

(No Model.)

2 Sheets—Sheet 1.

W. S. FITZGERALD.

BOOT AND SHOE NAILING MACHINE.

No. 324,312.

Patented Aug. 11, 1885.

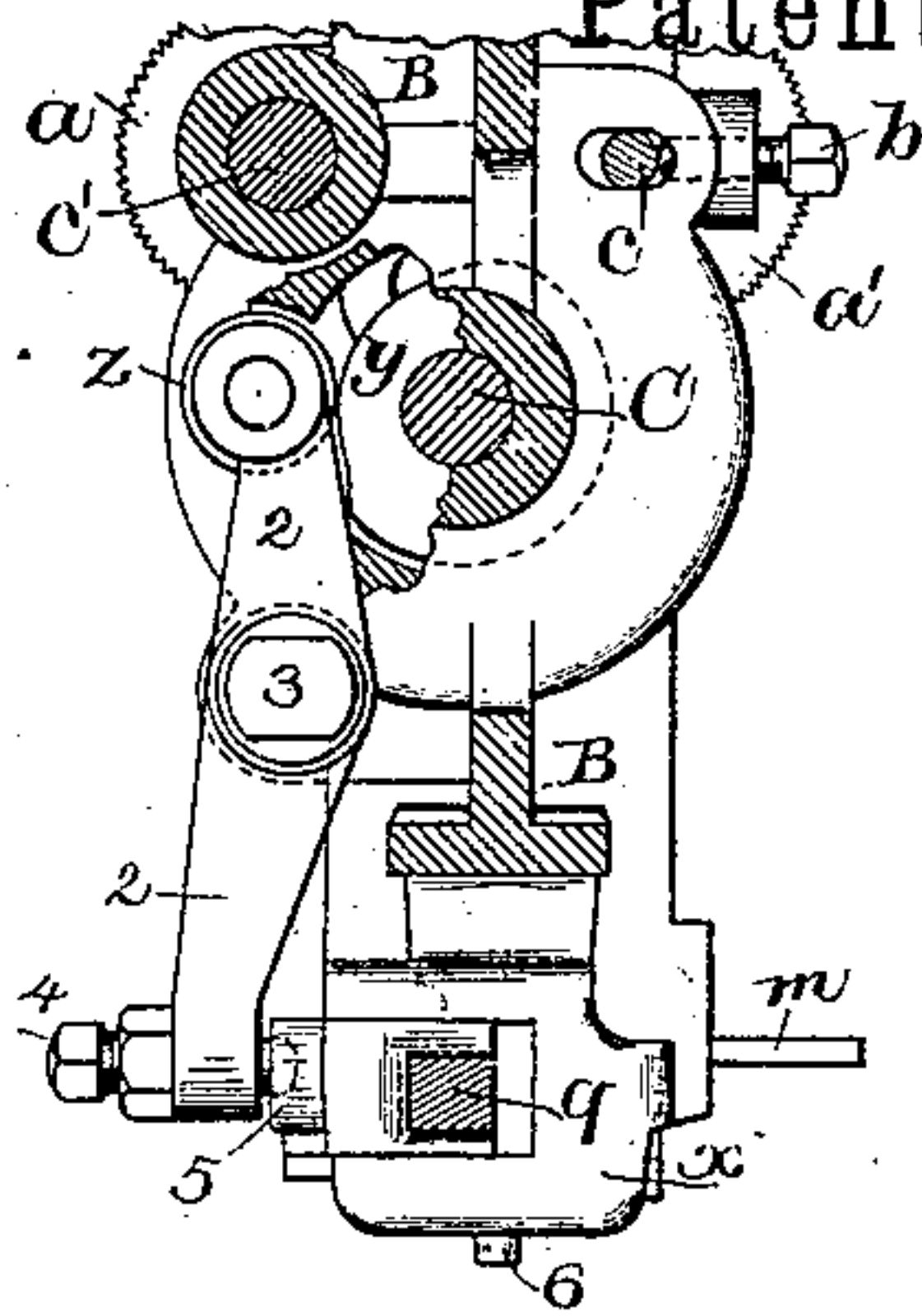


Fig. 5.

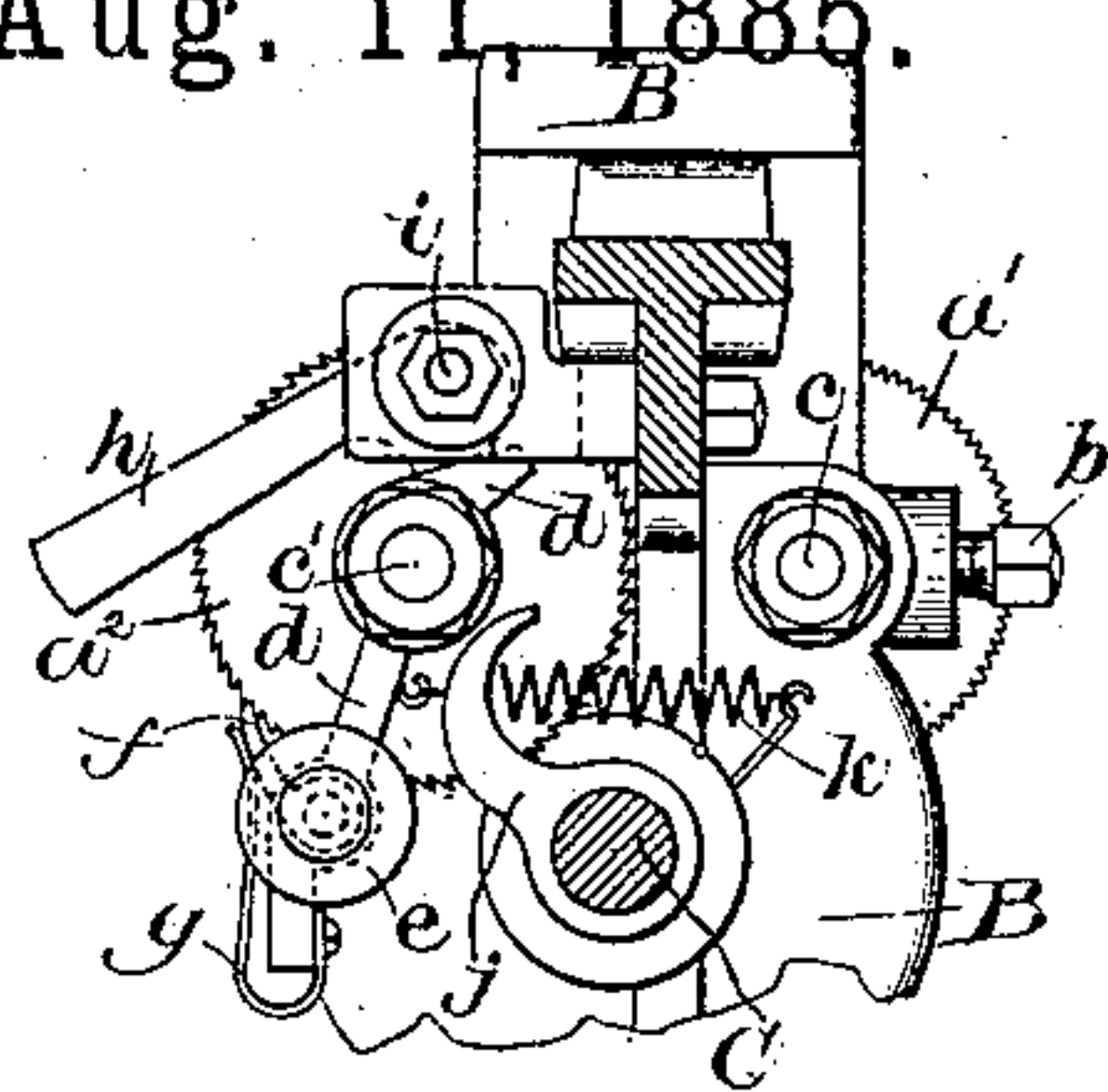


Fig. 4.

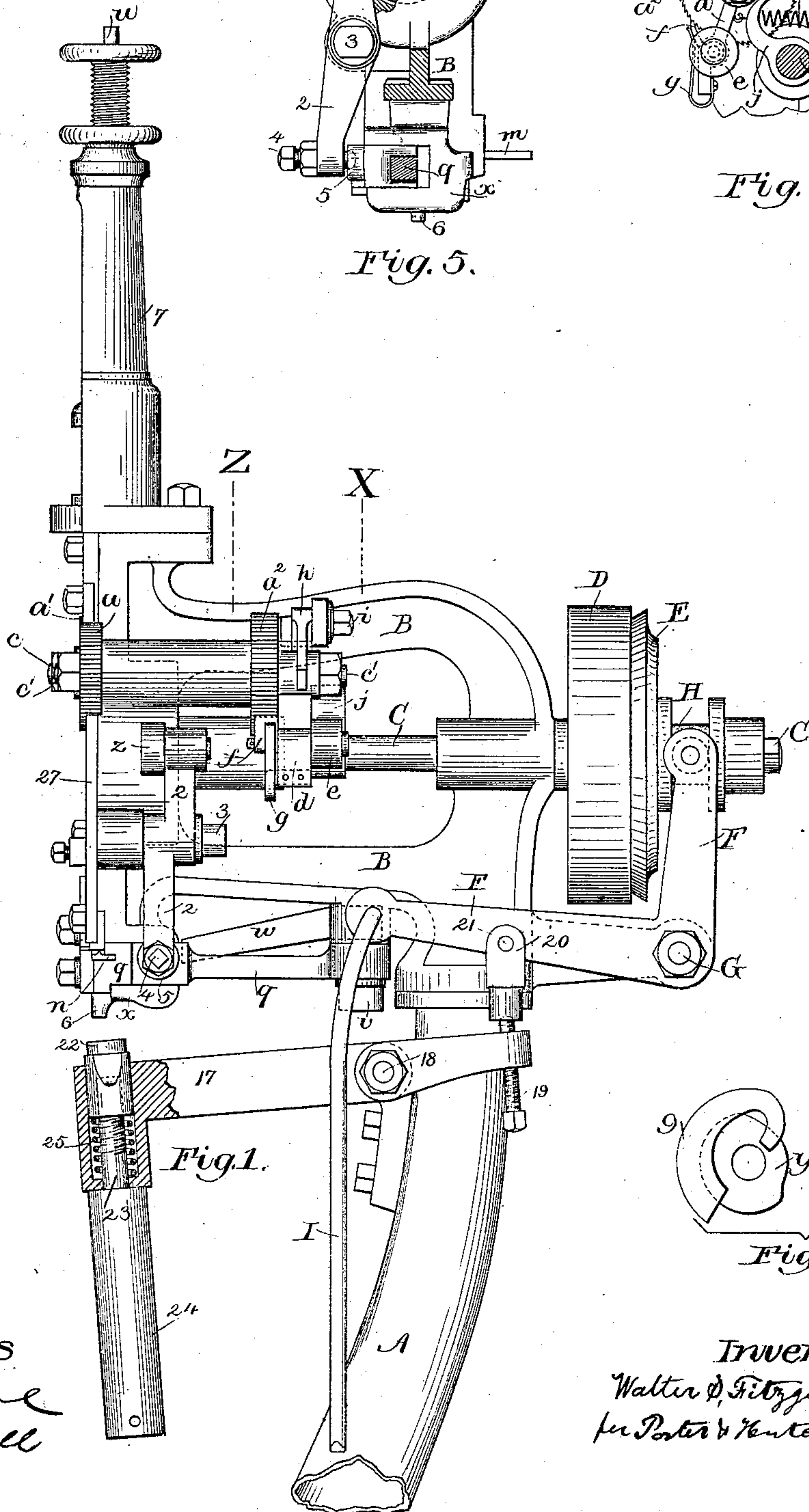


Fig. 1.

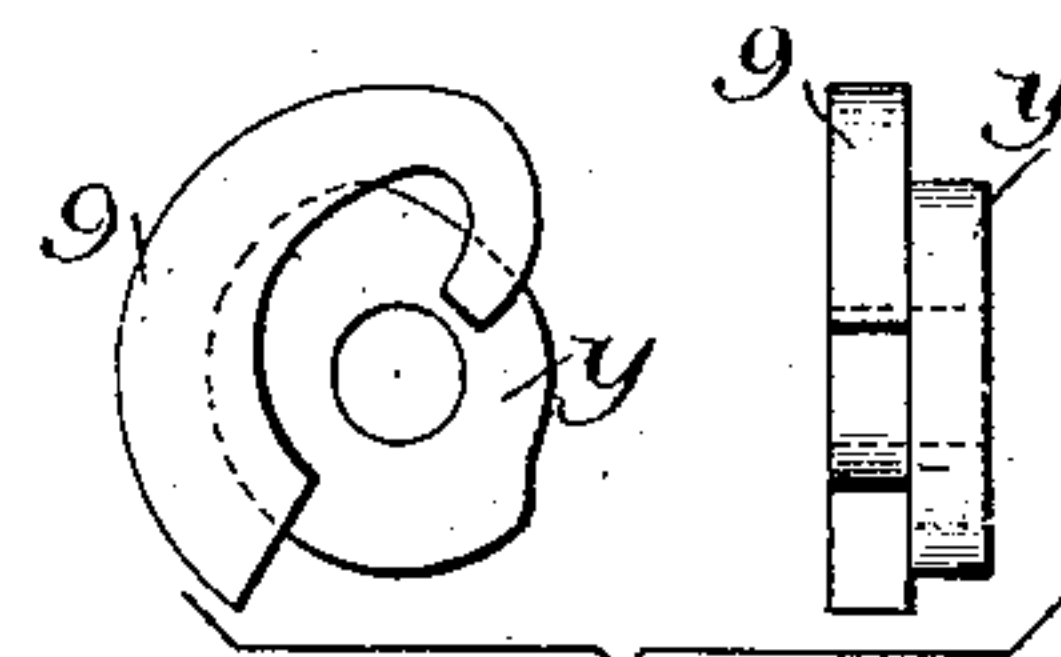


Fig. 6.

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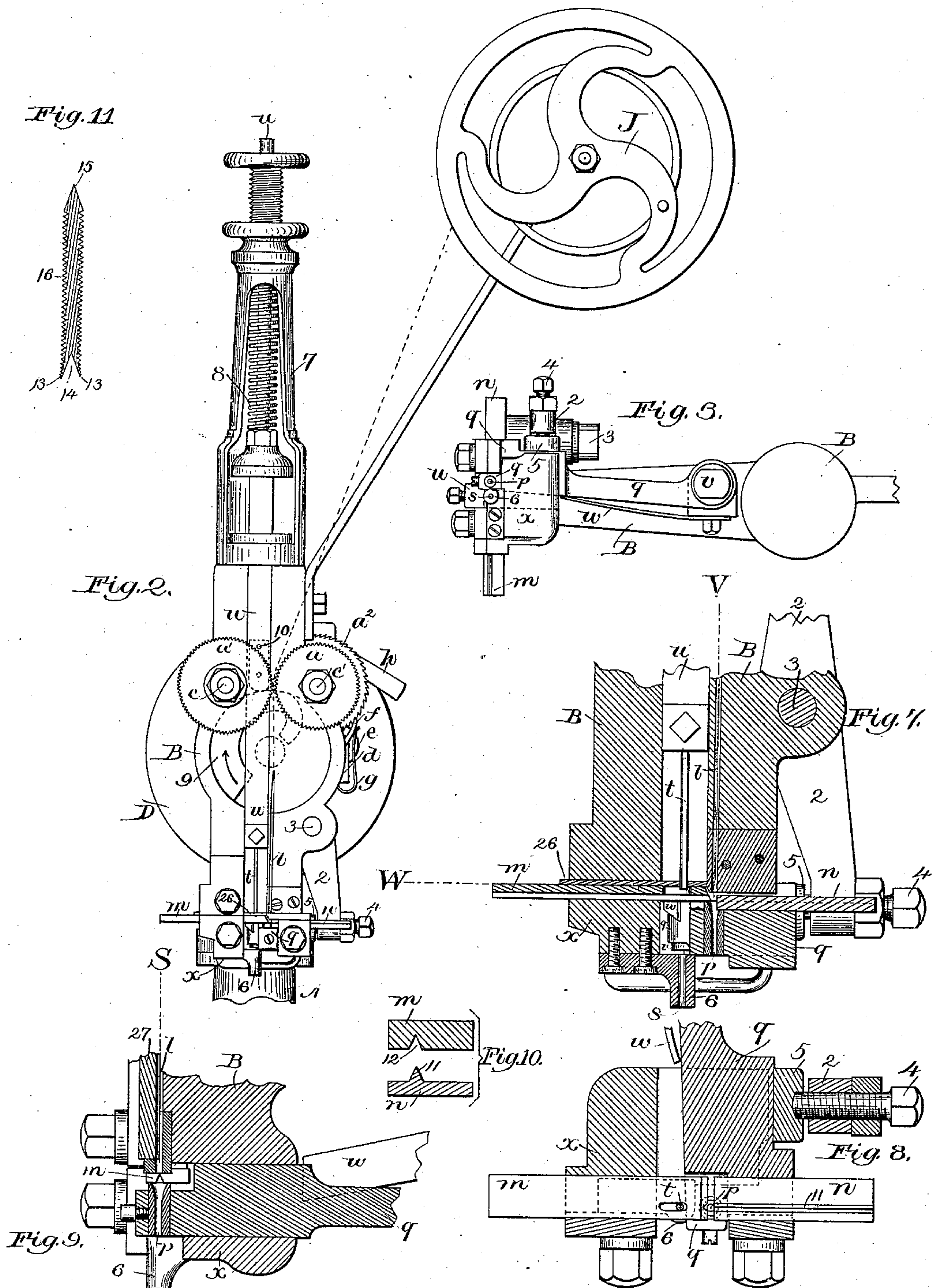
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UNITED STATES PATENT OFFICE.

WALTER S. FITZGERALD, OF BOSTON, MASSACHUSETTS.

BOOT AND SHOE NAILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 324,312, dated August 11, 1885.

Application filed March 23, 1885. (No model.)

To all whom it may concern:

Be it known that I, WALTER S. FITZGERALD, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Boot and Shoe Nailing Machines, which will, in connection with the accompanying drawings, be hereinafter fully described, and specifically defined in the appended claims.

10 This invention has for its object certain improvements in that class of nailing-machines which form the nail as it is required for driving into the leather, a coil of wire mounted upon a reel being arranged to be automatically fed into the machine to the requisite extent to form a nail as each nail is driven, the nail being automatically formed after such feeding forward of the wire and before being driven, as will, in connection with the accompanying drawings, be hereinafter fully described and definitely claimed.

20 In said drawings, Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a front elevation of the same, it being taken as viewed from the left in Fig. 1, but with the front plate, 27, removed. Fig. 3 is a detached under side plan view of the wire-cutting devices. Fig. 4 is a detached vertical sectional elevation, the section being taken as on line X, Fig. 1, and the view being as from the right therein. Fig. 5 is similar to Fig. 4, but with the section taken on line Z, Fig. 1. Fig. 6 gives an edge and side elevation of the cams by which the bar of the nail-driver and the nail-cutter are respectively actuated. Fig. 7 is a detached vertical section taken as on line S, Fig. 9, and longitudinally through the wire-separating cutters, and as viewed from the left in said Fig. 7. Fig. 8 is a detached horizontal section taken as on line W, Fig. 7, and showing the wire-cutters in plan. Fig. 9 is a detached vertical section taken as on line V, Fig. 7, and as viewed from the right therein. Fig. 10 is a transverse vertical section through the cutters that sever the wire and form the nail, they being shown in their proper relative positions, except that they are somewhat separated instead of being close together, as when in use. Fig. 11 is an enlarged side elevation of the nail formed in my machine.

In said views A represents the upper portion of the supporting-standard of the machine. B is the frame, mounted on A. C is the arbor; D, the driving-pulley loosely mounted on arbor C. E is a clutch interlocked by a spline with C, but sliding freely thereon to engage and lock the pulley by means of angle-lever F, pivoted at G, and engaging hub H of clutch E by trundles that enter the concentric groove of the hub, said angle-lever being actuated by a treadle with which rod I, depending from lever F, is connected. By means of these well-known devices an intermittent rotary movement can be imparted to said arbor C, according as the treadle connected with rod I is depressed or liberated.

The coil of wire to be utilized for nails is arranged upon reel J, whence it extends to and passes between the toothed crimping and feeding wheels a a' , pivotally supported in frame B, said wheel a having an axis or pivotal support fixed in position, while wheel a' is adjustable toward or from wheel a to conform to the various sizes of wire employed, such adjustment being effected by means of set-screw b , Figs. 4, 5, which acts against arbor c of said wheel.

The extent of downfeed upon the wire by means of wheels a a' is regulated by means of the following devices, acting in conjunction with wheel a^2 , mounted on the rear end of the arbor of wheel a , while wheel a' only moves coincidentally with wheel a by reason of contact with the advancing wire: A lever, d , is rigidly secured on pivot c' of wheel a . (See Fig. 4.) The arm of this lever that extends above arbor c' is arrested by the lever-cam h , pivoted at i and controlled in the desired position by the friction resulting from its securing-nut on its pivot. In the lower end of lever d is pivoted the trundle e , on whose axis is pivotally mounted the pawl f , which is held in contact with wheel a^2 by bow-spring g . A cam, j , secured on arbor C, engages trundle e in the lower end of lever d , and at every revolution of arbor C moves said lever outward to the same point, but by adjusting lever-cam h on its pivot i the extent of return movement of lever d after its release by cam j is controlled as desired, and thereby the extent of rotation imparted to wheel a^2 by pawl f , carried by lever d , as

above stated, is controlled to give the extent of downfeed to the wire between wheels a a' that will produce a nail of the required length.

A spring, k , serves to return lever d after it has been moved outward by cam j . The wire thus fed downward passes through passage l in the head of the machine and between the cutters m n into passage p in the vibrating jaw q , when it is severed by the cutters, and the portion in jaw q , which constitutes the nail, is, by the action of said jaw, carried under driver t , which is carried by bar u , and is then driven through passage s into the leather.

The devices by which these several movements are effected are described as follows: Said jaw q , which carries cutter n , is pivoted at v to head B, and is engaged by spring w , which tends constantly to force it outward or away from fixed jaw x , which supports cutter m ; but said jaw q is at every revolution of arbor C forced inward to cut the wire by the action of cam y , Fig. 5, secured on arbor C, and which acts against trundle z , pivoted to the top of lever 2, which vibrates on stud 3 and carries at its lower end an adjustable screw, 4, seated in a saddle, 5, which bears against said jaw q , the action of spring w serving to constantly press said jaw against the saddle, yet allowing the jaw to be forced inward by said devices.

When the wire has, after each operation of the machine passed from passage l above cutters m n into passage p below said cutters the distance required for the nail, by means of the feed-wheels a a' , then jaw q is forced inward by means as stated till the wire has been severed by said cutters, and is held in passage p by the frictional contact resulting from its serrated or crimped condition, caused by the action of wheels a a' , and is carried forward till said passage p is coincident with passage s in throat 6, when the driver t is liberated, and by the rapidity of its descent, by means to be described, drives the nail into the leather, when cam y releases arm 2 and allows spring w to open or swing jaw q outward to separate the wire-cutters. Said driver t is secured in bar u , which slides in bearings in head B and spring-post 7, and is provided with a helical spring, 8, which is compressed by the rising of the bar, and by its expansion forces it down, when liberated, with such velocity as to drive the nail by the action of driver t .

At the top of spring-post 7 are set-collars and nuts by which to adjust the compression of said spring. Said bar, spring, and adjustment are common and well known in the art. Said bar is raised by the action of cam 9, carried by arbor C, which acts against shoulder 10, secured upon said bar. (See Figs. 1, 6.) Said cutting-bar m is formed with a longitudinal groove, 12, while bar n has a corresponding ridge, 11, which fills said groove 12 when bar n slides beneath bar m in the act of cutting the wire and carrying the nail over

passage s preparatory to driving it, as specified above.

By reason of the described construction of cutters m n the lower end of the nail 16 is forked, as at 13 13, Fig. 11, thus forming an acute retiring angle, 14, whereby said forks, when driven through the leather, will by their contact with the anvil be diverged and clinched into the bottom piece of the parts of leather being secured together by the nail. The apex 15 of the nail receives the blow of the driver when it descends.

An opening (shown in Fig. 8) is formed in cutter m for the passage of driver t , as there shown, while a cap, 26, seated on m and having a round hole, serves as a guide and lateral support of driver t .

For the purpose of supporting the leather while driving the nails therein, a lever, 17, is pivoted at 18, and in its rear arm is threaded an adjusting-screw, 19, which bears against stop 20, pivoted at 21 on angle-lever F, said stop 20 being readily swung to the rear to allow the front or longer arm of lever 17 to fall entirely out of the way of throat 6, if for any reason desired. The anvil 22 is seated in the front socketed end of lever 17, and is threaded to be vertically adjustable upon stem 23 of body 24, and it is sustained by a coiled spring, 25, seated and supported in the socket of lever 17, and bears against the under face of the anvil. By means of these devices the anvil 22 is forced up against the leather, which is interposed between the anvil and throat 6, by the action of the treadle upon angle-lever F through rod I, which, by depressing the long arm of lever F, forces down the stop 20, thereby elevating the anvil as the clutch and pulley are engaged, the yielding of spring 25 compensating for local variations in the thickness of the leather, while by adjusting-screw 19 a general adjustment is made for different thicknesses of leather of a general nature, the adjustment of the anvil on stem 23 serving as the means of regulating the resisting force of sustaining-spring 25.

I claim as my invention—

1. The combination of supporting-arm 17, body 24, its stem 23, anvil 22, threaded on said stem, and cushioning-spring 25, mounted on said stem and arranged to exert its force between said arm and anvil, substantially as specified.

2. In a boot and shoe nailing machine, the combination, with the pivotal anvil-supporting arm with its adjusting-screw 19, of stop 20, pivoted to angle-lever F, actuated through the treadle-rod, substantially as specified.

3. In combination with a duly organized nailing-machine, the cutters m n , the former having the longitudinal groove 12 and the latter the corresponding raised groove, 11, substantially as specified.

4. In a boot and shoe nailing machine, the combination, with the wire feeding and crimping wheels a a' , of toothed wheel a'' , mounted on the axis of one of said feeding-wheels, le-

ver *d*, with a controlling-cam and carrying trundle *e*, pawl *f* and its engaging spring, and the actuating-cam *j*, arranged to engage trundle *e*, all substantially as specified.

5 5. In a boot and shoe nailing machine, the combination, with pivotal jaw *q*, of lever 2, with its roller *z*, cam *y*, and adjusting screw arranged to engage said lever with said jaw, all substantially as specified.

10 6. In a boot and shoe nailing machine, the combination, with vibrating feed-lever *d*, of an adjustable frictionally-retained lever-cam, *h*, arranged to regulate the extent of return movement of said feed-lever when it is liberated from its actuating-cam, substantially as specified.

15 7. In a nailing-machine, the combination, with stationary cutter *m*, of cutter *n* and a reciprocating holder arranged to move in a

straight horizontal path parallel with the plane 20 of cutter *m*, substantially as specified.

8. In a boot and shoe nailing machine, the combination of the anvil mounted on a pivotal support, the clutch-actuating lever, and connecting devices, whereby said anvil-support is 25 actuated to raise the anvil by the movement of the clutch-actuating lever, substantially as specified.

9. The combination, with cutter *m*, formed with a longitudinal opening for the passage of 30 the nail-driver *t*, of cap 26, secured on said cutter and formed with a passage to admit and laterally support the driver, substantially as specified.

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