upon the rock shaft 66, and further, that by said operation and engagement of the movable clutch member a slow rotary movement is imparted to the feed shaft 8, which in its travel carries with it the angle arm 21 and its connecting parts, including the pouncer head, together with the arm 50 and its operating connections. It will be understood that the rotary movement of the shaft 8 is but one quarter of a rotation, which is sufficient to move the pouncing head down from the tip to the brim of a hat.

The operation of the machine is as follows: The parts are in the position shown in Figs. 1 and 4, that is, the arms 50 and 21 are in a vertical position, thus holding the pouncing head upon the tip of the hat. Shaft 66 has been turned by the crank x and held by the trip lever 70, which turning has closed the clutch 108^a 109, through lever 110 and cam 111, and has closed the clutch 54—60, through lever 62 and cam 65. The vertical position of arm 50 necessitates closing of clutch 43—44 through cam 45^a, arm 47, rod 48 and crank 49. With the parts thus positioned, the machine is started by turning crank 77, Fig. 2, thus operating lever 79 from pin 79^a, and through said lever and intermediate devices closing the clutch 76—76^a. When the machine is thus started the main shaft rotates the lathe shaft 3 carrying the hat-block by the bevel gearing, the shaft 3, by worm 40, worm-wheel 41 and clutch 43—44, transmitting motion to shaft 42, which in turn, imparts motion to

drum 54 and disk 55, through the clutch member 60. The main-shaft also rotates shaft 7, through bevel gearing 5—6, which shaft 7 in turn imparts a slow rotating movement to shaft 8, through the worm and worm-wheel 100 and 101 and other intermediate gearing to the clutch 108^a—109. The shaft 7 also imparts rotary motion to the flexible shaft 19^b, through the friction wheels 10 and 11, shaft 12 and gearing to shaft 19, which latter is connected to said flexible shaft, the latter shaft being connected to shaft 36 which latter operates the pouncing head through bevel gearing. During the operation of the machine the pouncing head is rotated, and slowly carried from the tip of the hat, down along its side-crown in the direction of the arrow, Fig. 4; and combined with this movement, the head is given a movement laterally, or in a direction around the hat crown, as shown in Fig. 10. This latter movement is imparted by the cam 20, of arm 21 which carries the pouncing lever, engaging the stationary pin 20^b. As the pouncing head passes from the tip of the hat, down along its side-crown, the tension device on the pouncing lever will overcome the weight of the head, because such weight is longer exerted in a vertical plane, with the result that such head will fly away from the hat-body. To overcome this effect and to place an increased pressure on the side-crown where it is most needed, the mechanism shown in Fig. 5 is provided, and operates as follows: As soon as the devices above described are started to operate, the clutch-part 60 rotates the drum 54 slowly in the direction of the arrow, Fig. 5, gradually wrapping the spring 57 on the drum, the spring in turn rotating the disk 55 in the direction of arrow, Fig. 6, thus gradually winding chain 67 on the disk in the groove thereof, the chain passing over deflecting wheel 68 and connecting with the pouncing lever, as shown in Fig. 1. Manifestly, as the arm 50 moves in a direction opposite to the pull exerted by the drum on the chain, the latter will draw the pouncing head against the side-crown with a gradually increasing though yielding pressure. When the arm 50 has carried the pouncing head down to the base of the hat-crown, said arm strikes a pin on the tripping lever 70, the outer end of which, upon sufficient pressure, releases the shaft 66, which rocks back to its normal position through the medium of the weight 71. As the shaft 66 assumes its normal position, it causes, through the described mechanism the opening of the clutches 60—54 and 108^a—109, thus stopping rotation of shaft 8 and releasing the drum. The tripping of lever 70 is the signal for the operator to reverse the motion of the shaft 78 by crank 77 and thus stop the machine. It will be observed that the downward movement of arm 50 gradually elevates rod 48, the collars on which allow, according to adjustment, a predetermined movement without affecting the sleeve 46. Eventually, however, the lower collar operates on arm 47 and lifts the same, turning the sleeve 45 carrying the cam groove 45^a, until, as the arm 50 reaches its lower limit, the cam groove 45^a and pin 46^a have caused the retraction of the clutch-member 44, thus stopping shaft 42. The spring-drum flies back to its normal position and unwinds the chain from disk 55, thus releasing the pouncing lever of pressure. The counterbalancing device on the lever causes the latter to carry its head away from the hat, and the weight 51, at the lower end of rod 48, exerts a pull to return arm 50 to its vertical position. The same movement of rod 48 causes the upper collar 48^b to act on arm 47 and force it to its lowest position, which movement, through the described means again closes the clutch 43—44 in readiness for operation. Weight 56 takes up any slack in chain 67 which may occur after the parts have assumed their normal inoperative position; and the gravity of the pouncing head reasserts itself, as the arm 50 assumes its vertical position, and is counterbalanced by the tension device carried by the pouncing lever.

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

1. In a hat pouncing machine, the combination with a rotary lathe, of a rotary pouncer head and automatic means for moving the head from the tip to the brim in a single oblique straight line over the surface of the hat; substantially as described.

2. A hat pouncing machine comprising a rotary lathe, a rotary pouncer head, a lever carrying said head, and two independent sets of mechanism acting simultaneously upon said lever to impart to said head a progressive movement in an oblique line relative to the lathe; substantially as described.

3. A hat pouncing machine comprising a rotary lathe, a rock shaft, an angle arm connected to said shaft so as to rock therewith, means for reciprocating said arm on said shaft, a lever pivoted to said angle arm, a pouncer head carried by said lever, and means for rotating said head and operating said shaft; substantially as described.

4. The combination with a rotary lathe of a hat pouncing machine, of a rotary and obliquely movable pouncer head, and means for operating the same comprising an adjusting device whereby the speed of said head on its axis may be varied; substantially as described.

5. The combination with a rotary lathe, of an angle arm, a cam attached thereto, a bracket and stationary pin to engage said cam, a feed shaft upon which said cam is slidably mounted and axially fixed, with means for operating said feed shaft, and a pouncer lever carried by and adjustable upon the angle arm; substantially as described.

6. A hat pouncing machine comprising a head, and a feed shaft and mechanism for operating the head including an angle arm slidably mounted and axially fixed on the feed

shaft, a slide block fitted in a slot of the arm, a pouncer lever hinged thereto, an adjustable mechanism interposed between the lever and arm whereby the weight of the arm is counterbalanced, all substantially as described.

7. A hat pouncing machine comprising a feed shaft, an angle arm slidably mounted and axially fixed thereon, a slide block fitted into a slot of the arm, a pouncer lever hinged thereto, a bracket secured to the arm, an operating lever pivotally connected with said bracket and with the hub of the pouncing lever and means to adjust the operating lever so as to vertically adjust the pouncer lever; substantially as described.

8. In a hat pouncing machine, the combination with a pouncer head, of a driven shaft 7 carrying a disk, operative connection between said disk and said head comprising a friction wheel engaging with said disk, a slide carrying the friction wheel provided with an attached rod, and an operating lever whereby the positions of the slide and wheel are changed with relation to the disk; substantially as described.

9. The combination with the main shaft, of the lathe shaft operated thereby and having a worm secured thereto, a longitudinal shaft 42 carrying a loose gear operated by said worm and having a clutch face, an opposing clutch member 44 splined upon the longitudinal shaft, a sleeve connected with said member 44, a cam carried by the sleeve of the movable clutch member and engaging a stationary pin, and mechanism for shifting said sleeve and clutch member; substantially as described.

10. The combination with a rotary lathe, and means for actuating the same, of a pivotally supported pouncer-lever provided with a socketed base, a pouncer-head provided with a shank supported by said base, a yielding connection between said base and head, and means for rotating said head partially supported by said lever and partially by said head; substantially as described.

11. The combination with a rotary lathe, of a pouncing lever having a base to receive the shank of a pouncer head, and provided with a collar the pouncer head mounted in said base and provided with a stud, a spring coiled upon the lever base and having one end secured to the said stud and the other end connected to the collar, and means for operating the pouncer head; substantially as described.

12. The combination with a pouncing lever carrying a pouncing head, of a shaft to which said lever is hinged and provided with a ratchet, a lever 33 journaled upon the shaft a spring actuated slide mounted upon the lever and provided with a lug to engage the ratchet, a torsional spring connecting the lever to a collar upon the pouncing lever, and means for operating the pouncer head partially carried by the lever; substantially as described.

13. A hat pouncing machine comprising a pouncer lever carrying a pouncing head, a shaft 42 and means for driving the same, a disk and drum loosely mounted thereon, a chain connecting said disk with the pouncer lever, a spring coiled upon the drum and connecting the same with the disk, and mechanism for connecting the drum with the shaft; substantially as described.

14. A hat pouncing machine comprising a pouncer lever, a shaft 42 carrying a clutch member 60, means for actuating said shaft a sleeve upon the hub of said clutch, a rock shaft 66 carrying a cam, a sleeve surrounding said cam, a lever connecting the sleeve of the cam with the sleeve of the hub of said clutch member, a winding drum carrying the other member of the clutch, a disk carried by the shaft 42, means for connecting the drum and the disk, and a chain connecting the disk with the pouncer lever; substantially as described.

15. The combination, in a hat pouncing machine, with a lathe and means for rotating the same, of a pivotally supported pouncer lever carrying a pouncer head, means for actuating the said lever and head, and tension mechanism co-operating with the pouncer lever to exert a constantly increasing but yielding pressure upon said lever; substantially as described.

16. The combination, in a hat pouncing machine, with a lathe and means for rotating the same, of a pivotally supported pouncer lever carrying a pouncer head, means for actuating the said lever and head, means carried by said lever for counterbalancing said head, and tension mechanism co-operating with the pouncer lever to exert a constantly increasing but yielding pressure upon said lever; substantially as described.

17. The combination, in a hat pouncing machine, with a lathe and means for rotating the same, of a pivotally supported pouncer lever carrying a pouncer head, means for actuating said lever and head, adjustable counterbalancing mechanism carried by said lever, and tension mechanism co-operating with the pouncer lever to exert a constantly increasing but yielding pressure upon said lever; substantially as described.

18. The combination, in a hat pouncing machine, with a lathe and means for rotating the same, of a pouncer lever carrying a pouncer head, a longitudinally and circularly moving mechanism carrying and actuating said lever, means co-operating with said lever for exerting a constantly increasing but yielding pressure upon said lever during its operation, and means for actuating said head; substantially as described.

19. A hat pouncing machine comprising a lathe, a pouncing lever, a pouncer head carried by said lever, a shaft 42 with means for operating the same, a sleeve 52 mounted on said shaft, a drum carried by said sleeve, a spring fitting a peripheral groove in the drum and secured at one end to the latter and the opposite end to a disk, said disk mounted upon

the shaft and flexibly connected to the pouncer lever, and a weight carried by said disk; substantially as described.

20. A hat pouncing machine comprising a driving shaft, a pouncing lever with operating connections between the two, a driving wheel 76 mounted upon said shaft and having a clutch face, a slidable clutch member 76^a carried by the shaft, a lever 79 with operative connections between it and the slidable clutch member, a rock shaft provided with an operating handle, and operative connections between the rock shaft and the lever 79, a cam on the rock shaft and a fixed pin co-operating therewith whereby the movement of the machine is controlled; substantially as described.

21. The combination with a lathe having a slide and a lever connected therewith, of a shaft 93 mounted in the frame-work, a cam on said shaft, a pinion carried by said shaft, a rack engaging said pinion, a feed shaft, an adjustable cam carried by the feed shaft and connected to the rack, and a pouncing lever with suitable driving connections; substantially as described.

Signed at Danbury, in the county of Fairfield and State of Connecticut, this 9th day of October, A. D. 1893.

JOHN B. HOWE.

Witnesses:
C. M. NEWMAN,
NELLIE FARREN.