

No. 630,554.

Patented Aug. 8, 1899.

F. A. NEIDER.

MACHINE FOR SECURING SHANKS TO CARRIAGE CURTAIN KNOBS.

(Application filed May 16, 1893.)

(No Model.)

3 Sheets—Sheet 1.

Fig 1

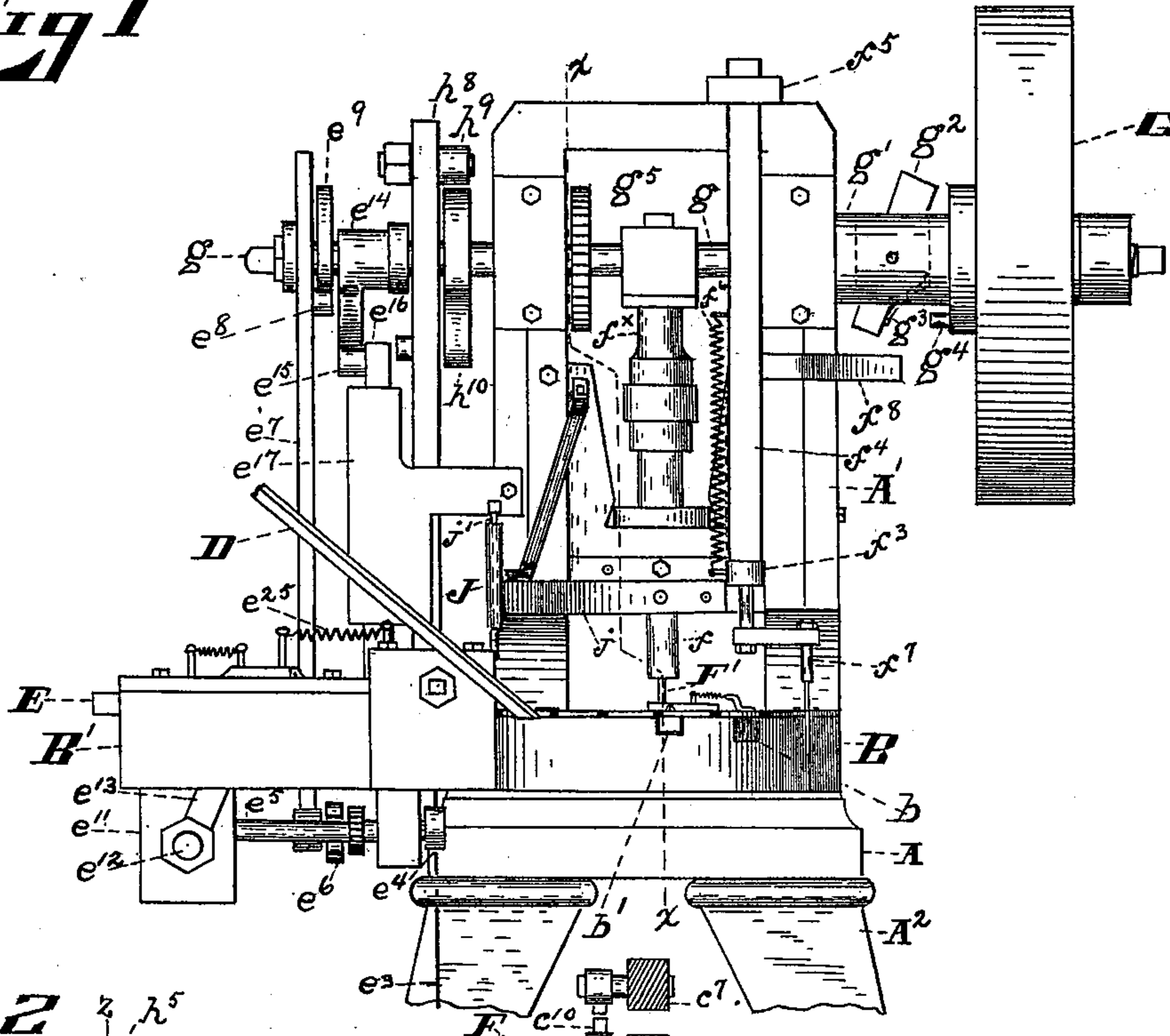
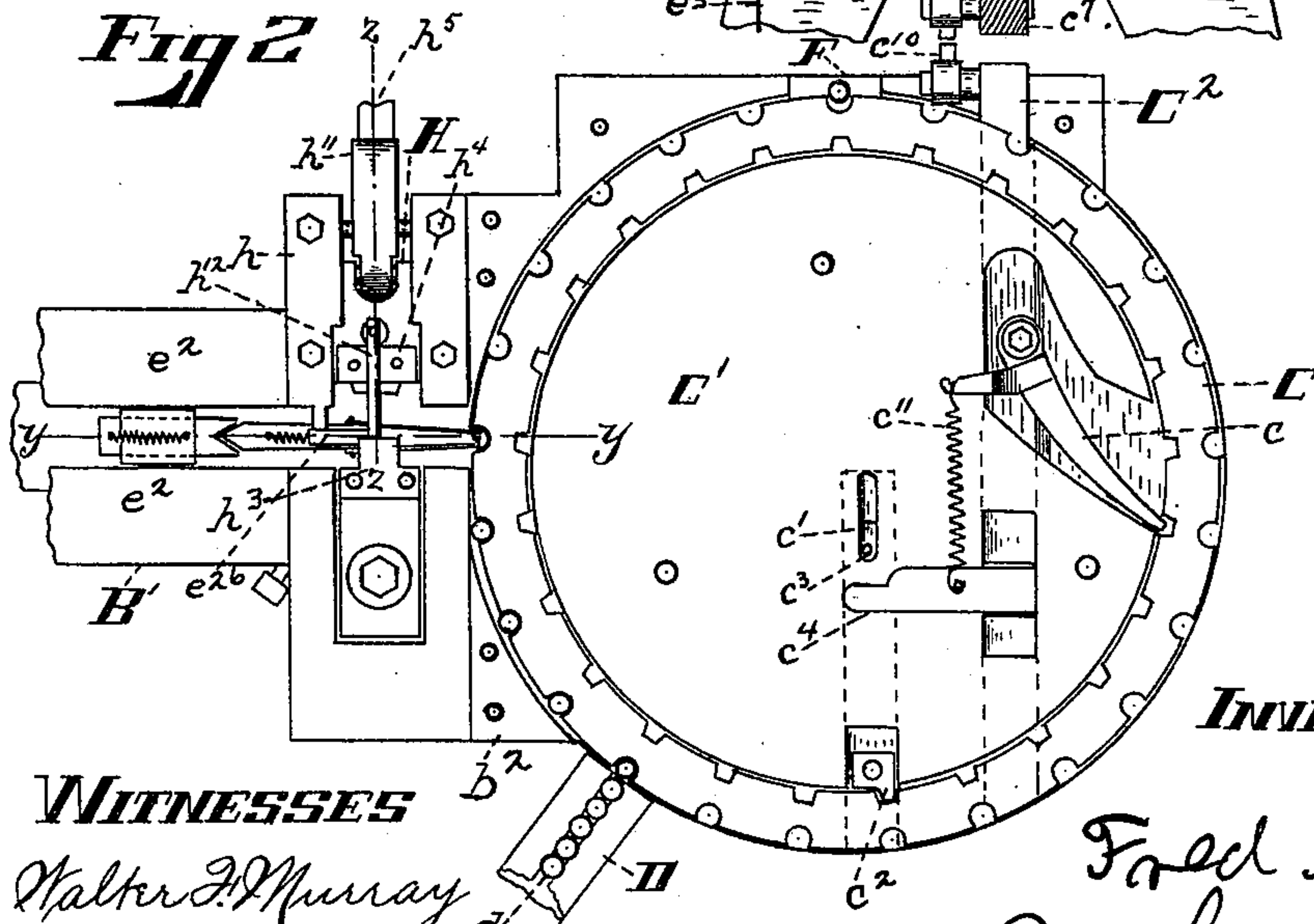


Fig 2



WITNESSES

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Fig 3

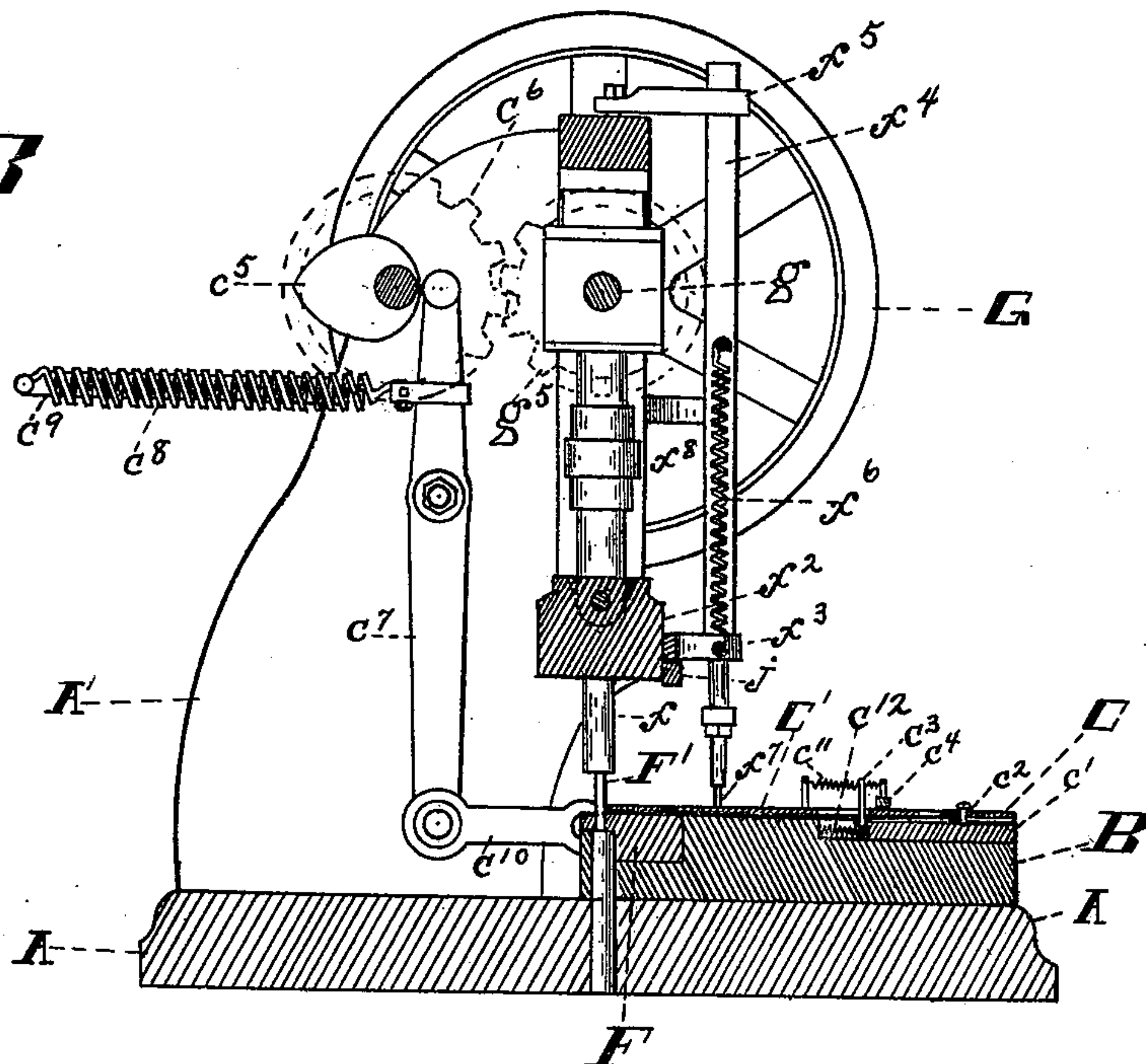
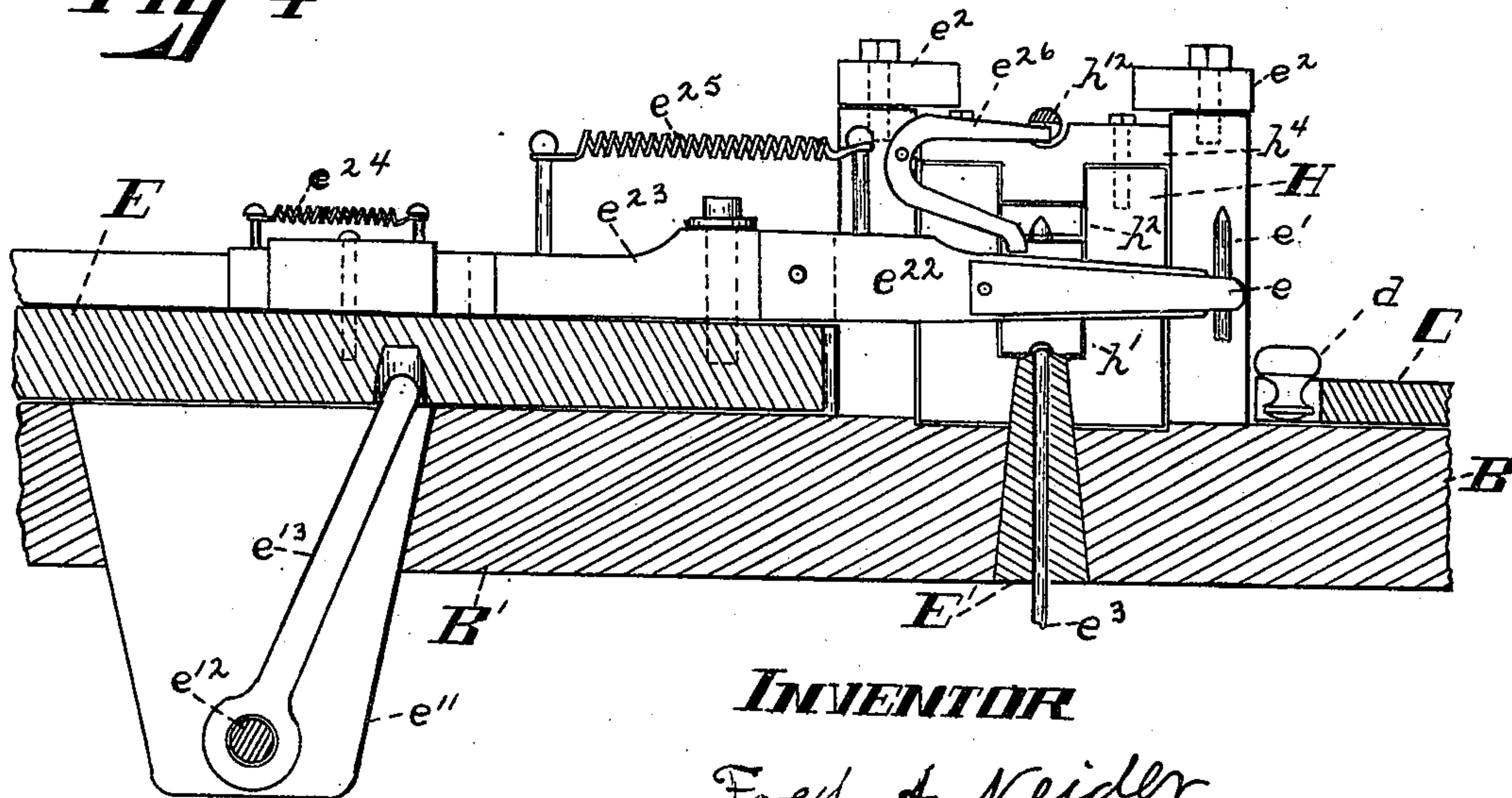


Fig 4



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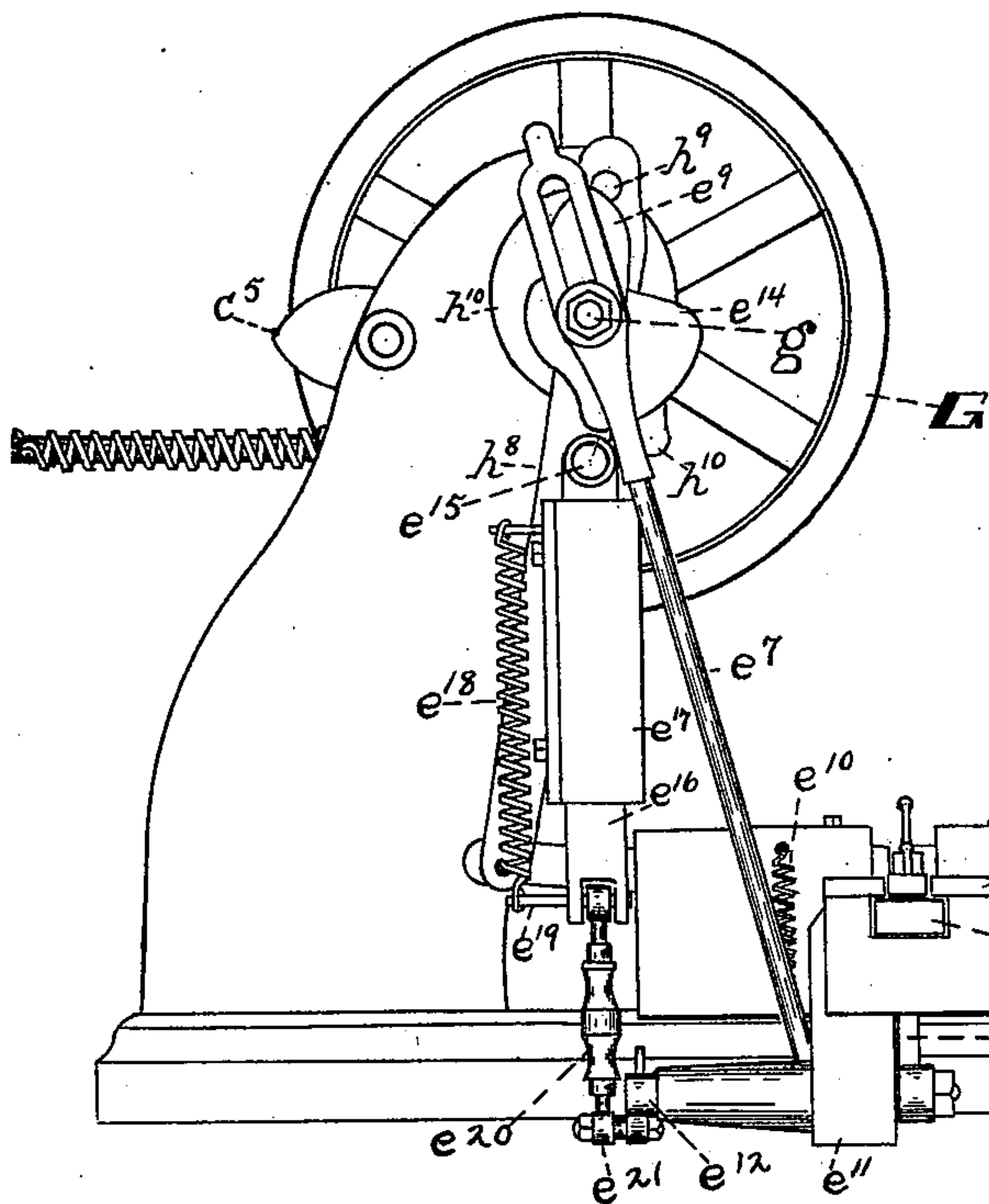


Fig 5

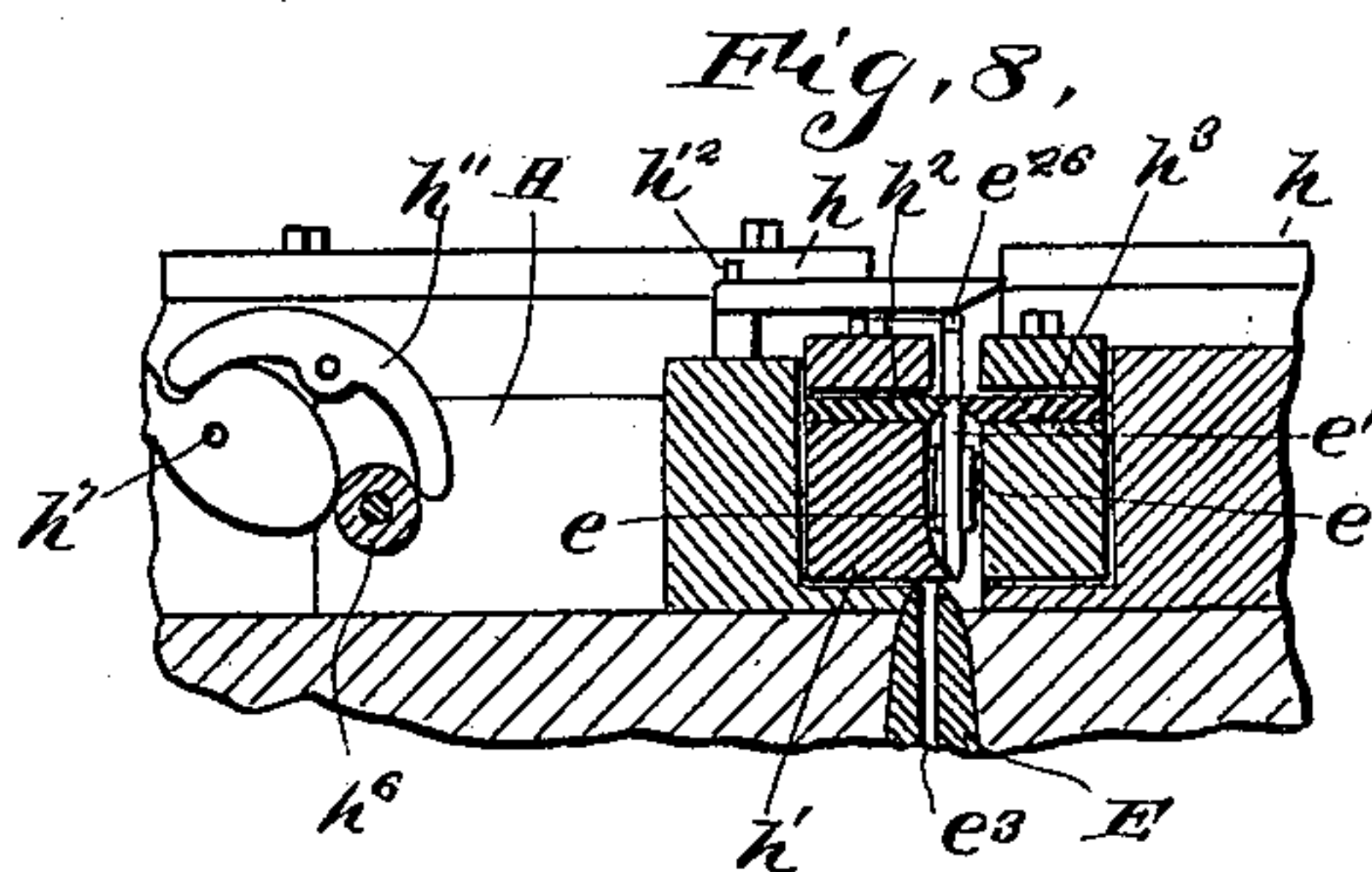
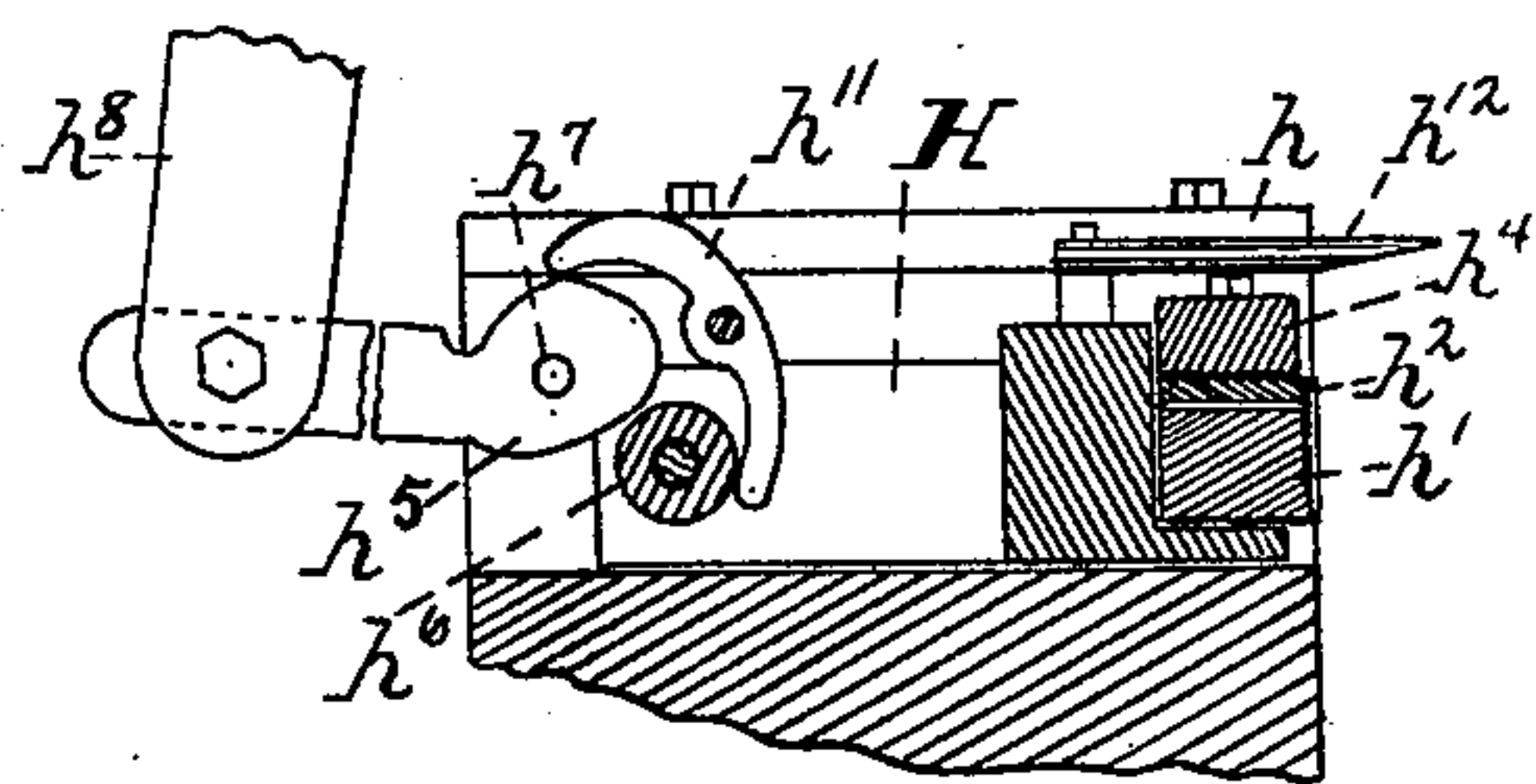


Fig 8

Fig 7

Fig 6



UNITED STATES PATENT OFFICE.

FRED A. NEIDER, OF AUGUSTA, KENTUCKY.

MACHINE FOR SECURING SHANKS TO CARRIAGE-CURTAIN KNOBS.

SPECIFICATION forming part of Letters Patent No. 630,554, dated August 8, 1899.

Application filed May 16, 1898. Serial No. 680,773. (No model.)

To all whom it may concern:

Be it known that I, FRED A. NEIDER, a citizen of the United States, and a resident of Augusta, in the county of Bracken and State of Kentucky, have invented certain new and useful Improvements in Machines for Securing Shanks to Wrought-Metal Carriage-Curtain Knobs, of which the following is a specification.

10 The object of my invention is to provide means by which the shank is rapidly secured in the head of a wrought-metal carriage-curtain knob and the head given its final form by the same operation which secures the shank in place. Its object is also to automatically sever the shanks from the coil of wire, automatically feed the blank heads to a carrier which conveys said blanks to receive the shanks which are automatically placed in 15 them, automatically feed the blanks containing the shank to the finishing-die, and automatically swage the neck and collar of the blank firmly on the shank, completing the knob, and discharging it from the machine. 20 These objects I attain by the means illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of a machine embodying my invention. Fig. 2 is a detail 30 plan view, upon an enlarged scale, of the mechanism for automatically feeding the head-blanks to the carrier, severing the shank and conveying it to the carrier, and the means for actuating the carrier to convey the blanks from the delivery-chute to the finishing-die. Fig. 3 is a transverse sectional view taken 35 through the irregular line *xx* of Fig. 1. Fig. 4 is a detail view, upon a greatly-enlarged scale, taken in central vertical longitudinal section on line *yy* of Fig. 2, showing the mechanism for cutting the shank and carrying it forward to the head-blank and placing it in position in the blank. Fig. 5 is an end 40 elevation of the machine. Fig. 6 is an enlarged sectional detail view of the cutting-knife and means for operating it, the view being taken through line *zz* of Fig. 2. Fig. 7 is an enlarged detail view in diametrical section of the swaging and finishing die. 45 Fig. 8 is a view similar to Fig. 6, showing the cutting-knife at the end of its forward stroke,

the stationary die, and the spring-fingers for holding the shank.

Referring to the parts, which are indicated by similar reference-letters wherever they occur throughout the various views, the body 55 of the machine consists of a bed-plate A, having uprights A', in which the power-transmitting mechanism is mounted, the uprights being suitably braced apart and the whole 60 preferably cast in a single piece and supported on legs A². The above parts do not differ materially from the ordinary die or punching press and need not, therefore, be more specifically described. 65

On the base A is secured a casting B, the front and one side of which are circular and have a lateral projection B', upon which is mounted the device for severing the shank from the coil of wire and feeding the shank 70 forward after it is severed into the perforation in the knob-head. The rear of this bed-plate at one side also projects beyond the arc of the circle to receive plates to retain the knobs in place while being carried from the 75 shank-feeder to the final finishing-die. The top of the plate or casting is planed off true to seat a notched ring C, which is retained in position and guided in its circular path by a circular plate C', which is secured on top of 80 the casting B. The casting has a transverse groove *b* planed through it to seat a sliding bar C², which carries the pawl *c*, by which the ring C is intermittently rotated. The casting B is also grooved at *b'* to seat a sliding 85 bar *c'*, which locks the ring in place by means of a detent *c²*, secured upon top of the bar and engaging one of the notches in the inner rim of the ring C. These bars C² and *c'* are held in place by the disk C', which is cut 90 away to permit free play of the pawl *c* and its attachments and the locking-detent and grooved to permit play of the pin *c³*, by which the detent is disengaged from the notch by an arm *c⁴*, which is secured upon the bar C² and 95 projects over the disk C' to engage said pin when the pawl is retracted to take a new bite in one of the notches in the inner edge of the ring C.

The outer edge of the ring C has semicircular notches opposite the notches in the inner edge of the rim to receive the blank knob- 100

heads d , which are fed to it through a chute D from a hopper. (Not shown.) At each stroke of the bar C^2 , which in Fig. 2 is represented at the lower limit of its stroke, the ring C is rotated the distance of one notch, and the knob-heads after they leave the edge of the chute are kept in place by the plate b^2 until they come opposite the fingers e , which carry the severed shank e' over the perforation in the knob-head, and after the shank has been inserted in the knob-head the knobs are still kept in position by the plates b^3 until they are carried around and deposited in the mouth of the finishing-die F, through which it is forced by the plunger F' , which is secured in the holder f , which holder is secured in the reciprocating head f^2 of the press. It being understood that at each forward stroke of the bar C^2 the ring C is moved the distance of one notch and locked in place, a knob-head fed into the outer notch opposite the chute D, a shank severed from a wire coil and placed in a knob-head opposite the fingers e , the knob completed by being forced through the female die F, and the parts returned preparatory to another operation, the mechanism by which these operations are intermittently and simultaneously carried on will now be described.

The reciprocating head f^2 , which carries the die or plunger, is operated by a pitman f^x , secured upon the crank-shaft g , which shaft is journaled in the frame sides. Outside of one side of the frame it has a fixed sleeve g' upon it, the sleeve and shaft being slotted to pass a bar g^2 , which is pivoted in the slot and normally held by a spring g^3 in the path of a pin g^4 , which projects from a collar of the driving-wheel G, which is fitted to turn loosely on the shaft g . The head or sliding block f^2 has secured upon it an arm f^3 , through which the rounded lower end of the sliding bar f^4 slides, the upper end of said bar being guided in the end of a bar f^5 , secured on top of the frame. The lower square shoulder of the bar f^4 is pressed on top of the arm f^3 by a spiral spring f^6 . The lower end of this bar has an arm projecting from it, in which is secured a vertical pin f^7 , which when the head f^2 is carried down passes through one of the exterior notches in the ring C and into a corresponding groove in the casting B. The bar f^4 carries a curved or cam arm f^8 , which projects below the pivoted bar g^2 when the pin f^7 passes through the notch, as shown in Fig. 1; but should the ring become clogged from any cause the point of the pin f^7 would strike the top of the ring, force up the bar, and bring the cam-arm f^8 in the path of the actuating pivoted bar g^2 , swing it around to the vertical position out of the path of the pin g^4 , and stop the machine, so as to prevent breaking any of the parts.

The mechanism above described for operating the reciprocating head, the clutch mechanism, and the means for disengaging the clutch to prevent accident are not new in die-

presses or punching-machines and need not, therefore, be more specifically described.

The mechanism for severing a knob-shank from a rod or coil of wire, feeding the severed shank over the perforation in the head-blank, and forcing the shank into the perforation preparatory to having the shank and collar secured together is my invention and will now be particularly described.

The part B' of the casting B is grooved to receive the sliding bar E, which carries the shank-fingers e , and also grooved at right angles to the bar-carrying groove to receive the sliding knife-carrying frame H, the sliding members being held in these grooves by plates e^2 and h .

The part B' is perforated to receive a cone-shaped perforated steel plug E', through which the wire rod e^3 , from which the shank e' is severed, is fed, preferably, from a coil of wire, and the mechanism for feeding the wire forward and straightening it as it comes from the coil is the same that is used in wire-nail machines, and consists in this case of a pair of pulleys e^4 , secured upon parallel shafts e^5 , the shafts being geared together by pinions, one of them having a ratchet-wheel e^6 upon it, which is actuated by a cam-rod e^7 , the upper end of which is slotted to pass over the extended end of the shaft g . The rod is provided with a friction-wheel e^8 , which is operated by a cam e^9 , secured upon the shaft g . The friction-wheel e^8 is held in contact with the cam by a spring e^{10} . The casing is also perforated to receive the hanger e^{11} , in which the rock-shaft e^{12} , which carries the arm e^{13} , is mounted, the arm e^{13} engaging a notch of a depression in the sliding bar E, reciprocating it and the carrying-fingers mounted upon it to take the severed shank from the cutters and carry it forward over the head-blank. The plug E', which is cone-shaped on top, furnishes the stationary member to hold the wire while it is severed from the blank by the knife h' , which is carried in front of the frame H. The knife, as seen in Fig. 4, has a notched edge to cut the top of the blank slightly rounding, and on top of the knife is a die h^2 , which has a cone-shaped depression corresponding with a similar cone-shaped depression in a stationary die h^3 to put a point on the upper end of the shank e' at the same time that the shank is severed from the rod, said die and knife being held in the forward end of the carrier H by a bar h^4 , which is screwed down onto the carrying-head.

The knife-frame is reciprocated by a pivoted cam-shaped lever h^5 , which bears against a friction-wheel h^6 on the rear end of the frame, the cam-lever being fulcrumed at h^7 . To the outer end of this lever is connected a rod h^8 , which is slotted at its upper end to pass over the shaft g and provided above its slotted end with a friction-wheel h^9 , which is held in contact by its own weight with a cam h^{10} , secured upon the shaft g . h^{11} is a curved pivoted arm, the ends of which bear against

the friction-roll h^6 and the cam h^5 when the rod h^8 is drawn up to force the knife suddenly forward to sever the rod. The upper finger of the curved arm rides over the cam, and when the rod h^8 returns to its lower position it rocks the pivoted member h^{11} and retracts the knife-frame, as seen in Fig. 6.

The bar E for actuating the spring-fingers which carry the severed shank over the knob-head in the ring C is actuated by a cam e^{14} , secured upon the shaft g , bearing against a friction-roll e^{15} , which is secured on a bar e^{16} , fitted to slide in the box e^{17} , which is secured to the frame of the machine, the wheel being held in contact with the cam by a spring e^{18} , the upper end of which is secured to a pin projecting from the box e^{17} and the lower end of which is connected to the extended end of a journal e^{19} , which connects the pitman e^{20} with a rock-arm e^{21} , which is secured upon the rock-shaft e^{12} . The spring-fingers e are secured upon each side of the carrier e^{22} , which is connected by a transverse pivot to a bar e^{23} , which is connected by a vertical pivot to the sliding bar E. The rear end of the pivoted bar is V-shaped to engage a V-shaped notch in a bar in the rear of it, which is also connected to the bar E by a pin or pivot. The purpose of making these joints and connecting the parts by springs e^{24} and e^{25} is to make the finger-carriers slightly flexible, so as to allow them to give slightly to firmly grasp the pin without injury. The finger-carrier e^{22} is moved downwardly around its horizontal pivot by a bell-crank lever e^{26} , which is pivoted to a fixed part of the machine. The lower arm of this lever bears upon the top of the carrier, and the upper arm is engaged by a bar h^{12} , which is secured on top of the knife-carrier, so that as the knife is being carried forward to sever a shank from the rod the bell-crank lever is depressed, depressing the forwardly-moving fingers e to take a lower bite upon the rod. The forward movement of the fingers is checked while the shank is being severed from the rod by the knife, and as the knife moves back the fingers and member e^{22} are returned to the horizontal position by the spring e^{25} and again moved forward to carry the severed shank over the ring C.

Secured to the front of the reciprocating head f^2 is an arm j , which carries at its end a threaded tube J, into which is adjustably fitted a screw-threaded rod j' . The lower end of this rod projects over the shank that is held by the fingers e over one of the perforated knob-heads ready to be inserted. The lower end of this die has a flaring mouth to pass over the point of the shank, and as the head f^2 is carried down to punch one of the finished knobs through the die F the rod j at the same time drives the shank into the place in the knob beneath it. At the same instant the fingers are retracted, leaving the shank in place to be carried around to the finishing-dies.

The bar C^2 is reciprocated by a cam c^5 , secured upon a shaft journaled in the upper frame of the machine parallel with the shaft g (which shaft is also provided with a gear-wheel c^6 , which meshes with the gear g^5 , keyed on the shaft g) by means of a pivoted lever c^7 , which has a friction-wheel at its upper end, which is held in contact with the cam c^5 by a coil-spring c^8 , one end of which is connected to the upper end of the bar and the opposite end to the bar c^9 , which extends out from the frame of the machine. The bar c^7 is connected at its lower end by a link c^{10} to a pin projecting from the extended end of the bar C^2 , and the pawl c is held in engagement with the inner notches of the ring C by a coil-spring c^{11} , connecting an inwardly-extending arm with the arm c^4 , which actuates the sliding bar c' and detent c^2 . The detent c^2 is normally held engaged with one of the inner notches by a coil-spring c^{12} , seated in the groove b' between the inner end of the bar and the end of the groove.

The operation of the machine may be briefly described as follows: The cams upon the driving-shaft are so timed that when the ring C has come to rest a length of wire sufficient for the shank will have been fed up through plug E' , caught by the fingers, severed by the knife, and carried over the perforation in the knob-head. So soon as the shank reaches this position one of the knobs has dropped into the finishing-die immediately under the upper die or plunger. The ring remains at rest while the sliding die-carrier is forced down, driving one shank into the knob-head and forcing the finished knob, compressed upon the shank, through the finishing-die. On the upper movement of the reciprocating head the sliding bar C^2 has been retracted, at the same time drawing the detent out of one of the inner notches and holding it disengaged until the pawl has taken a new bite and started the ring. By this time the die F' and finger f^7 are above the surface of the ring and the bar C^2 begins to move forward until it is again stopped in the position shown in Fig. 2. The operation is continuous and completely automatic. The only attention required is to fill the hopper with knob-blanks and place a new coil of wire in position when one has been exhausted.

I have shown my invention in what I believe to be its simplest form; but it is obvious that many mere mechanical changes may be made without varying its scope, and hence I do not desire to be limited to the exact details shown.

What I claim is—

1. In a machine for securing shanks in carriage-knobs the combination of the carrier to receive the head-blanks, mechanism substantially as described to impart an intermittent movement to the carrier, a chute arranged alongside the carrier to feed the head-blanks to it, the wire-feeding mechanism to intermittently feed the wire the length of a shank

also arranged at the side of the carrier, fingers to grasp the shank and after it has been severed to feed it over the knob-head in the carrier, the cutter to sever the shank from the wire, the female die to receive the knob-head and shank from the carrier, the reciprocating head, the arms secured to said head and carrying a rod which projects over the severed shank held by the fingers, the male die secured in said reciprocating head, and means such as shown to actuate said head, whereby on each downward stroke a shank is placed into one of the head-blanks in the carrier and the head and shank of the knob in the finishing-die secured together, thus completing one knob and placing a shank in the blank-head of another simultaneously, substantially as shown and described.

2. In a machine of the character described the combination of the die-press having a reciprocating head to receive a male die or plunger, a circular ring-carrier mounted on a bed in front of the die or plunger and having an external notched rim to receive blank knob-heads and a notched inner rim to engage a pawl for imparting an intermittent movement to said carrier, a sliding bar upon which said pawl is pivoted and a locking-detent to hold the carrier when the pawl has

completed its stroke, means such as shown to actuate the sliding bar and pawl and detent, segmental plates to retain the blank-heads while being carried underneath the plunger, and a female die below the plunger to receive one of the knob-heads with the shank in it at each alternate movement of the carrier, whereby the head is forced through the lower die at each downward movement of the plunger and the base and neck compressed upon the shank and the knob completed, substantially as shown and described.

3. In a machine for securing shanks in knob-heads the combination of the intermittently-moving carrier adapted to receive and carry blank knob-heads, means to feed a length of wire upwardly, fingers to grasp the wire and after a shank has been severed from it to carry it over one of the knob-blanks in the carrier-knives to sever the shank from the wire, and a reciprocating head to force the shank from the fingers into the blank head, and means such as shown for actuating said knives and fingers, substantially as shown and described.

FRED A. NEIDER.

Witnesses:

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W. V. WELDON.