(No Model.) 12 Sheets—Sheet 1.

E. PHILLIPS.

SCREW CUTTING AND POINTING MACHINE.

No. 468,524. Patented Feb. 9, 1892.

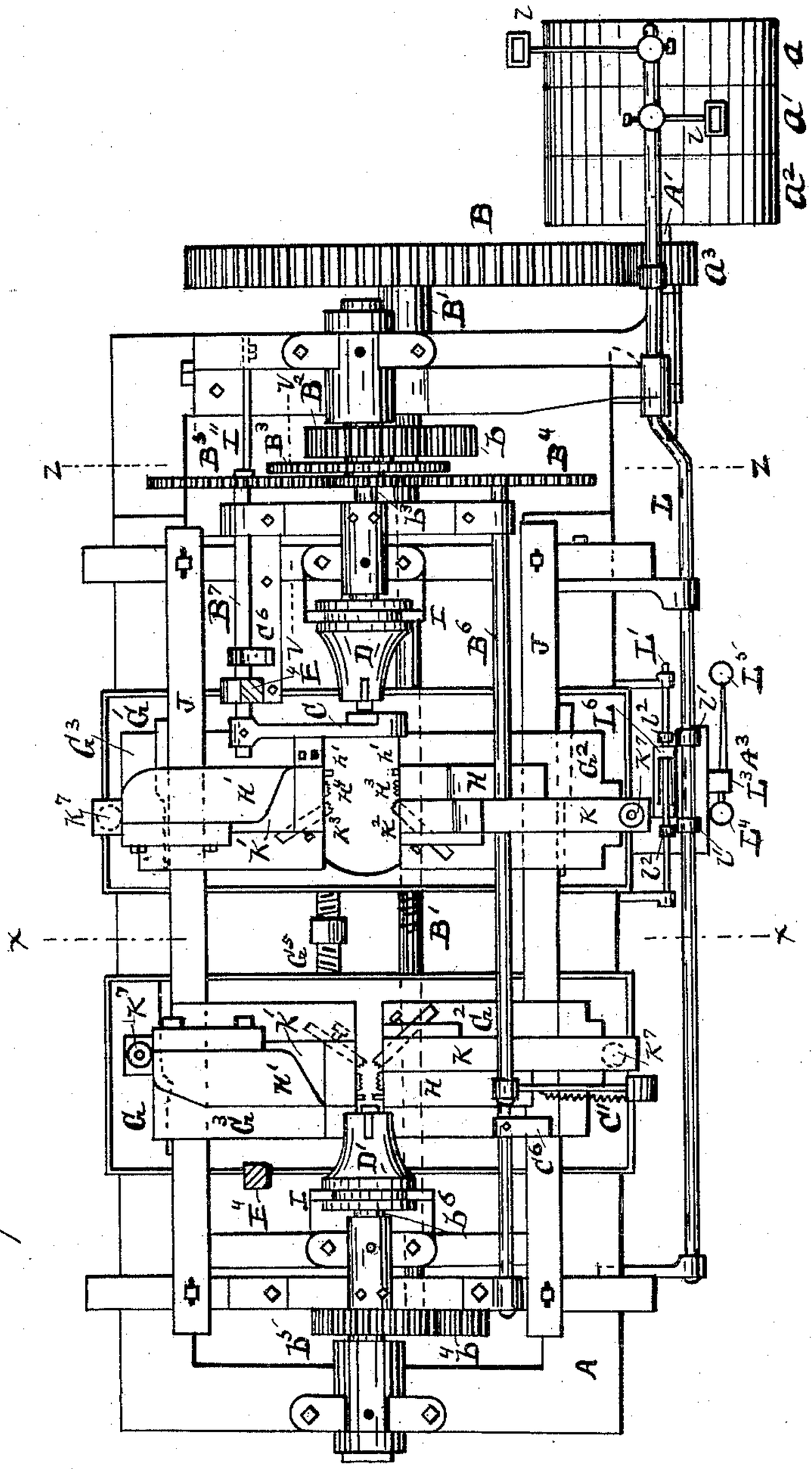

FIG. 1.

Witnesses.
John Schuman.
John F. Miller.

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Newell S. Wright.

(No Model.) 12 Sheets—Sheet 2.

E. PHILLIPS.

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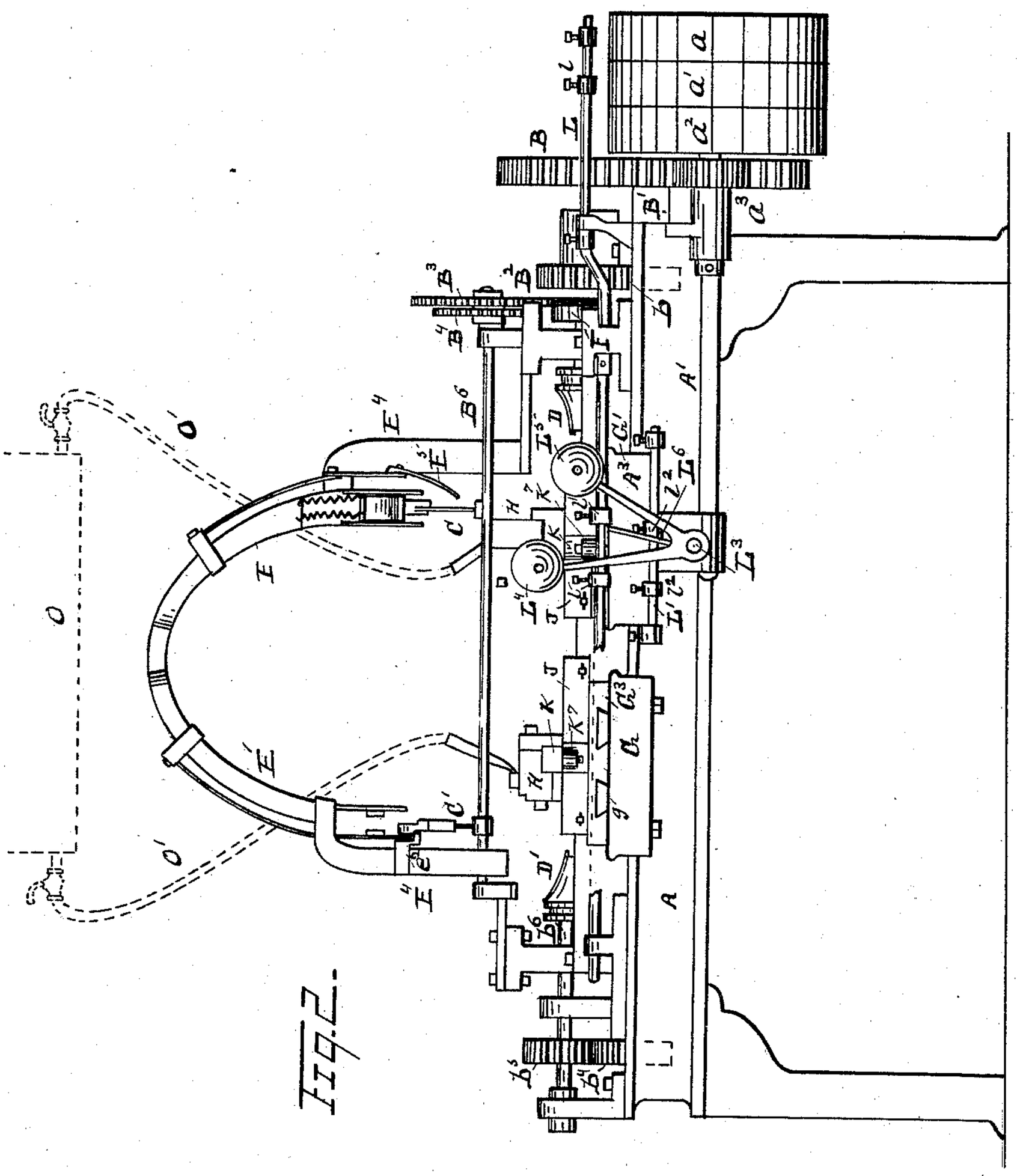

Fig. 2.

Witnesses
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(No Model.) 12 Sheets—Sheet 3.

E. PHILLIPS.

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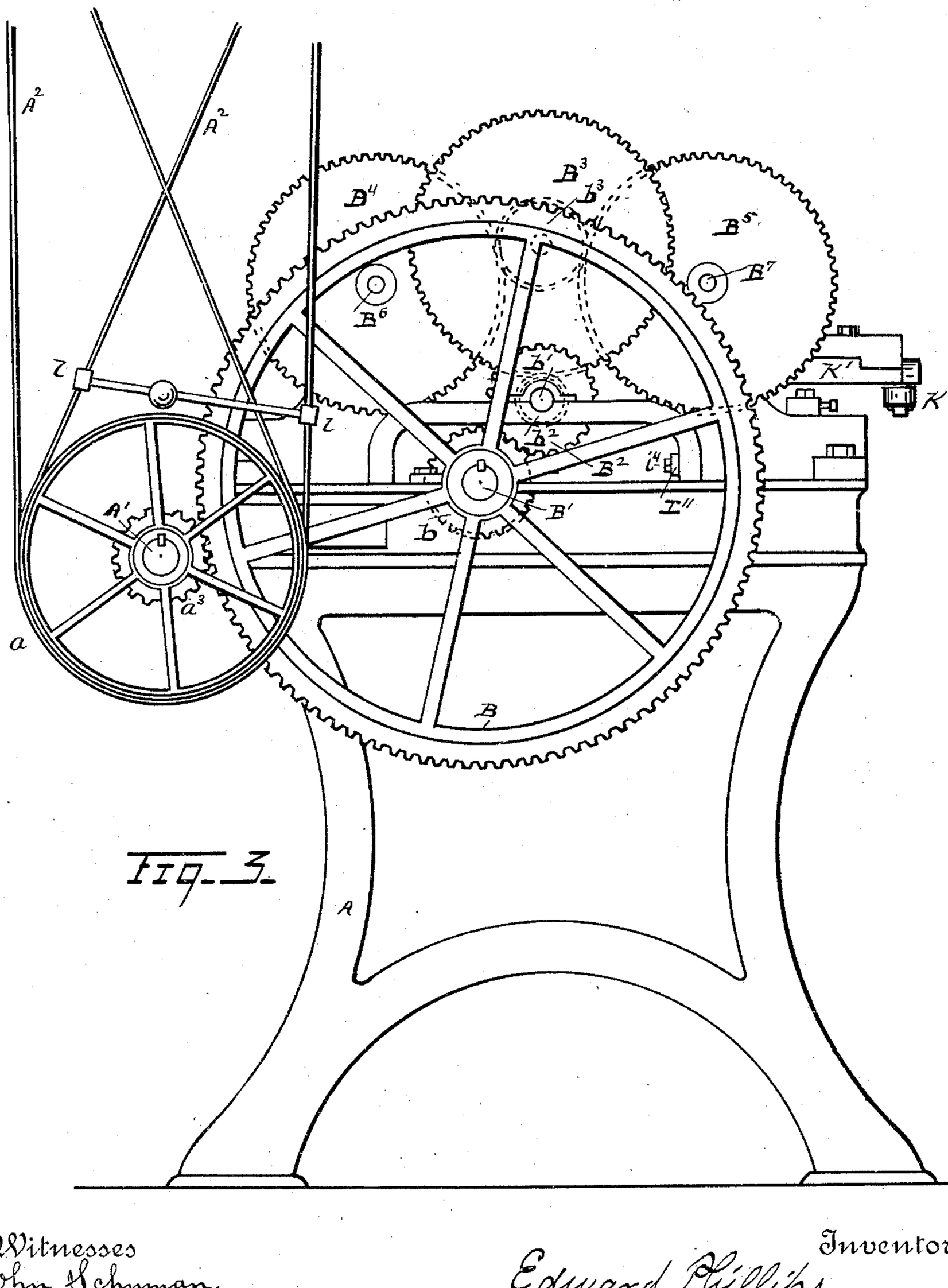

Fig. 3.

Witnesses
John Schuman.
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E. PHILLIPS.

SCREW CUTTING AND POINTING MACHINE.

No. 468,524. Patented Feb. 9, 1892.

Fig. 4.

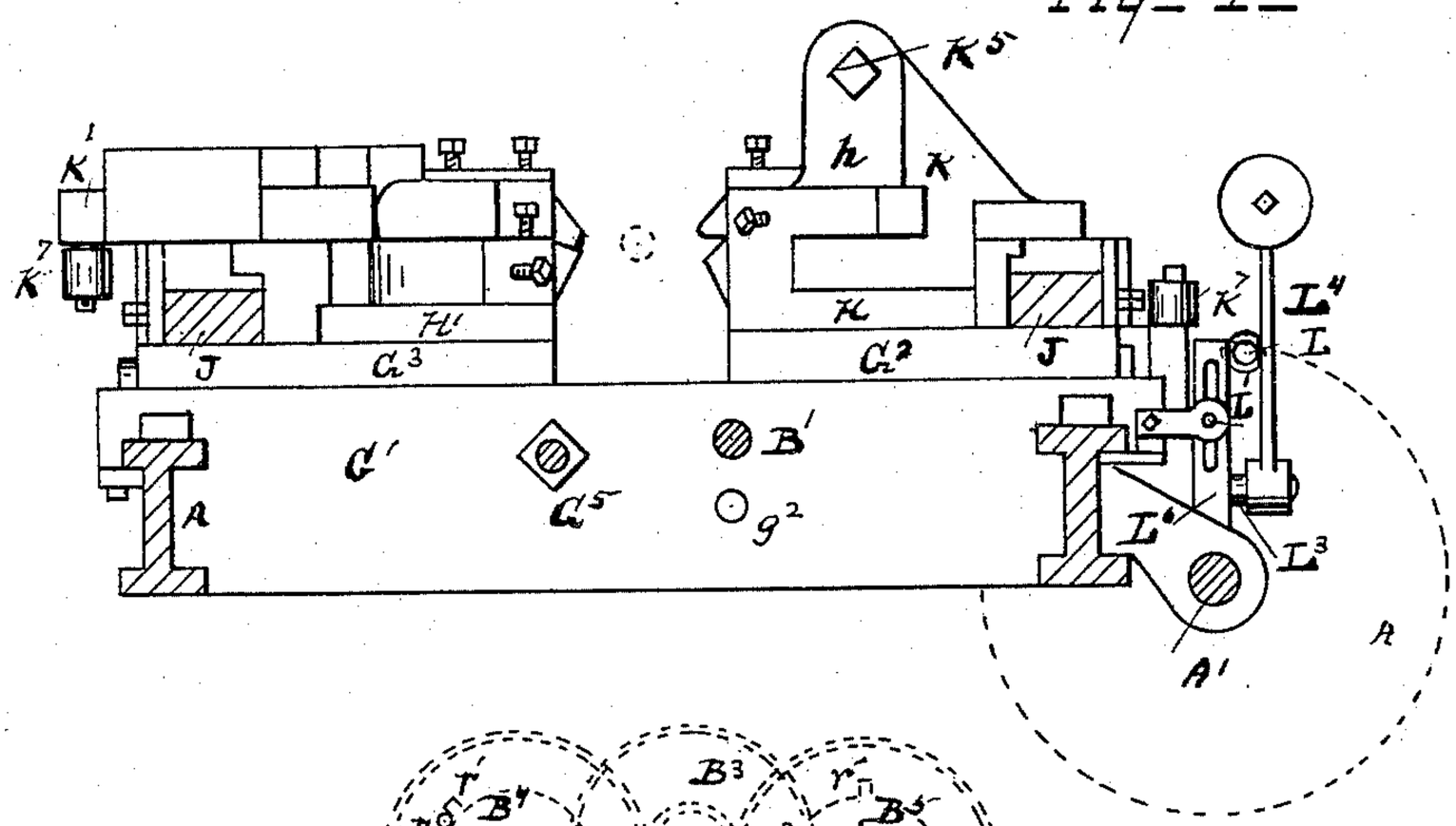


Fig. 5.

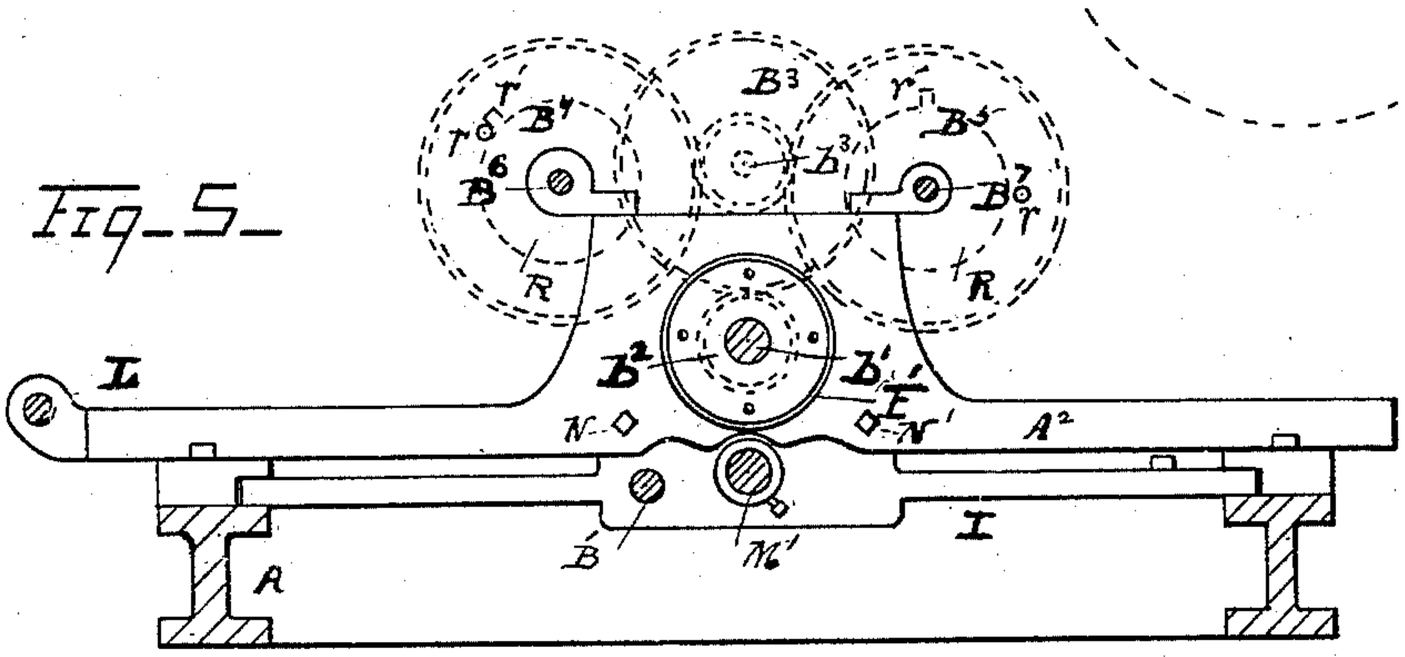


Fig. 34.

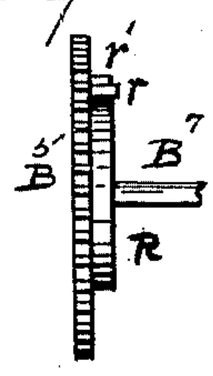
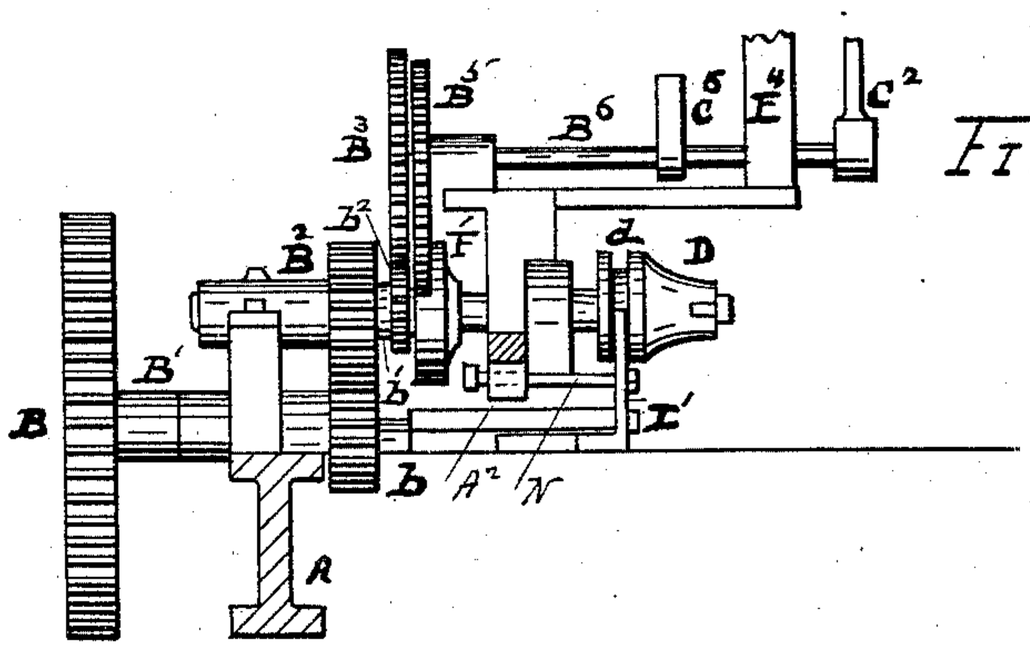


Fig. 6.



Witnesses
John Schuman.
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E. PHILLIPS.

SCREW CUTTING AND POINTING MACHINE.

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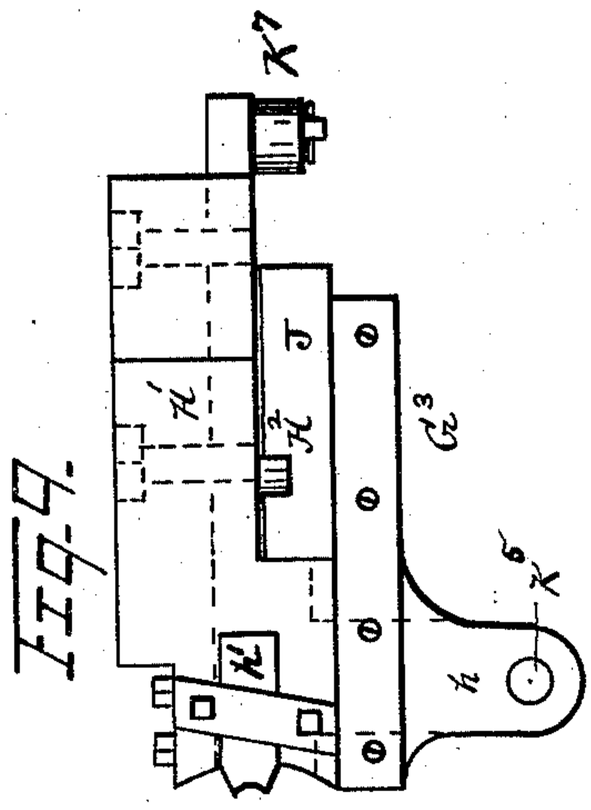

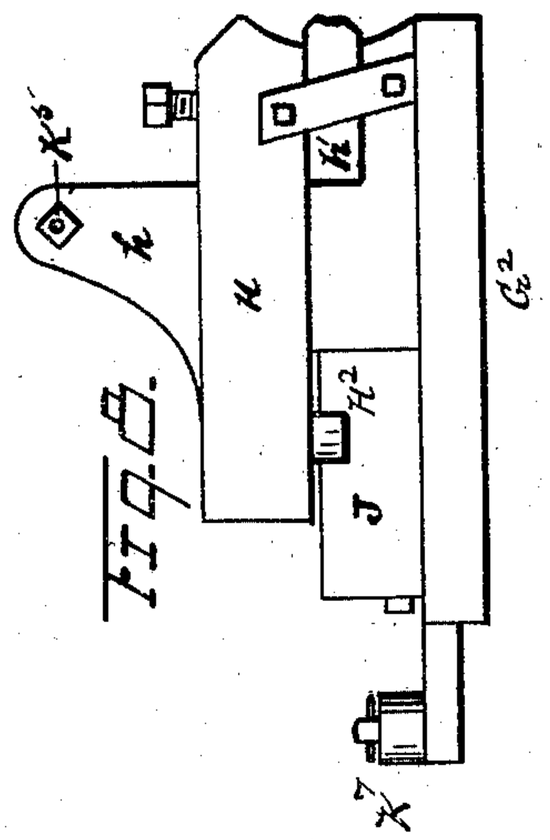

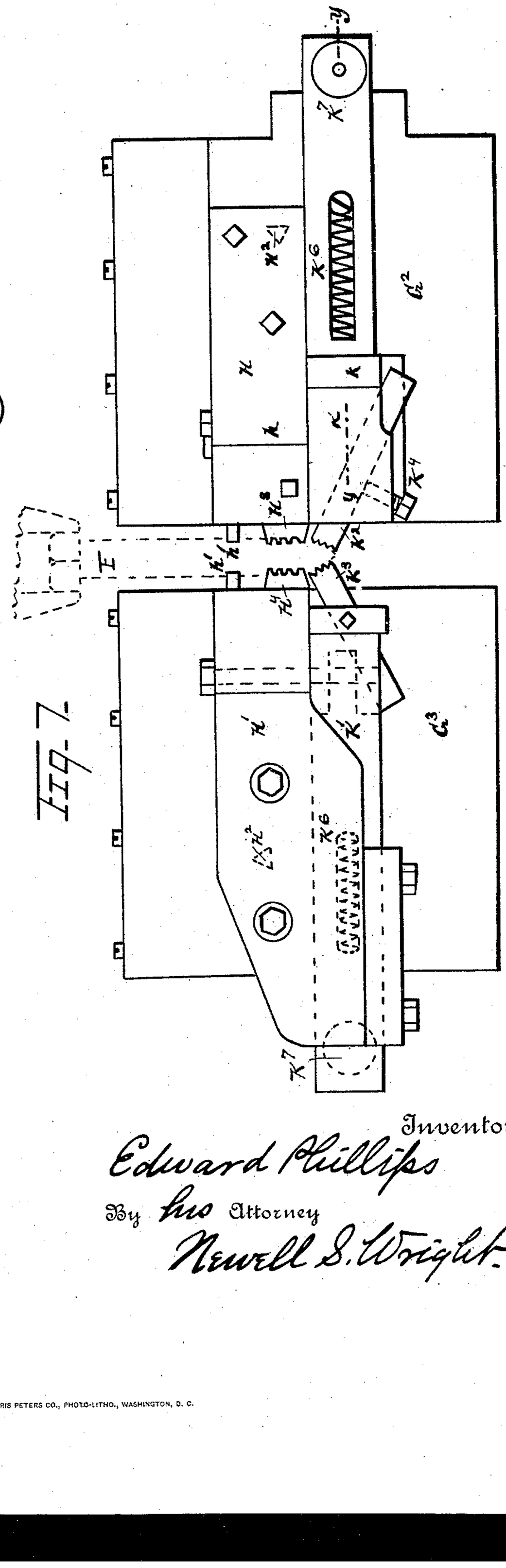

Witnesses
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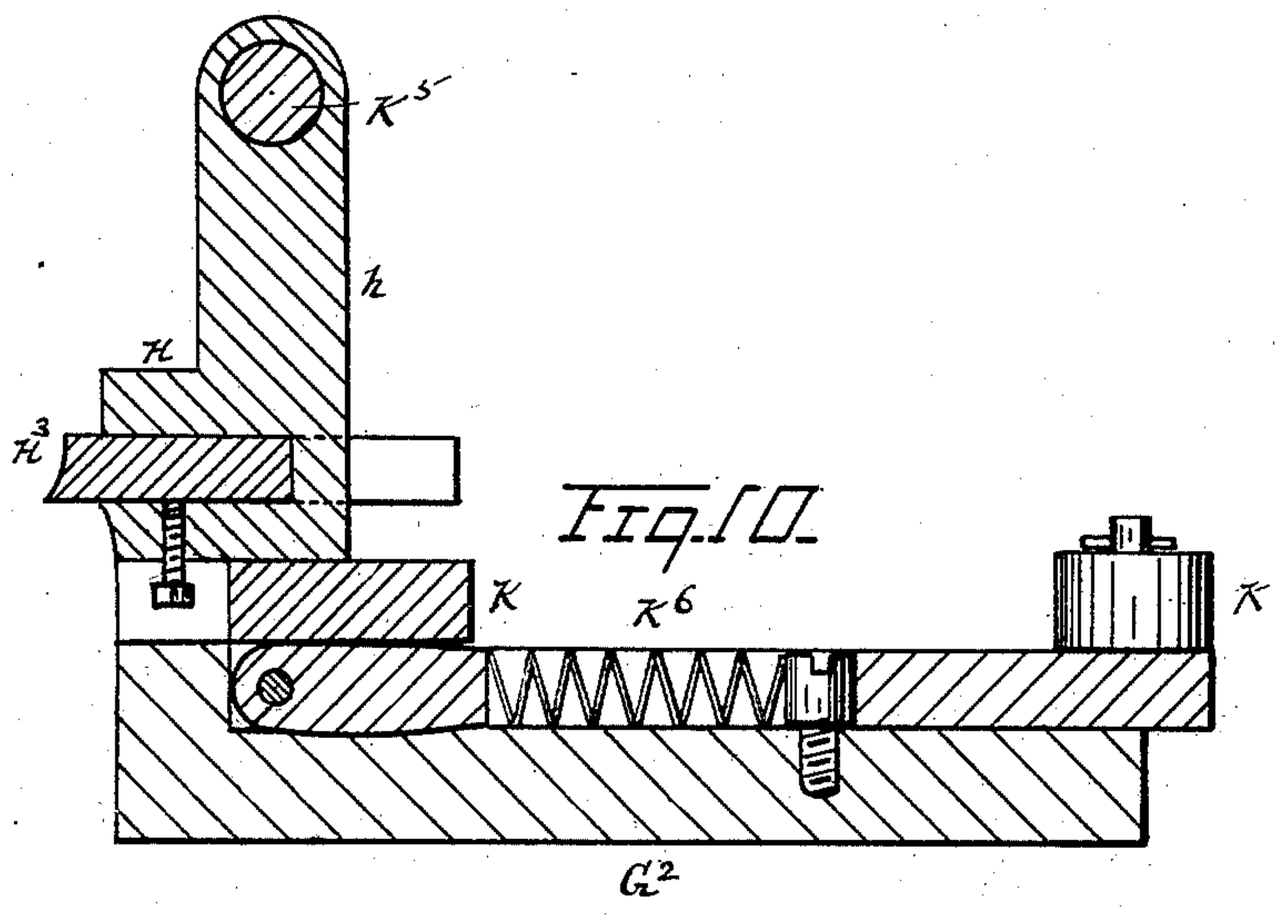


Fig. 10.

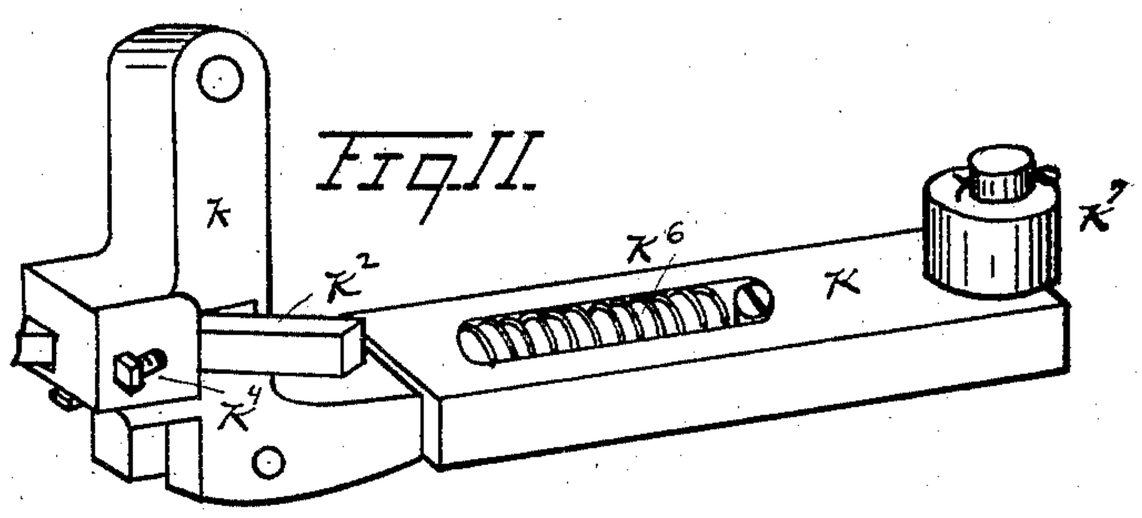
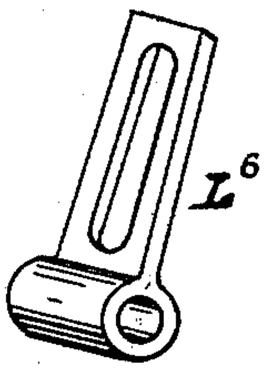


Fig. 11.

Fig. 9.



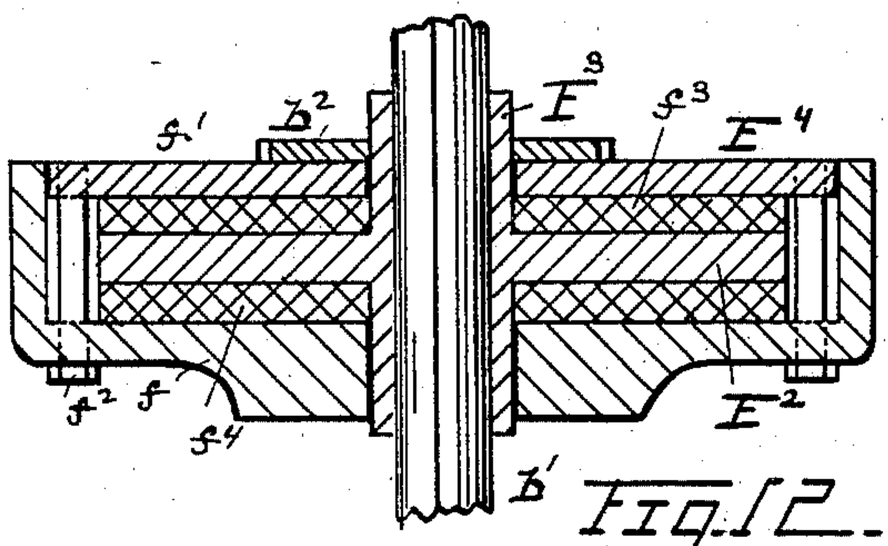


Fig. 12.

Witnesses
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(No Model.) 12 Sheets—Sheet 7.

E. PHILLIPS.

SCREW CUTTING AND POINTING MACHINE.

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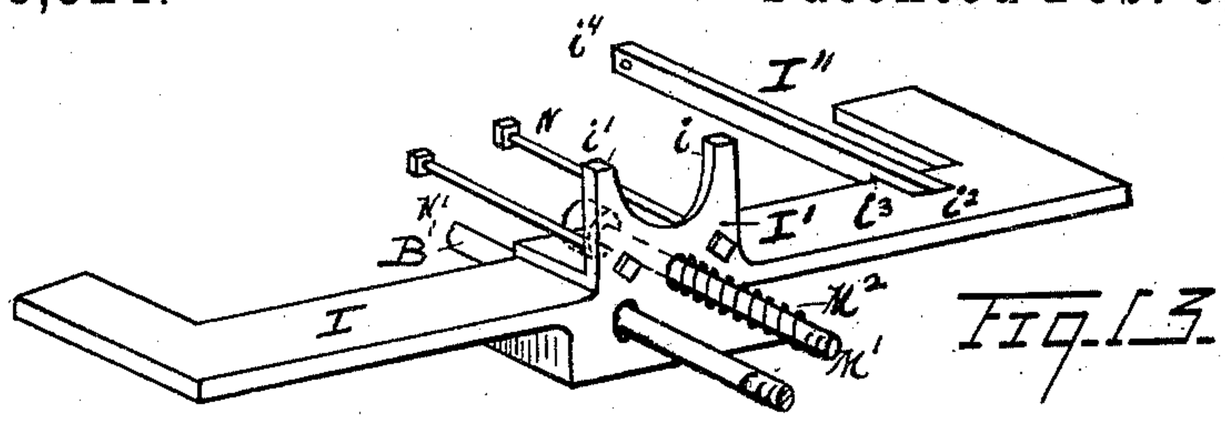

Fig. 13.

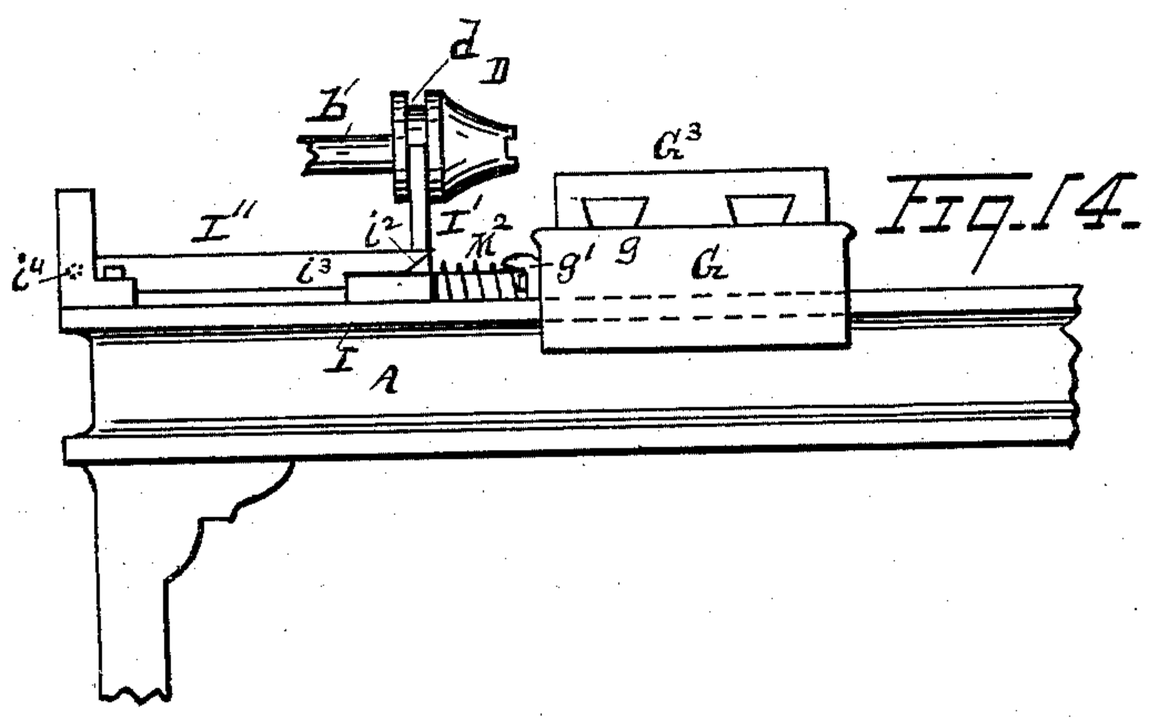

Fig. 14.

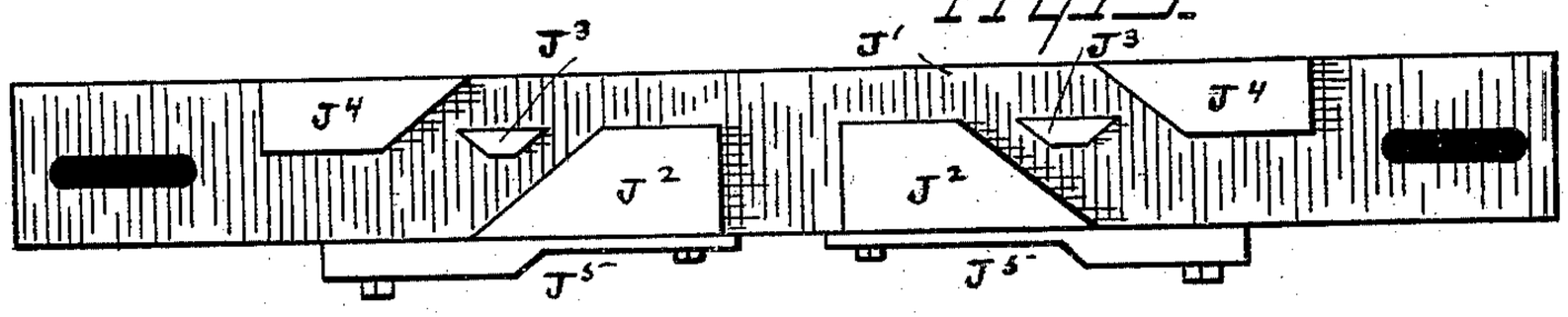

Fig. 15.

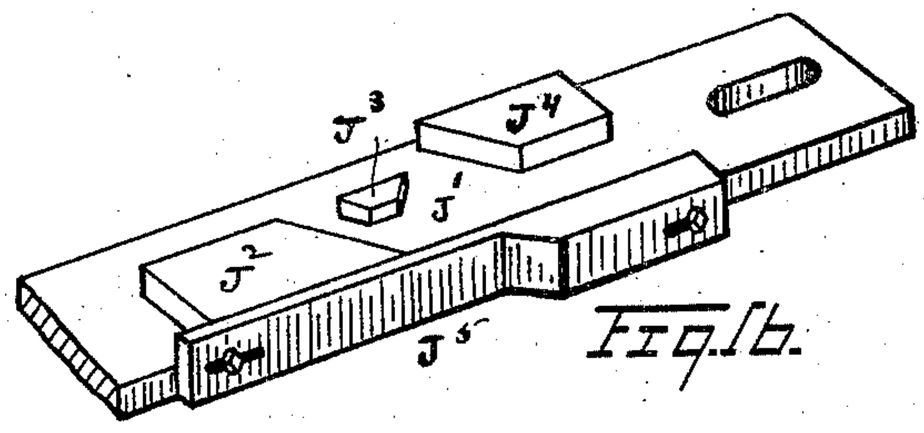

Fig. 16.

Witnesses
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SCREW CUTTING AND POINTING MACHINE.

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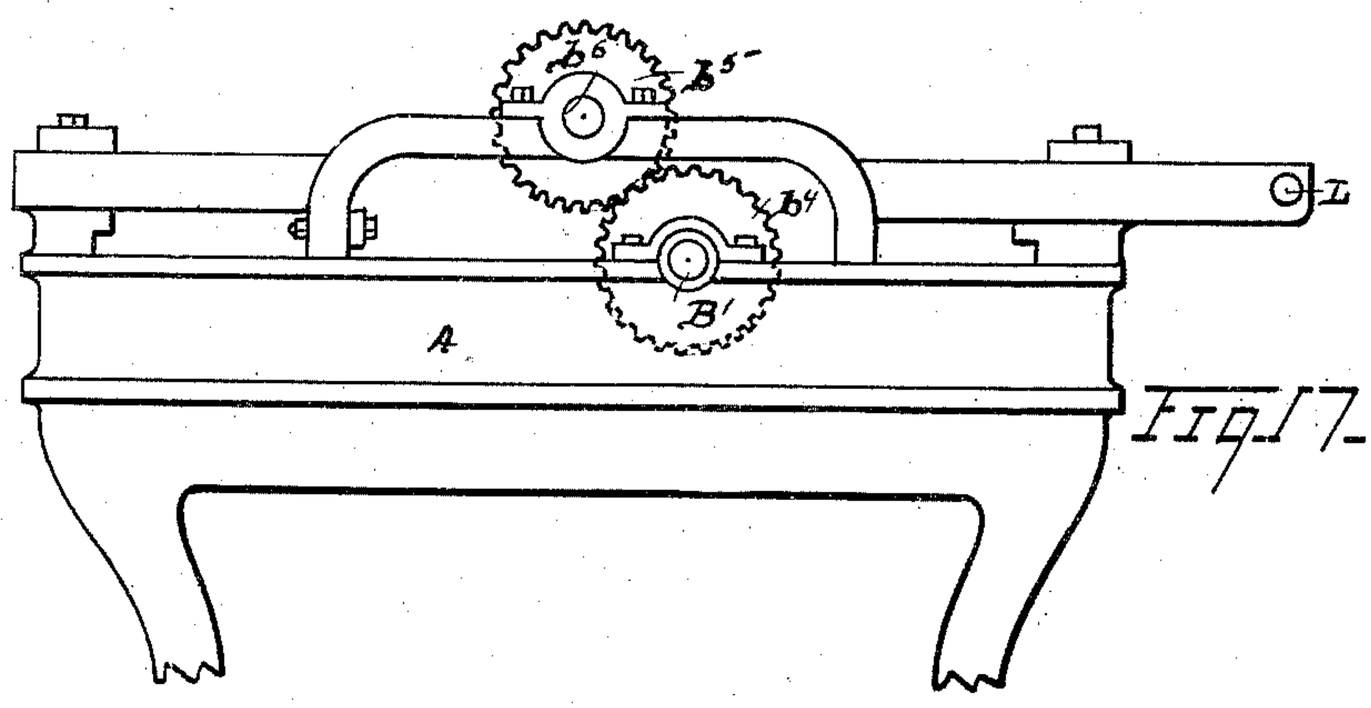
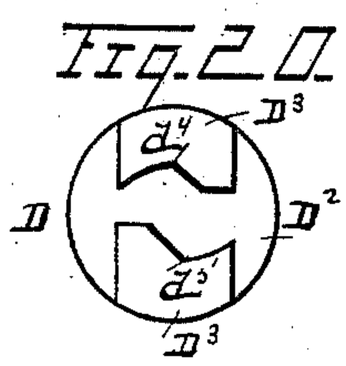


Fig. 17.



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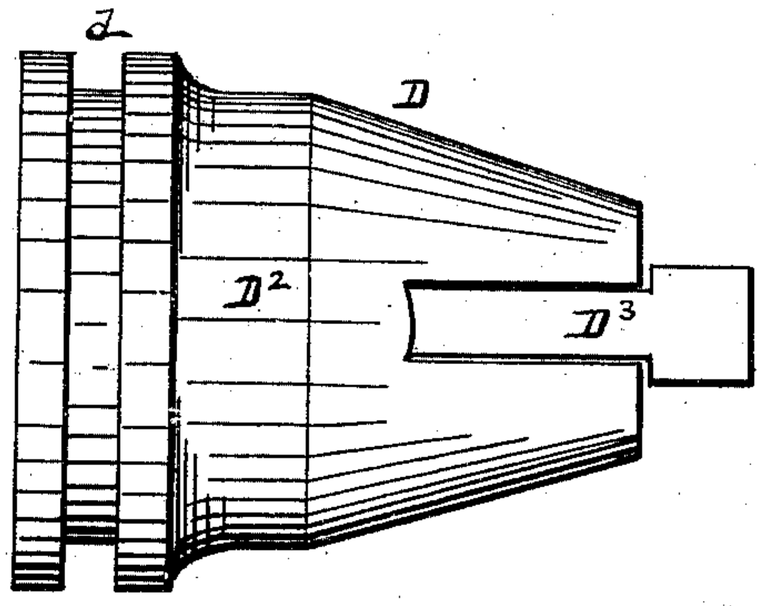
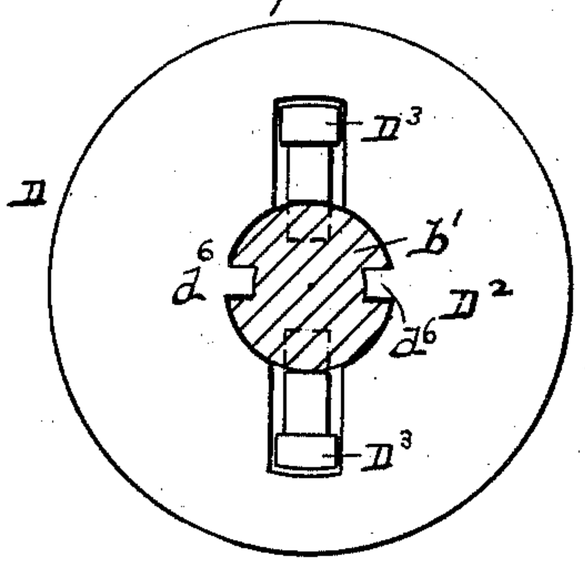


Fig. 18.

Fig. 21.



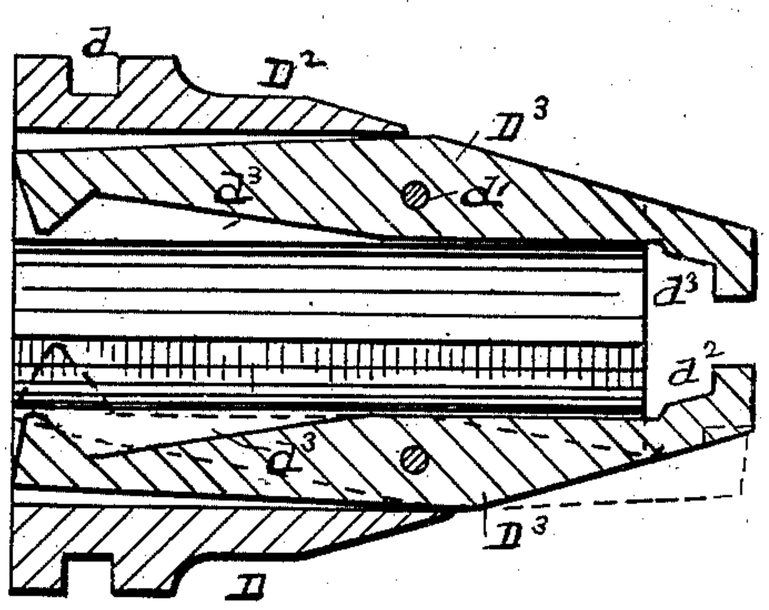


Fig. 19.

Witnesses
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E. PHILLIPS.

SCREW CUTTING AND POINTING MACHINE.

No. 468,524. Patented Feb. 9, 1892.

Fig. 24.

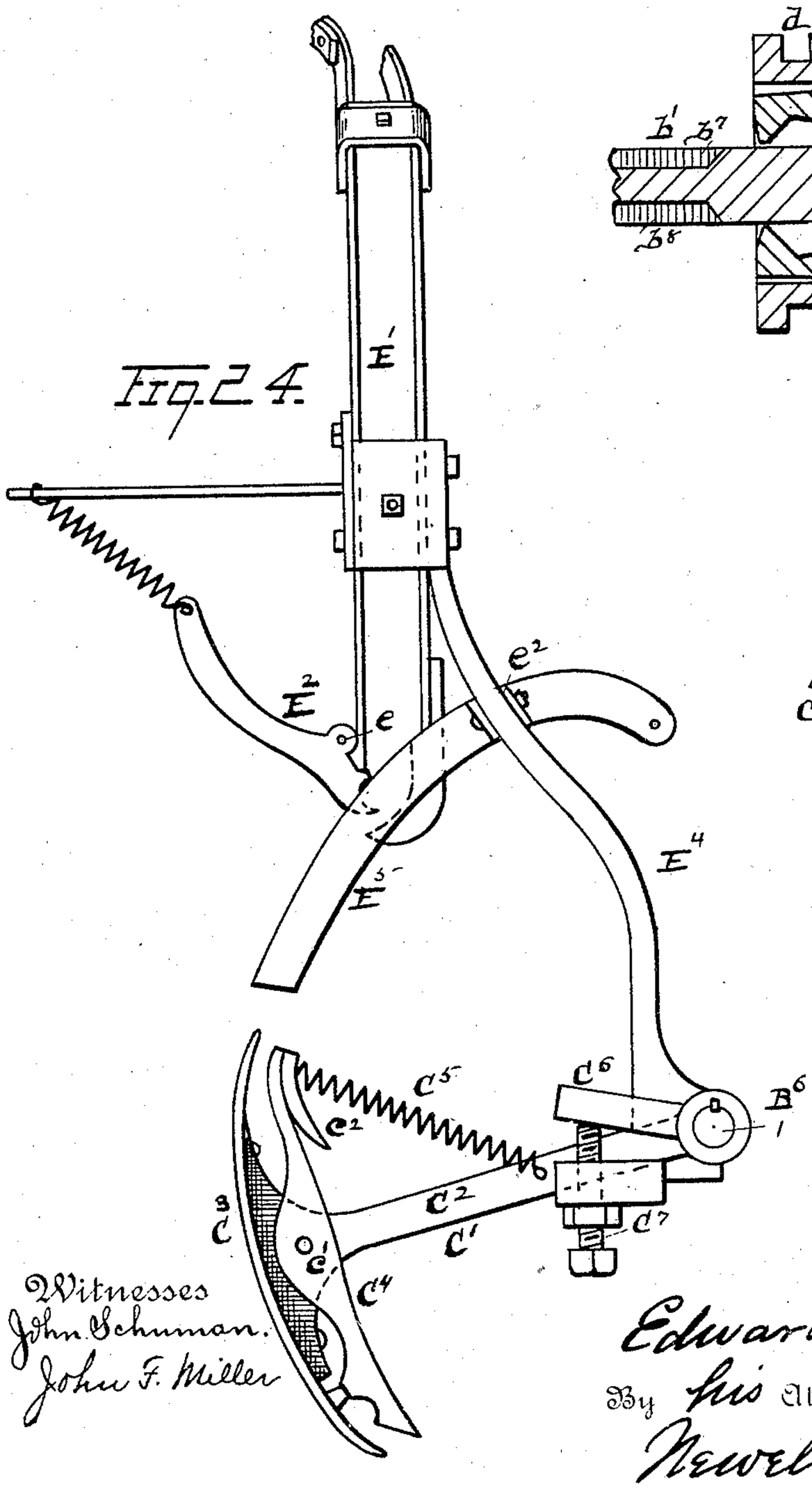


Fig. 22.

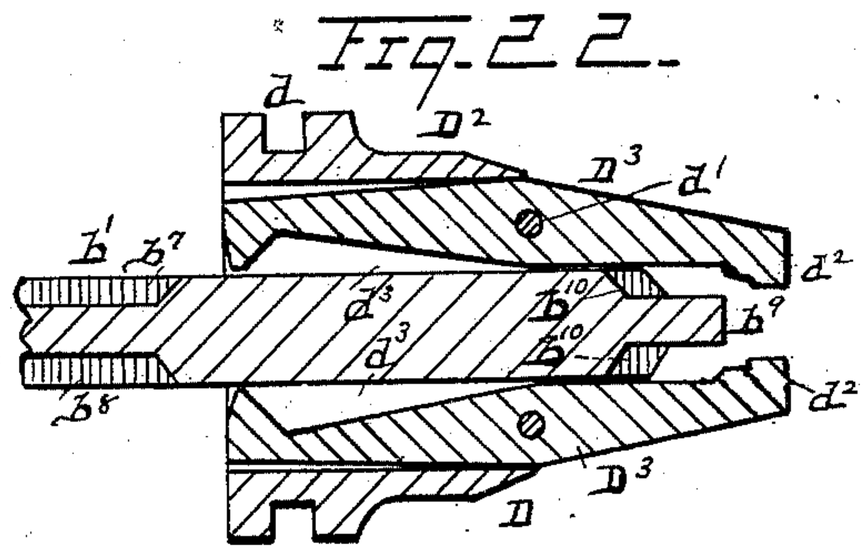
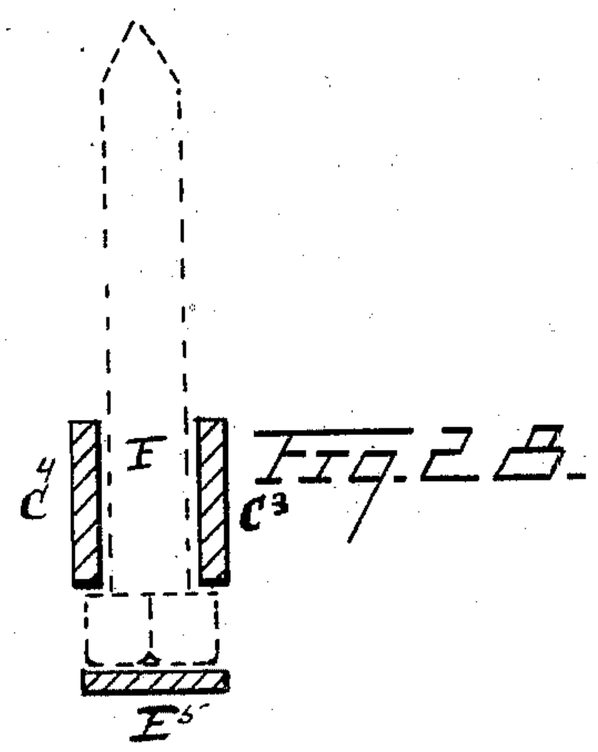


Fig. 23.



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SCREW CUTTING AND POINTING MACHINE.

No. 468,524. Patented Feb. 9, 1892.

Fig. 31.

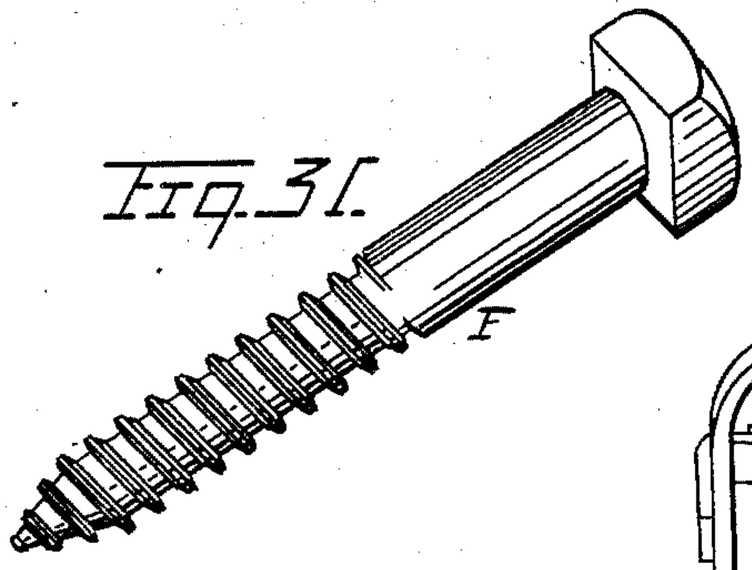


Fig. 30.

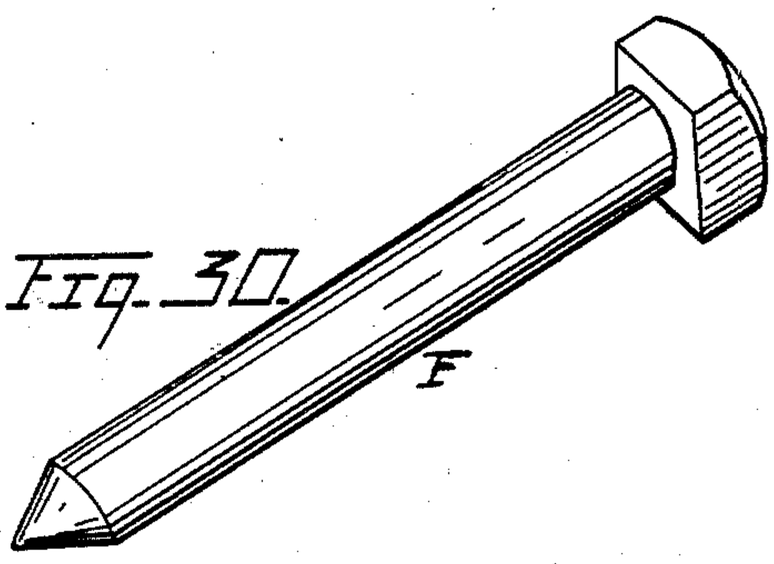
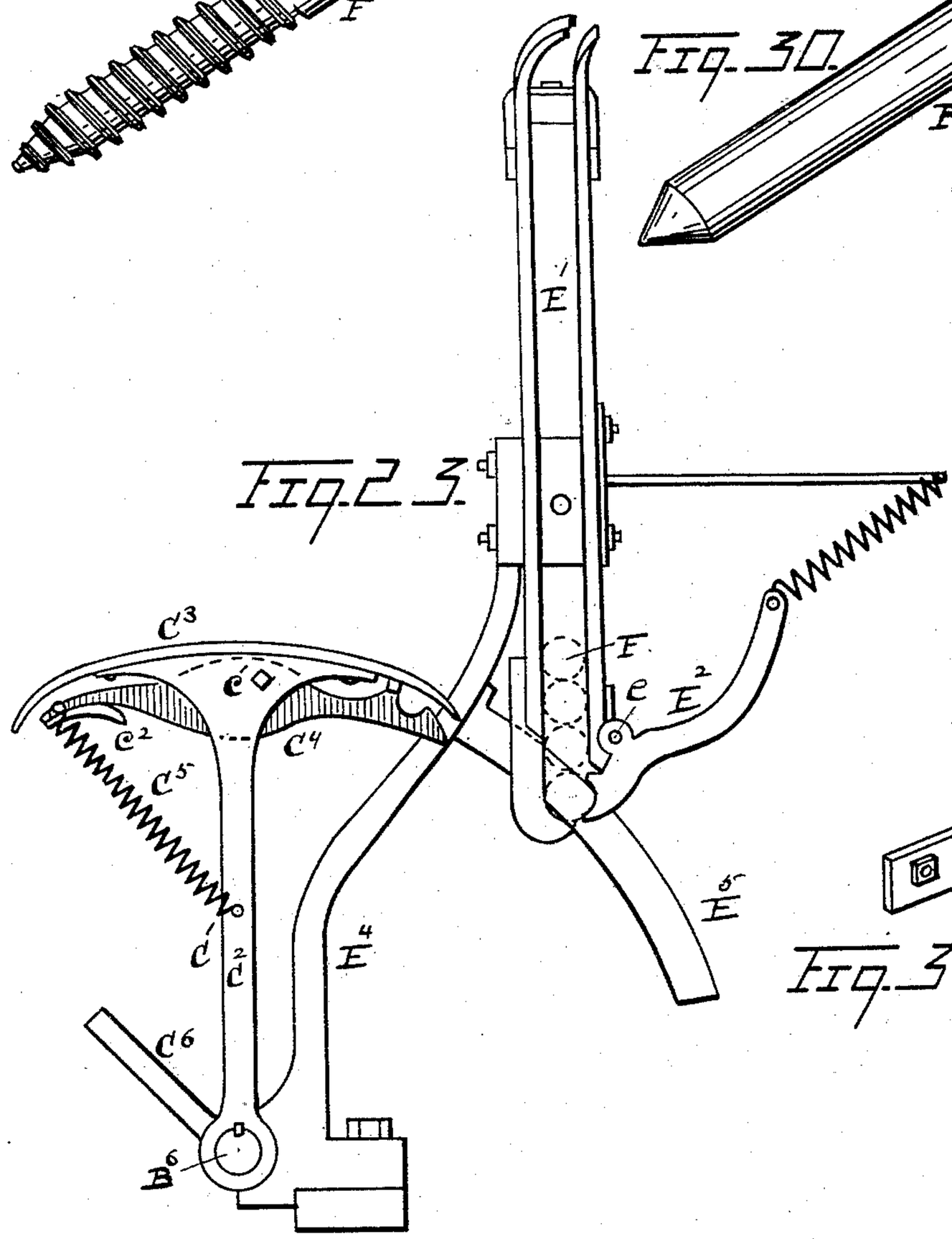


Fig. 23.



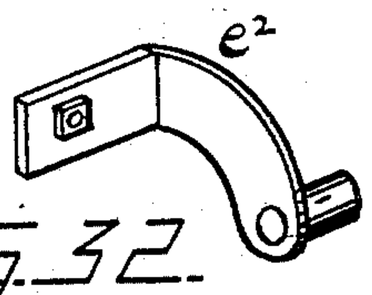


Fig. 32.

Witnesses
John Schuman.
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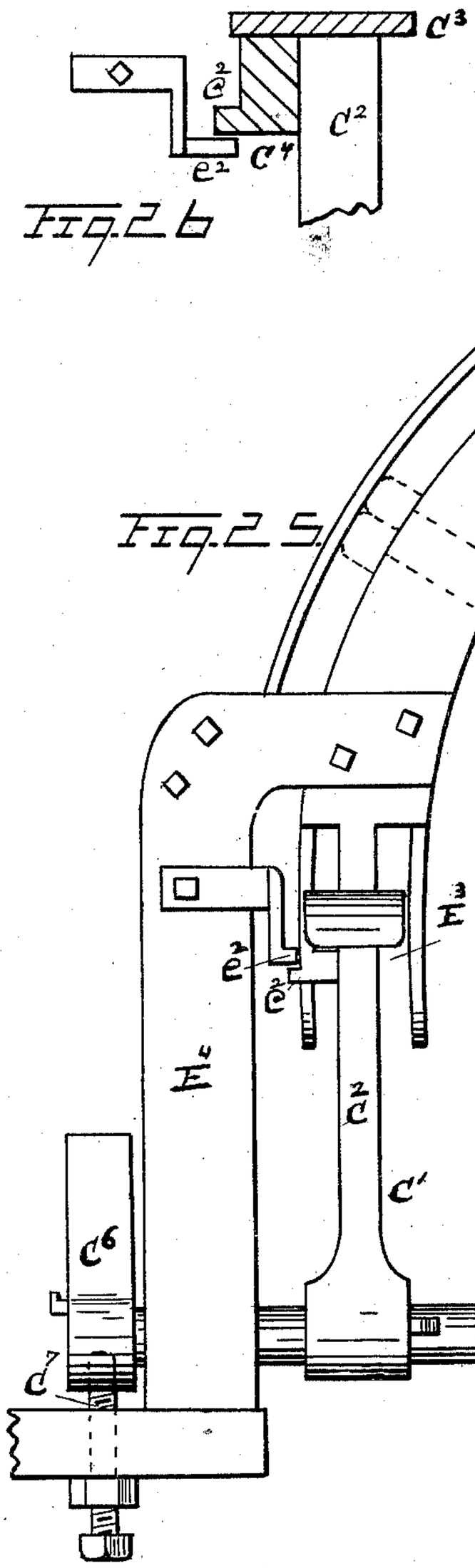
(No Model.) 12 Sheets—Sheet 11.

E. PHILLIPS.

SCREW CUTTING AND POINTING MACHINE.

No. 468,524. Patented Feb. 9, 1892.



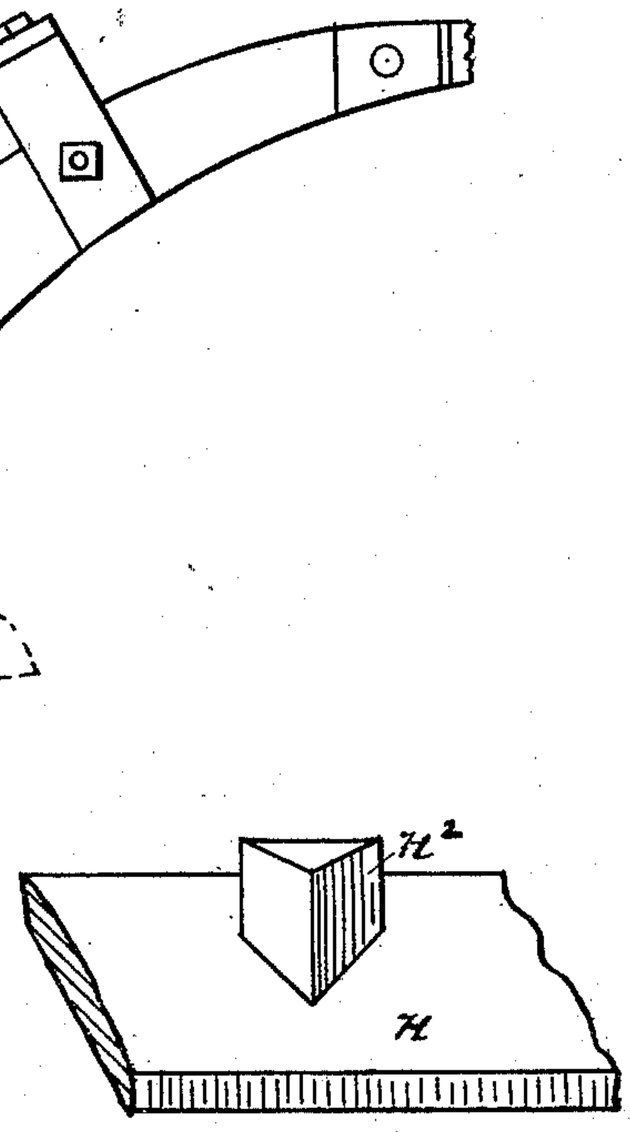


Fig. 27.

Witnesses
John Schuman.
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E. PHILLIPS.

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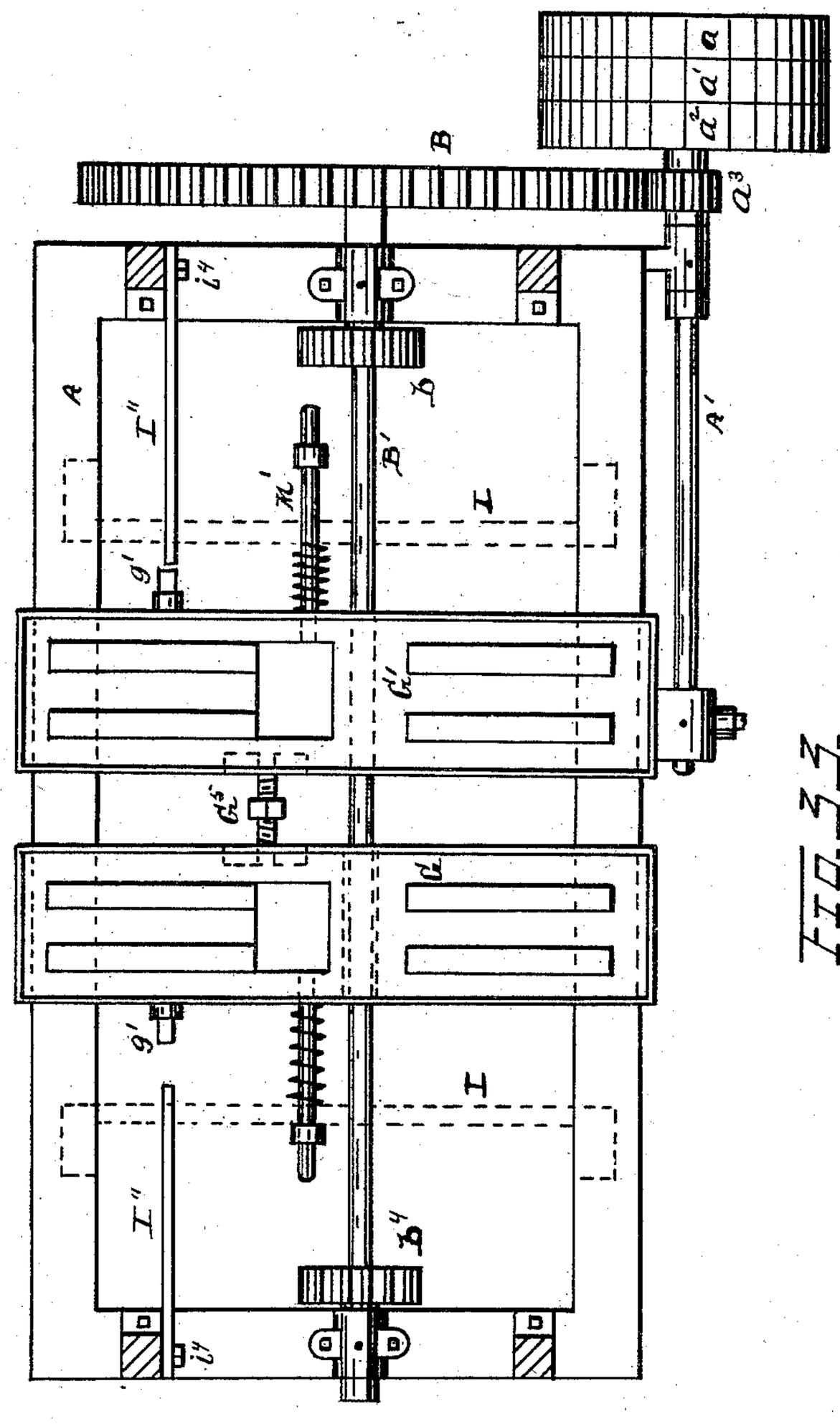

FIG. 33.

Witnesses
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By his Attorney
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UNITED STATES PATENT OFFICE.

EDWARD PHILLIPS, OF DETROIT, MICHIGAN, ASSIGNOR OF TWO-THIRDS TO EDWARD T. GILBERT AND LOUIS SEVIGNE, OF SAME PLACE.

SCREW CUTTING AND POINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 468,524, dated February 9, 1892.

Application filed July 20, 1891. Serial No. 400,134. (No model.)

To all whom it may concern:

Be it known that I, EDWARD PHILLIPS, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Screw Cutting and Pointing Machines; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to certain new and useful improvements in a screw cutting and pointing machine, and more particularly to a machine for cutting screw-threads upon screw-bolts, where it is used as a screw-cutting machine.

The invention consists of the device and appliances, their combinations and arrangements, as hereinafter described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a machine embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is an end elevation thereof. Fig. 4 is a vertical cross-section on the line *x x*, Fig. 1. Fig. 5 is a vertical cross-section on the line *z z*, Fig. 1. Fig. 6 is a vertical longitudinal section of a portion of the mechanism on the line *v v*, Fig. 1. Fig. 7 is a separate and enlarged view of a set of die-heads and the underlying bed-plates. Fig. 8 is an elevation of one of the upper die-heads. Fig. 9 is a side elevation of one of the lower die-heads. Fig. 10 is a view in section on the line *y y* in Fig. 7. Fig. 11 is a view in perspective of one of the cutter-heads. Fig. 12 is a vertical section through the friction-clutch. Fig. 13 is a view of one of the carriages which carries the chuck. Fig. 14 is a detail view in side elevation showing the locking and releasing mechanism connected with said carriage. Fig. 15 is a plan view of one of the guide-plates. Fig. 16 is a perspective view of a portion of the same. Fig. 17 is an elevation of the end opposite Fig. 3. Fig. 18 is a plan view of the chuck. Fig. 19 is a horizontal section of one of the chucks removed from the shaft. Fig. 20 is a front elevation thereof. Fig. 21 is a rear elevation of the same. Fig. 22 is a horizontal section through the chuck and the shaft upon which it is mounted. Fig. 23 is a detail view of the feeding device, showing the feeding-arms in position about to take a bolt from the feeding-chute. Fig. 24 is a view of the same from the opposite side in position about to deliver a bolt to the chuck. Fig. 25 is a front elevation of a portion of the feeding mechanism. Fig. 26 is a cross-section showing the gripping-jaws engaged with the dog e^2. Fig. 27 is a separate view of the guide-lug on the under side of one of the die-heads. Fig. 28 is a section across the gripping-jaws and guide-bar, showing a bolt engaged thereby. Fig. 29 is a separate view of the arm L^6. Fig. 30 is a view of a blank-bolt to be threaded. Fig. 31 is a view of a bolt when threaded by my improved machine. Fig. 32 is a view in perspective of the dog e^2. Fig. 33 is a plan view of parts of the machine. Fig. 34 is a detail view of mechanism for holding the feeders to allow the bolt to be threaded a desired distance.

Hitherto in the manufacture of screw-bolts it has been found difficult to thread the tapering point and the attendant has fed the bolts singly to the dies, which have necessarily had to travel along the bolt several times to cut the thread deep enough. This has consequently been a slow and unsatisfactory process.

It is one of the main objects in this invention to provide a machine which will cut threads upon both the body and the point of the bolt in one and the same operation, and which will cut the threads of the required depth in both at a single travel of the dies and cutters along the bolt. Another object of my invention is to cut a conical point on a bolt or screw. My invention is therefore calculated to greatly facilitate the manufacture of screw-bolts and to reduce the cost of manufacture.

With this object in view the machine is made automatically operative and of such capacity as to point or thread the bolts rapidly. To this end certain portions of the mechanism are duplicated to double its capacity and save hand labor.

I carry out my invention as follows:

A represents any suitable supporting-frame.

A′ is the driving-shaft, suitably journaled on the frame, provided with pulleys a a' a^2, providing for the shifting of the driving-belts A^2 and reversing the motion of the machine in a well-known manner by crossing one of the belts.

A^3 is a belt-shifting device, which will be more fully hereinafter described.

The driving-shaft is provided with a pinion a^3, meshing with a gear B on a shaft B′, properly journaled on the frame. This latter shaft is provided with a pinion b, meshing with a gear B^2, and the shaft b', which is provided with a pinion b^2, meshing with a gear B^3, the shaft of which is provided with a gear b^3, meshing with gears B^4 B^5 to turn them in the same direction. B^6 B^7 are the shafts on which the gears B^4 B^5 respectively are mounted. These shafts carry automatically-operated feeding-arms C C′ for carrying the bolts to the dies and cutters.

D is a chuck to engage the head of the bolt and hold it while it is being threaded. This chuck is engaged upon the shaft b'.

The shaft B′ runs longitudinally of the machine and is threaded to form a feed-screw. At the end thereof opposite the driving-pulleys said shaft is provided with a pinion b^4, meshing with a gear b^5 on the shaft b^6, on which is engaged a chuck D′, corresponding to the chuck D, forming a duplicate thereof. The special construction of these chucks will be further referred to.

E E′ denote feeding-chutes, within which the bolts F are placed by the attendant, the chutes being open at their upper ends for their reception. Through these chutes the bolts are fed to the feeding-arms C C′, respectively. Each chute is provided at its lower end with a spring-actuated retaining-arm E^2, hinged thereto on the lower side, as shown at e, so constructed as to normally close the base of the chute and hold the bolts therein. On the opposite side from the arm E^2 the base of the chute is open to allow the feeding-arms to enter and pick out the lower bolt, as at E^3.

E^4 is the support for the chute.

The feeding-arms C C′ oscillate back and forth, and each consists, essentially, of an arm C^2, engaged upon one of the shafts B^6 B^7, said arm at its outer extremity being provided with a fixed beak or jaw C^3 and with a spring-actuated pivoted beak or jaw C^4. The pivoted engagement of the latter is shown at c'. The points of said jaws are so formed that the fixed jaw C^3 in operation enters the chute between the lower bolt and the one above, the bolt being caught between the ends of the jaws in the downward throw of the arm C^2, the spring C^5, engaged with the outer end of the beak C^4 and with the arm C^2, securely clamping the bolt between the jaws as it is carried from the chute to the chuck below. In this operation the arm E^2 springs back to allow the feeding-arm to pass, the upper surface of the jaw C^3 serving to hold the remaining bolts in the chute as the feeding-arm passes along until the arm E^2 has opportunity to fly back into normal position.

E^5 is a guide-bar lying adjacent to the path of the feeding arm to crowd the bolts laterally in the gripping-jaws to bring their heads into proper alignment for their engagement by the chuck.

To more effectually bind and hold the bolts in the gripping-arm the gripping-jaws are so constructed and arranged in connection with adjacent parts that they connot be released from the bolt until the bolt is past the base of the feed-channel chute. To this end the jaw C^4 is provided with a lateral flange c^2 at its outer end, and the bar E^4 is provided with an outstanding dog e^2 to engage upon the upper surface of said flange as the flange is carried downward. The effect, as will be readily seen, will be to exert a strong leverage to force the corresponding jaw upon the bolt and effectually prevent any unseasonable loosening thereof. When the chuck has grasped the bolt, the feeding-arm is retracted by the reversal of the driving mechanism to its normal position.

On the shaft b' is located a friction-clutch F′, consisting, essentially, of an inner head F^2, provided with a hub F^3, keyed upon said shaft. Thus this head has a fixed engagement on the shaft b and always rotates therewith. Over this inner head is located a shell F^4, made in two parts f f', having a movable or loose engagement upon said hub, and which may be tightened upon the inner head, as desired, by means of screws f^2, uniting the parts f f'. Between the shell F^4 and the inner head and on either side of said head are placed two washers f^3 f^4, of leather or other suitable material. As so constructed it is evident that the shell will slip when the strain overcomes the friction of the shell upon the inner head. Upon this shell the gear b^2 is engaged, which rotates the gear B^3, actuating the shafts B^6 B^7 when the clutch is operative. To limit the movement of the feeding-arms, the shafts upon which they are engaged are provided with stops C^6, arranged to strike upon a corresponding stop C^7, so located as to receive the impact of the former stop on the downward movement of the arm when it has reached the desired point. The consequence is to cause the slipping of the shell F^4 upon the head F^2 until the driving mechanism is reversed.

G and G′ are cross-heads, having a reciprocatory movement upon the frame A by means of the feed-screw engaged therewith, the cross-heads being duplicates one of the other and carrying duplicate mechanism for holding and actuating the screw-threading dies and cutters. Each cross-head is preferably provided with a double set of die and cutter-mechanisms to facilitate the operation of cutting the threads.

G^2 and G^3 denote bed-plates, having a later-

ally-movable engagement on the underlying cross-head to allow the dies and cutters to be retracted from and advanced to the work. To this end the bed-plates may have a dove-tailed engagement on the cross-head, as shown at *g*.

H and H′ represent a set of die-heads mounted on said bed-plates and having a movable engagement thereupon. To guide the movement of the die-heads, the frame A is provided with guide-plates J, constructed with a guideway J′ and guide-flanges J^2 J^3 J^4, said guide-plate being, preferably, made with double guideways and flanges to operate each set of die-heads at each end of the machine.

It will be seen that the two cross-heads G G′ are located between the two chucks D D′, and that when they reciprocate they move in opposite directions to carry the dies and cutters to the work. Consequently on the guide-plates the guide flanges and ways are correspondingly formed and arranged. The die-heads are each provided with a guide-lug H^2, constructed and arranged to move in the corresponding guideway of the guide-plate, thereby to direct the course of the die-head as desired. The guide-flange J^2, it will be seen, constructed with an angular face adjacent to the guideway, forces the corresponding die-head inward as the cross-head moves longitudinally. The flange J^3 holds the die-head to the work while the dies and cutters are doing their work. The flanges J^4 direct the die-heads away from the work.

H^3 and H^4 represent a set of dies engaged with the die-head H H′, respectively, arranged to cut the threads on the body of the bolt.

K and K′ denote cutter-heads engaged upon the bed-plates G^2 G^3, carrying cutters K^2 K^3, arranged to cut the threads on the beveled point of the bolt. These cutters are preferably removable to allow different kinds of cutters to be employed. In this way single or multiple threads can be cut upon the points, as may be desired.

K^4 denotes a set-screw to hold the cutters in place in the cutter-head. It is found desirable to give to the cutter-heads a yielding movement. Accordingly they have each a jointed engagement with the corresponding die-head, as shown at K^5, a spring K^6 being provided to keep the cutter to its normal position. It is also found advisable to locate the die on the one side of the bolt so as to cut above the horizontal center of the bolt, and the other die so as to cut on the under side of the bolt. To this end the die-heads H and H′ are arranged one as an upper die-head and the other the lower die-head. So, also, the cutters are arranged in a corresponding manner, and the cutter-heads are likewise arranged one as an upper cutter-head and the other as the lower cutter-head. In so arranging the die-heads and cutter-heads it will be convenient to have the jointed union of the cutter-heads with the die-heads, the one above and the other below the bed-plates G^2 G^3. In Fig. 8, therefore, the jointed union is shown above and in Fig. 9 it is shown below, the two heads being formed with bracket-arms *h k*, at the extremities of which is the jointed union K^5 to allow for the yielding of the cutter-head. The cutter-heads are provided at their outer ends with guide-rollers K^7 to form a movable contact with the side of the adjacent guide-plate, said plate at the side being provided with a lateral guide-strip J^5, secured thereto, and preferably adjustable thereon. As the roller rides along the face of the guide-strip it will be moved inward or outward thereby, and the movement of the underlying bed-plate may carry the roller outward and away from contact with said strip. The die-heads are provided with jaws *h′* to engage the bolt on either side toward the extremity to be threaded and hold it firmly. The cross-heads G and G′ are held in suitable adjustment with each other, so that each will move the required distance, by an adjusting-screw G^5, threaded in opposite directions, by rotating which the cross-heads will be moved nearer together or farther apart, as required, to regulate their position in accordance with the length of the bolt to be threaded. As so constructed and arranged, it is evident that the dies and cutters feed back laterally to open and release the bolt and feed forward to close upon the work. As shown, the cutters are arranged so that their cutting-edges lie at an angle to the dies, so as properly to engage the beveled point. Moreover, the operation and relation of the chuck and the cutting mechanism one to the other is such that just before the opening of the dies the chuck springs back into normal position, allowing the bolt to drop. The dies are also so arranged that one cuts a little in advance of the other.

L denotes the belt-shifting bar, provided with devices *l* to engage the belts and with movable collars *l′* engaged thereupon. By the proper adjustment of these collars the shifting-bar is thrown a longer or shorter stroke.

L′ is a rod engaged upon the adjacent cross-head and provided with adjustable collars l^2, the adjustment of which determines the length of the threaded portion to be cut on the bolt.

L^3 is a transverse rocker-bar provided with weighted arms L^4 L^5.

L^6 is a slotted arm on the rocker-bar, through which the rocker-bar passes, extending upward to be engaged by the collars *l′*. It is clear that when the cross-head moves in one direction one of the collars l^2 will strike the slotted arm L^6 and carry it toward a vertical position and past the center of gravity. When past the center, the weighted arm on the same side the center will quickly rock the slotted arm over, causing its extremity to strike the opposite collar on the shifting-bar, and thereby throwing the shifting-bar accordingly, reversing the motion. Upon this tak-

ing place the shifting mechanism will operate in like manner in the opposite direction, and so alternately reverse the motion.

The chucks D D′ each consists of a head D^2, having a reciprocatory movement upon the shaft b', said head constructed with an annular peripheral groove d and with jaws D^3, pivotally engaged within the head, as shown at d', and projecting forwardly therefrom. The shaft b', upon which the chuck is mounted, is channeled, as shown at b^7 b^8, the channels being beveled at their forward ends, as shown in Fig. 22, and provided with a point b^9 to project forward between the front end of the jaws to force the bolt out of engagement therewith, the shaft at the rear end of the point constructed with beveled faces b^{10}. The jaws are also formed with beveled faces toward their forward ends, as at d^2, and with recesses d^3, having an angular form at the rear, as shown in Figs. 19 and 22. As so constructed it is evident that as the head D^2 is reciprocated on the shaft the jaws will be opened at their forward extremity as the head is retracted to allow the bolt to drop therefrom, the rear of the jaws being forced downward into the channels b^7 b^8. A contrary movement will correspondingly contract the forward ends of the jaws ready to engage the head of the bolt. At their forward ends the jaws are preferably constructed with their proximal faces of angular form, arranged, as shown in Fig. 20, to engage the square head of the bolt when the chuck is moving, whatever may be the shape in which the head is presented to said jaws. The angular faces of the jaws are provided with oppositely-extended angles d^4 d^5, against the faces of which the head of the bolt engages, and is thereby prevented from turning in the operation of threading. In this manner the jaws need not clamp the bolt rigidly, but are open in the movement of the head to allow the head of the bolt to drop upon the said ledges and be held thereby. The head is held upon the shaft from turning independent thereof by grooving the sides of the shaft and constructing the head with ribs entering said grooves, as shown at d^6. The special construction of the chuck forms the subject-matter of separate claims in an accompanying application filed of even date herewith.

The head D^2 is reciprocated in the following manner.

I denotes a carriage having a reciprocatory engagement with the frame A. The carriage is provided with an upwardly-extended shoulder I′, formed with lateral arms i i', constructed to engage the annular groove d of the chuck.

I^2 is a locking-bar constructed with a beveled face i^2 and shoulder i^3 at its forward end and pivoted to the frame, as at i^4. The cross-heads G G′ are provided with a lifting-lug g, so arranged that when the head has moved sufficiently toward the carriage the lug lifts the locking-bar.

M′ is a shaft engaged upon the carriage, provided with a retracting-spring M^2 to thrust the carriage back to its normal position when the locking mechanism is released. This shaft M′ has a sliding engagement in the adjacent cross-head G′, as in an orifice g^2, Fig. 4. Two rods N N′ engage the carriage and have a sliding engagement in a cross-beam A^2 of the frame, as shown in Figs. 5 and 6. These bars prevent the chuck being carried too far in the direction of the work.

While I have thus far described my invention as adapted for a screw-cutting machine, it will be seen that the same is adapted equally well as a screw or bolt pointing machine.

By removing the cutters K^2 and K^3 and introducing into the cutter-heads K K′ straight-edged cutters a conical point can be cut on the screw or bolt, and I design this modification and use of the machine as coming within the scope of my invention.

O, Fig. 2, denotes an oil-tank provided with oil-ducts O′ to lead the oil to the dies.

To allow the dies to cut well up to the head of the bolt the jaws h' may be removed, in which case it will be necessary to hold the bolt until the dies have a firm engagement therewith. To do this I provide means whereby the feeders may retain a longer hold upon the bolt after the chuck has taken hold thereof. Thus, for example, the gears B^4 B′ may be loosely mounted upon their respective shafts and said shafts be provided with disks R, rigidly engaged upon the shaft, provided with an arm r'. The gears B^4 B^5 are provided with lugs r, against which said arms may engage. It will be seen that the gears, as represented in connection with the gear B^5 in Fig. 5, may have a loose motion until the lug r engages the arm r', when the disk and its shaft will be rotated. This permits the feeders to remain at the point of delivery while the gears B^4 B^5 are making the rotation to engage the lug r with the arm r'. By that time the dies have a firm engagement with the work.

The cross-heads G G′ and the chucks and related mechanism are preferably arranged to operate alternately at the two ends of the machine.

In operation the bolts are fed into the chutes E′ by an assistant, where they slide down, as shown in Figs. 23 and 25. The feeding-arms then swing up, and each takes a bolt from its respective chute and carries it down and deposits it in its respective chuck. The die-heads then move forward and their cutters cut the threads, after which they move back and the chucks open and let the bolts fall out. In the meantime the feeding-arms have returned to the chutes and each has received another bolt, which it carries to the chuck

and deposits, as before, and the die-heads again move forward and cut the threads. In this manner the only manual labor required is to feed the bolts to the chutes, as the machine does the rest of the work automatically.

What I claim as my invention is—

1. In a screw cutting and pointing machine, the combination of a rotary chuck for holding the work, a feeding device to deliver the work to the chuck, reciprocating die-heads and cutters, and mechanism to actuate the chuck and feeding device, substantially as described.

2. In a screw cutting and pointing machine, the combination of a chuck for holding the work, a feeding device provided with a stop, a second stop for engaging with said stop, and a rotatable shaft carrying the feeding device, said feeding device having a limited movement on said shaft, substantially as described.

3. In a screw cutting and pointing machine, the combination of a chuck to hold the work, feeding devices to deliver the work to the chuck, dies and cutters to thread the body and the point of the work, and reversible driving mechanism, substantially as described.

4. In a screw cutting and pointing machine, the combination of a chuck to hold the work, a lock for said chuck, and threading mechanism to cut the threads on the body and point of the work in one operation, substantially as described.

5. In a screw cutting and pointing machine, the combination of a reciprocatory rotatable chuck to hold the work, suitable die-heads and cutters for engaging with the work, and feeding devices to deliver the work to the chuck, substantially as described.

6. In a screw cutting and pointing machine, the combination of a reciprocatory rotatable chuck, suitable die-heads and cutters for engaging with the work, said chuck provided with movable jaws, said jaws constructed with angular proximal faces, and means for operating the jaws and for delivering the work to the chuck, substantially as described.

7. In a screw cutting and pointing machine, the combination of a rotatable reciprocatory chuck to hold the work, a reciprocatory carriage engaging said chuck, a locking device to hold the carriage while the work is being threaded, and a releasing device, substantially as described.

8. In a screw cutting and pointing machine, the combination of a supporting-frame, a reciprocatory cross-head, a die-head movable on said cross-head, and a guide-plate to direct the movement of the die-head, substantially as described.

9. In a screw cutting and pointing machine, the combination of a supporting-frame, a chuck to hold the work, longitudinally and laterally reciprocatory dies and cutters, locking devices to hold the dies and cutters to their work, and releasing mechanism to permit the retraction of the dies and cutters, substantially as described.

10. In a screw cutting and pointing machine, the combination of a chuck to hold the work, longitudinally and laterally reciprocatory heads, dies and cutters engaged with said heads, said cutters set at an angle to the dies to thread the point of the work, substantially as described.

11. In a screw cutting and pointing machine, the combination, with a supporting-frame, of chucks to hold the work located thereupon, a pair of movable cross-heads each provided with dies and cutters to thread the body and point of the work in one operation, feeding devices to deliver the work to said chucks, and feeding-arms and driving mechanism to actuate the chucks, cross-heads, and feeding devices, substantially as described.

12. In a screw cutting and pointing machine, the combination, with a supporting-frame, of movable cross-heads, movable dies and cutters located thereupon, and a guide-plate to control the movement of the dies and cutters, substantially as described.

13. In a screw cutting and pointing machine, the combination, with a chuck, of a feeding device to deliver the work to the chuck, a stop to limit the movement of the feeding device, reversible driving mechanism to actuate the chuck and feeding devices, and a clutch connected with the driving mechanism to throw the feeding mechanism out of gear when its movement is limited until the driving mechanism is reversed, substantially as described.

14. In a screw cutting and pointing machine, the combination, with a supporting-frame, of cross-heads movable thereupon and adjusting mechanism to control the movement of said cross-heads, substantially as described.

15. In a screw cutting and pointing machine, the combination, with a supporting-frame, of movable cross-heads having dies and yielding cutters located upon said cross-heads, substantially as described.

16. In a screw cutting and pointing machine, the combination of a chuck to hold the work, a feeding device to deliver the work to the chuck, a feeding-chute to deliver the work to the feeding device, and means located adjacent to said chute to bind the feeding device upon the work, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

EDWARD PHILLIPS.

Witnesses:
CHAS. R. SAVILLE,
H. A. PASSOLT.