

A. J. BRAUN.

MACHINE FOR POINTING AND THREADING BOLTS.

No. 427,732.

Patented May 13, 1890.

Fig. 1

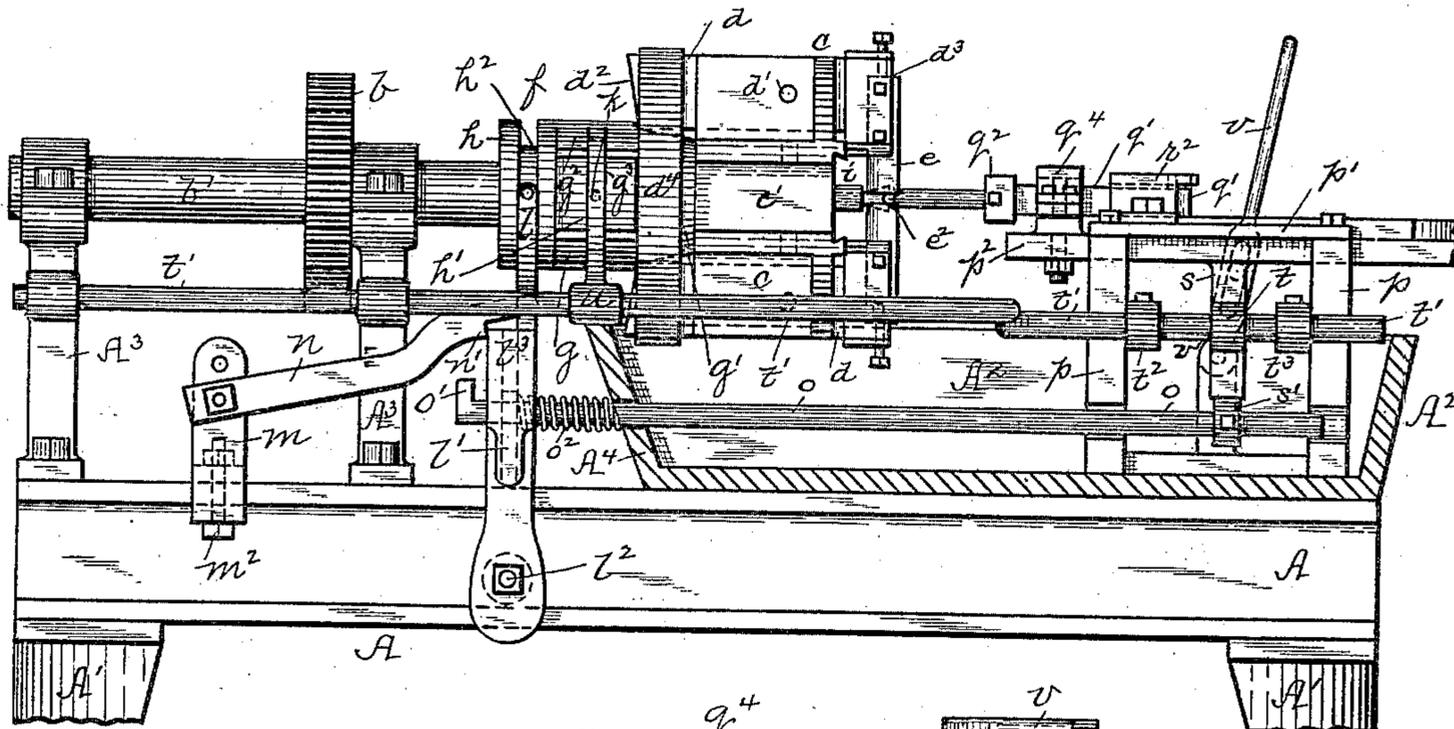


Fig. 3

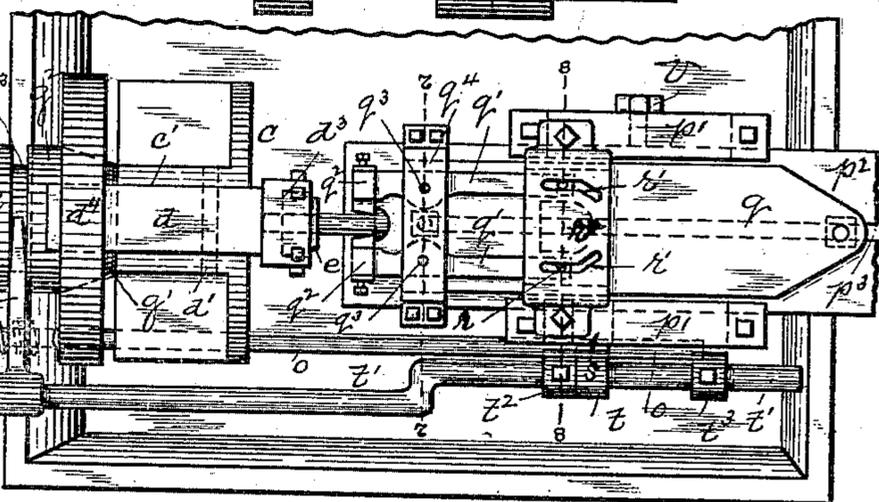
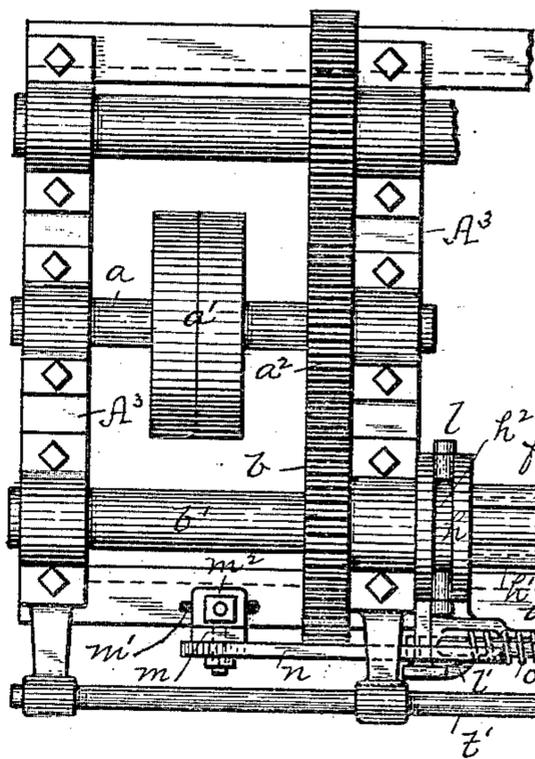
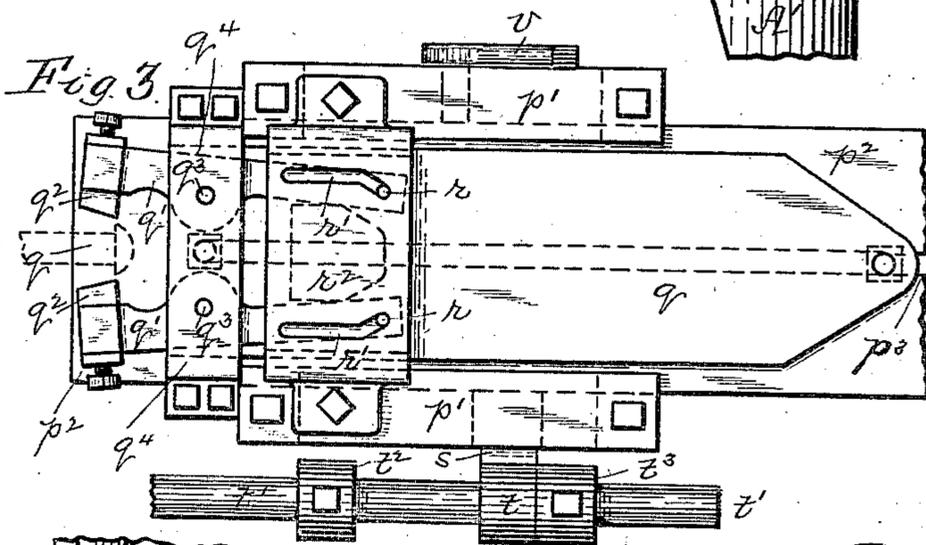


Fig. 2.

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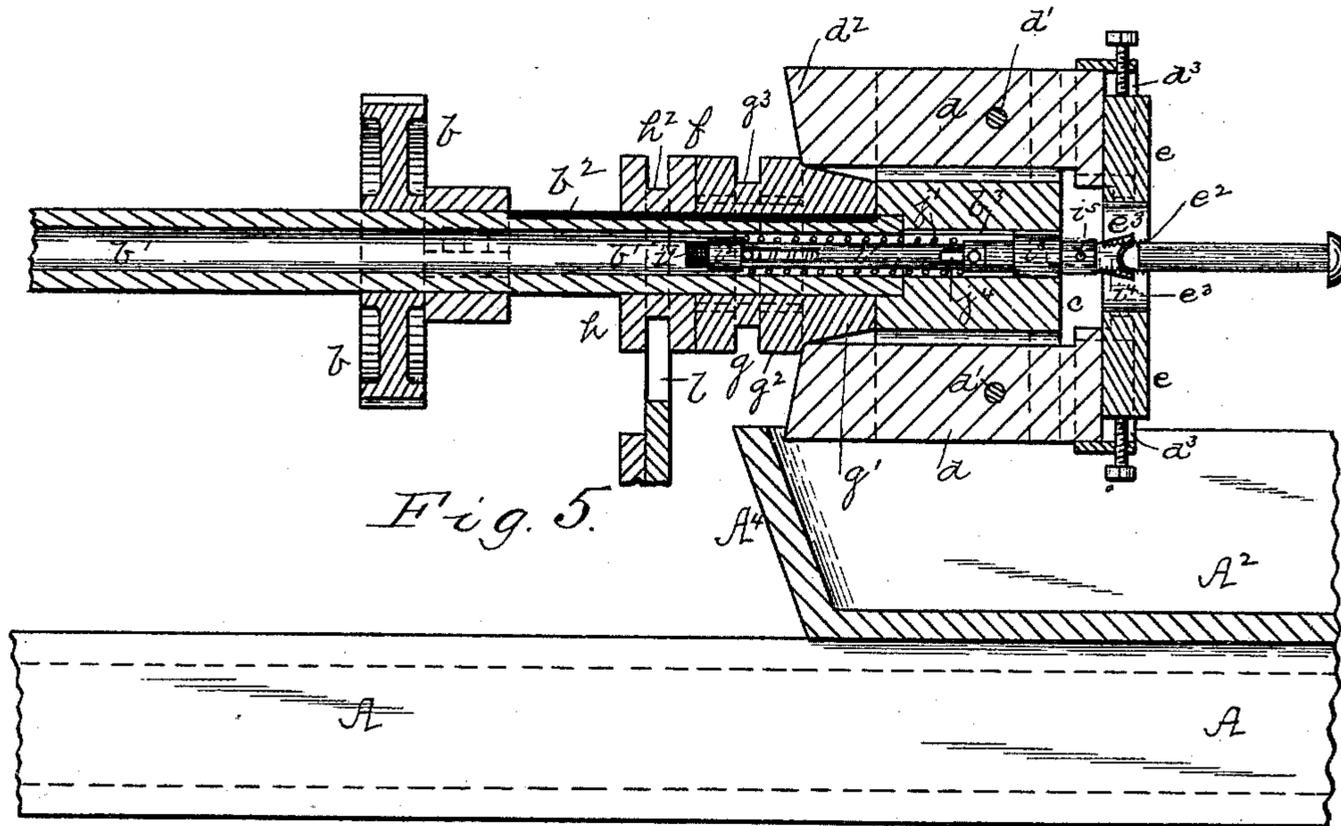
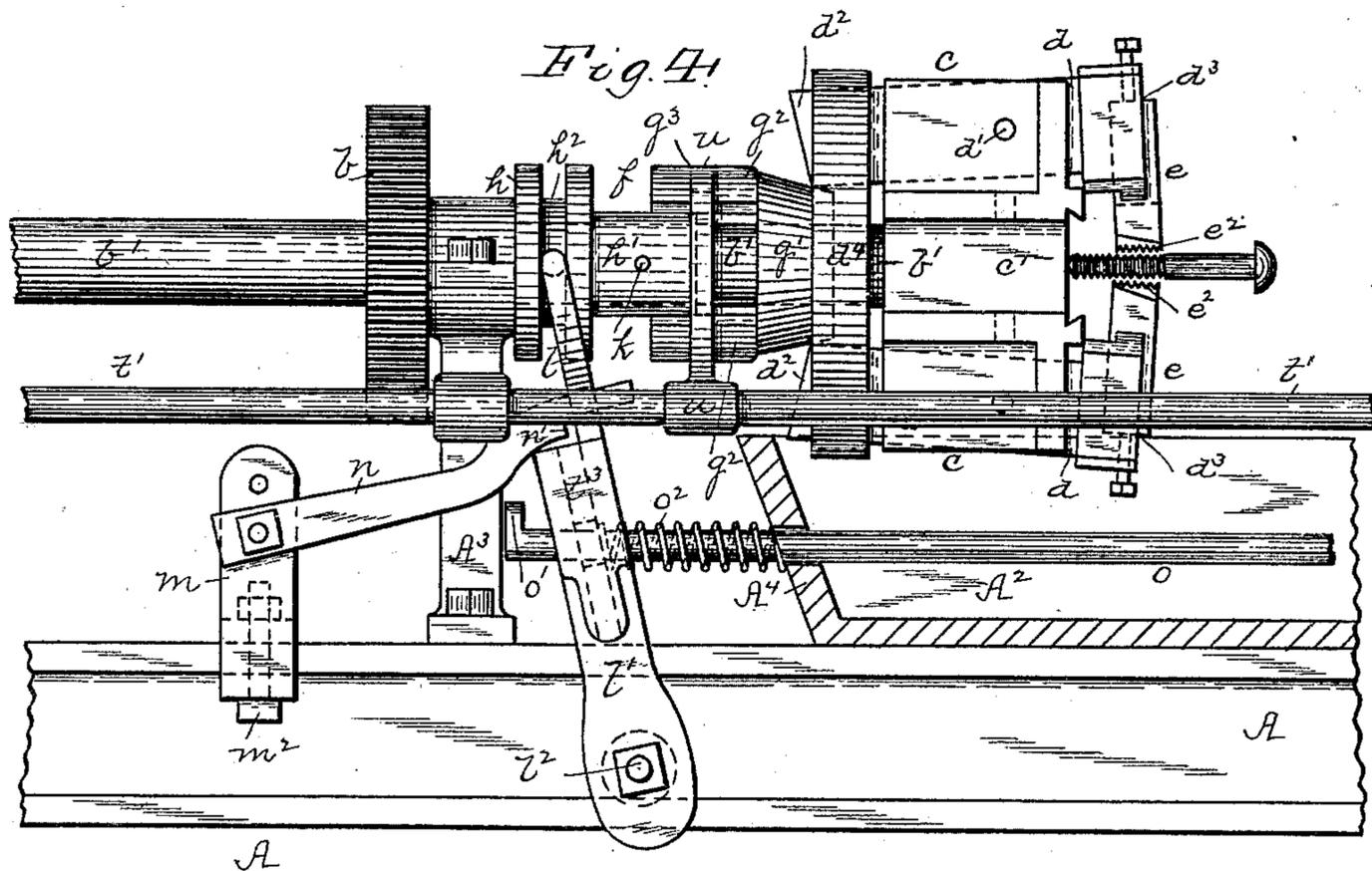
Witnesses:
 J. H. Coakley
 Robt. D. Lott

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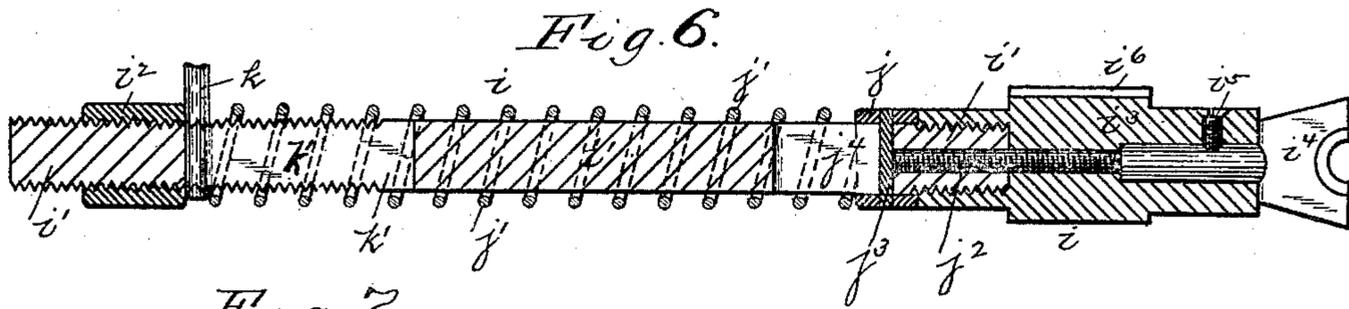


Fig. 7.

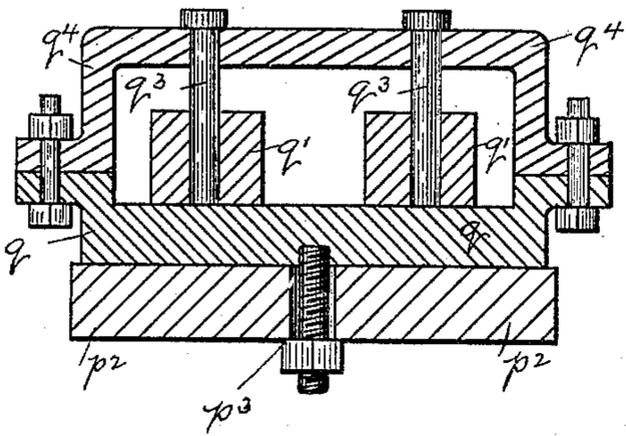


Fig. 8.

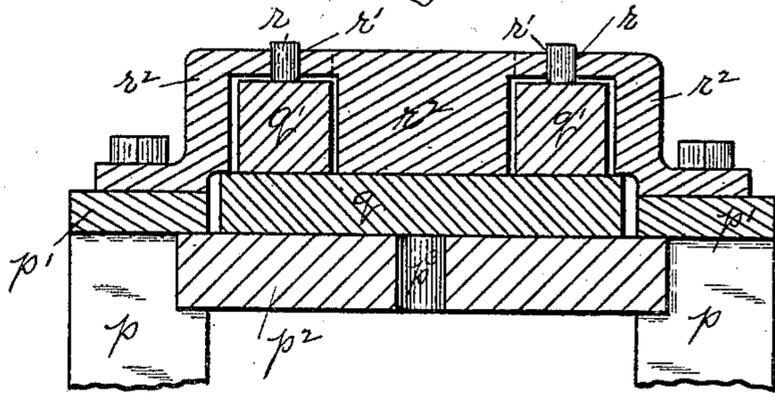


Fig. 9.

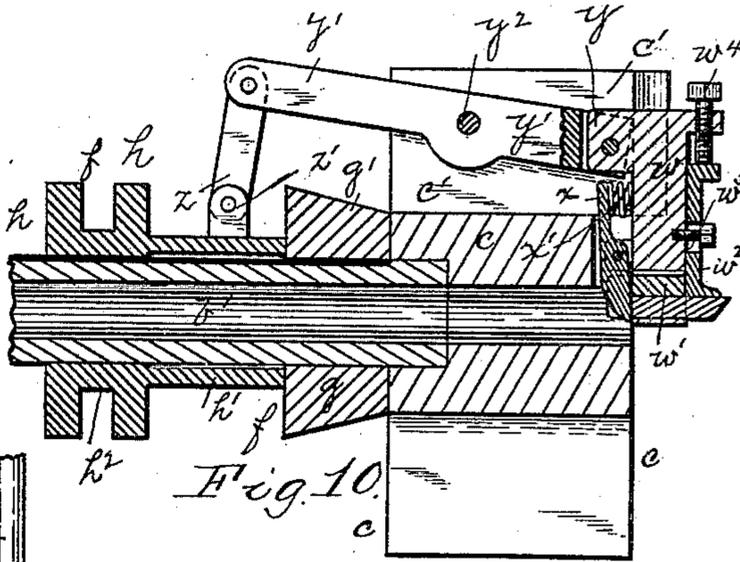
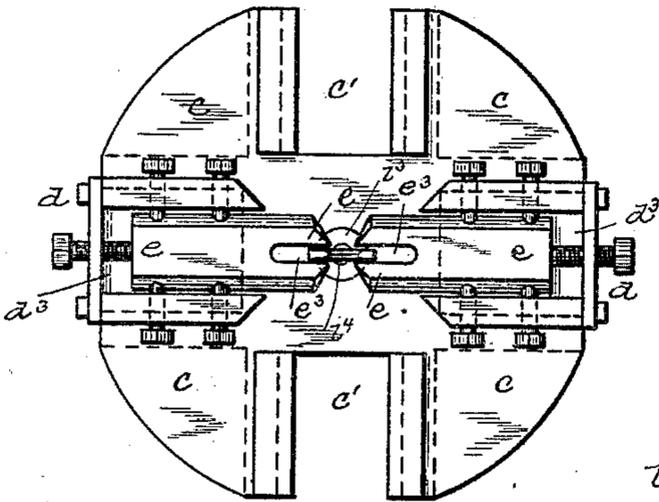
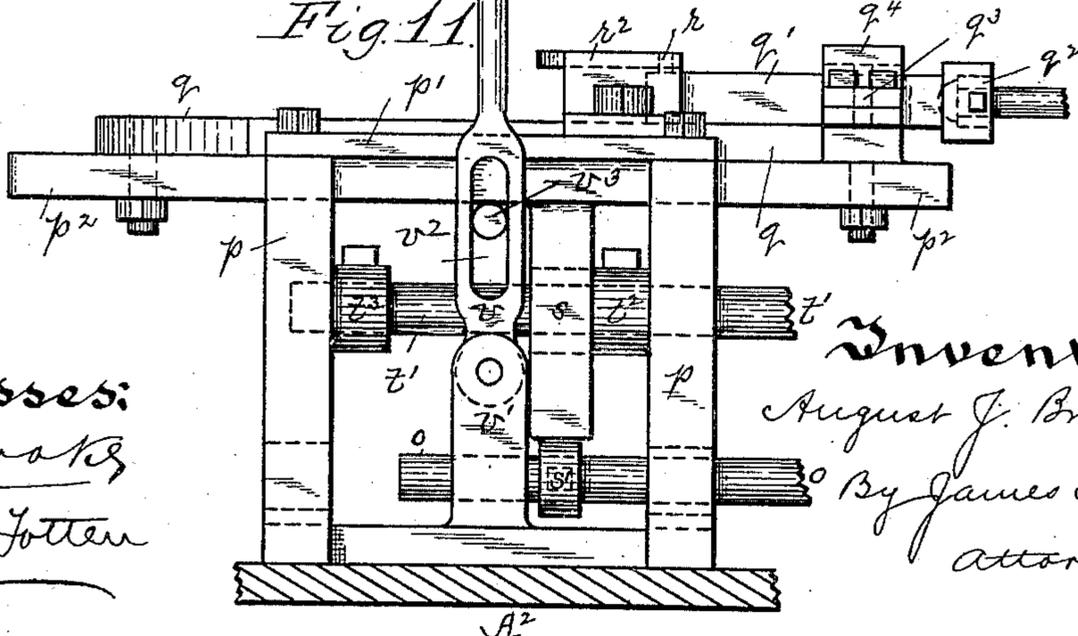


Fig. 10.

Fig. 11.



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UNITED STATES PATENT OFFICE.

AUGUST J. BRAUN, OF PITTSBURG, PENNSYLVANIA.

MACHINE FOR POINTING AND THREADING BOLTS.

SPECIFICATION forming part of Letters Patent No. 427,732, dated May 13, 1890.

Application filed November 29, 1889. Serial No. 331,879. (No model.)

To all whom it may concern:

Be it known that I, AUGUST J. BRAUN, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Pointing and Threading Bolts; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the pointing and threading of bolts, its object being to provide a form of apparatus in which the blank is pointed and threaded by the use of one set of dies without the necessity of removing or changing the position of said blank until the finished bolt is produced.

My invention comprises a form of apparatus in which the blank is fed to a set of revolving screw-threading dies and at the same time to a pointing-knife adapted to revolve with said threading-dies, and mechanism for withdrawing said knife when the blank has been pointed, while the threading operation may continue until the blank has been threaded the required amount.

My invention comprises, further, certain improvements and combination of parts, all of which will be more fully hereinafter set forth and claimed.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a side view of my improved machine, showing the blank in position for the pointing and threading operation. Fig. 2 is a plan view showing the position of the parts when the blank has been pointed and partly threaded. Fig. 3 is a plan view of the feeding device, showing the gripping-jaws open. Fig. 4 is an enlarged view of the rear portion of the machine, showing the threading-dies open. Fig. 5 is an enlarged longitudinal section of the hollow spindle, showing knife-carrier therein. Fig. 6 is an enlarged section of knife-carrier. Fig. 7 is a cross-section on the line 7 7, Fig. 2. Fig. 8 is a cross-section on line 8 8, Fig. 2. Fig. 9 is a face view of the die-head, showing position of knife. Fig. 10 is a modified form of knife-carrier, and Fig. 11 is a view of the means of operating the sliding plate of the feeding device.

Like letters indicate like parts.

The whole apparatus may be mounted upon any suitable frame, that shown in the drawings being well suited for the purpose. It consists in the frame A, supported by the standards A', with a box or pan A², situated at the forward end of the frame A. Journaled in cross-bars A³ of the frame is the central driving-shaft *a*, having the pulley *a'* thereon, which, being connected by means of a belt to a power-driven shaft, revolves said shaft *a*.

A pinion *a*² on the shaft *a* gears with a pinion *b*, mounted on the hollow spindle *b'*. Though several of these spindles together with the threading and pointing devices may be mounted on the same frame and operated from the single shaft *a* by proper gearing, I will confine my description to the operation of a single device. The hollow spindle *b'* is journaled in the cross-bars A³ of the frame and has secured thereto the circular die-head *c*. Around this circular die-head *c* are arranged the seats *c'*, and within said seats are pivoted the levers *d* by the pins or bolts *d'*. The rear portions of the levers *d* are slightly inclined, as at *d*², and at the forward end of said levers are the seats *d*³, within which the threading-dies *e* are secured by set-screws. Only two of these levers *d*, carrying the threading-dies *e*, are shown, although four may be used, if necessary. The threading-dies *e* have the threading-jaws *e*² and the recesses *e*³ formed therein, said recesses *e*³ extending beyond the jaws *e*², so that when the dies are in position these recesses *e*³ will be opposite each other for the reception of the blade of the pointing-knife, as shown in Fig. 9. A band-spring *d*⁴ surrounds the circular die-head *c* at its rear portion and tends to force the rear portions *d*² of the levers *d* toward each other, while the other ends, carrying the dies *e*, are forced apart.

Directly back of the die-head *c* upon the hollow spindle *b'* is the double clutch-cone *f*, consisting of two distinct parts, which will be hereinafter termed the "threading-cone" and "knife-clutch," respectively. These parts are adapted to revolve with the hollow spindle *b'*, being secured thereto by the feather *b*², which engages with corresponding grooves formed within the double clutch-cone *f*, while said parts have also a longitudinal movement back and forth on the hollow spindle. The thread-

ing-cone g has the cone-face g' , which serves, when in engagement with the inclined portions d^2 of the levers d , to force the threading-dies e toward each other. The threading-
 5 cone g has also the clutch-face g^2 and the annular groove g^3 . The knife-clutch h forms the second part of the double clutch-cone f , and when in connection with the threading-cone g a clutch-face h' engages with the
 10 clutch-face g^2 of said threading-cone g . An annular groove h^2 is also formed upon the knife-clutch h .

Within the hollow spindle b' is the knife-carrier i , said knife-carrier, as shown in Fig.
 15 6, consisting of the spindle i' , threaded at or near its ends, a sleeve i^2 , fitting on one end, and a knife-holder i^3 on the other end, said knife-holder having a suitable seat therein, within which the pointing-knife i^4 is secured
 20 by means of the set-screw i^5 . The knife-holder i^3 has the groove i^6 formed thereon, which engages with the feather b^3 within the hollow spindle, whereby the knife-carrier i revolves with said hollow spindle and at the
 25 same time has a longitudinal movement therein. Interposed between the sleeve i^2 and a collar j upon the spindle i' is the coiled spring j' . When the knife-carrier i is in position within the hollow spindle b' , a pin or
 30 bolt k passes through the knife-clutch h , through a slot in the hollow spindle b' , and finally through the slot k' , formed in the spindle i' , and so connects the knife-cone h with the knife-carrier i .

In order to increase the tension of the spring j' , a set-screw j^2 passes through the knife-holder i^3 and presses against a pin j^3 in the collar j , which extends through a slot j^4 in the spindle i' , so that by tightening up said set-screw the collar j is forced back along the
 40 spindle i' , compressing the spring j' against the pin or bolt k . A forked arm l engages with the annular groove h^2 of the knife-clutch h , said forked arm being bolted to or cast integral with the rocking lever l' . The rocking
 45 lever l' is pivoted on a suitable stud or bearing l^2 , extending out from the frame A . In the rear of the rocking lever l' and in line therewith is the pivotal arm m , resting in a
 50 slot m' or other suitable guide in the frame A and adapted to be clamped at any point within said slot by the set-screw m^2 . Pivoted to the pivotal arm m is the lever n , upwardly inclined at its forward end and having
 55 the shoulder n' thereon, adapted to engage with the shoulder l^3 of the rocking lever l' . A rod o , which will be hereinafter termed the "knife-clutch rod," passes through openings in the rocking lever l' and the end wall A^4
 60 of the box A^2 and extends to the feeding device, in which it is properly journaled, as will more fully hereinafter appear. On the rear end of the knife-clutch rod o is the lug o' , and between the rocking lever l' and the wall A^4 is
 65 interposed the coiled spring o^2 . The lug o' serves to raise the lever n to release the shoulder n' from engagement with the shoul-

der l^3 of the rocking lever l' when the knife-clutch rod o moves toward the lever n , the spring o^2 acting to throw back the rocking
 70 lever.

The device for feeding the blank to the threading-dies is situated within the box A^2 and in line with the threading-dies. This device consists of the standards p , having bear-
 75 ings therein for supporting the knife-clutch rod o , the guides p' , secured to said standards p , and the sliding plate p^2 , arranged to move back and forth in said guides. A slot p^3 is
 80 formed in the sliding plate p^2 , and clamped within said slot at any desired point therein is the plate q . Levers q' , similar to the levers
 85 d in the die-head c and carrying the gripping-jaws q^2 , are pivoted to the forward end of the plate q by pins q^3 , which pass down through a cross-piece q^4 , secured to the plate q . When
 90 the levers q' are pivoted in place, the gripping-jaws q^2 will face each other and are arranged to receive the head of the blank to be threaded.

In order to hold the blank securely in place during the pointing and threading operation, it is necessary for the inner ends of the levers
 95 q' to be held apart, which will act to force the gripping-jaws q^2 into contact with the head of the blank. For this purpose pins or studs
 100 r , secured to the inner ends of the lever q' , extend up through the slots r' in the guide-piece r^2 , said guide-piece having no movement with the sliding plate p^2 , being secured
 105 to the guides p' . A cone-shaped lug is cast on the inside of the guide-piece r^2 between the slots r' and serves to assist in guiding the levers q' . From this construction it is ap-
 110 parent that when the pins r are in the parallel portions of the slots r' the gripping-jaws q^2 will be forced into contact with the head of the blank; but when the plate q recedes the pins r will travel back in the slots r' , as shown
 115 in Fig. 3, and as soon as they reach the curved portions of said slots the ends of the levers q' will be drawn toward each other, releasing the blank from the gripping-jaws and allow-
 120 ing it to drop therefrom.

Secured to the sliding plate p^2 is the bearing-piece s , the lower portion of said bearing-
 125 piece having the bearing s' , through which the knife-clutch rod o passes, being secured therein by a set-screw. By this arrangement of parts the knife-clutch rod o moves with the
 130 sliding plate p^2 back and forth.

Above the bearing s' on the bearing-piece s is the guide t , through which the threading-cone rod t' passes. Collars t^2 t^3 are arranged
 135 on the threading-cone rod t' , one on each side of the guide t , and may be held at any distance therefrom by set-screws. A forked lever u is secured to the threading-cone rod t' at a point thereon opposite to the annular
 140 groove g^3 of the threading-cone g , the forked portion of said lever fitting in said annular groove, so that any longitudinal movement imparted to the threading-cone rod t' will carry the forked lever u in the same direc-

tion, together with the threading-cone. The sliding plate p^2 may be moved back and forth by the hand-lever v , said lever v being pivoted to the lug v' , and said lever v having the slot v^2 therein, into which the pin or stud v^3 enters, secured to the sliding plate p^2 . When the lever v is thrown forward, the sliding plate p^2 will advance toward the threading-dies, while the double clutch f will be thrown back on the hollow spindle b' .

In Fig. 10 a modified form of knife-carrier is shown. This carrier consists of the block w , which is adapted to be dovetailed in one of the seats c' not occupied by the levers d . A seat is formed in the lower part of the block w for the reception of the knife-holder w' , said knife-holder having a knife therein, braced and strengthened from upward movement by the brace w^2 , having the slot w^3 therein, and a set-screw entering said slot in order to clamp the brace w^2 to the block w . A set-screw w^4 acts to force down the brace w^2 when turned in the proper direction. Pivoted on the back of the block w is the lever x , one end of said lever being in contact with the block w and the other end forced therefrom by the spring x' . Pivoted to a lug y on the upper end of the block w is the lever y' , said lever being again pivoted to the die-head c at y^2 , and, extending back, is secured to the strap z . The strap z is pivoted to a lug z' on the clutch-face of the knife-clutch h . When in position, the knife will be between the threading-dies e , and the operation of pointing will be the same as with the use of the other carrier. However, when the blank has been pointed, instead of the knife being drawn within the hollow spindle it will be drawn vertically from between the threading-dies e , for as the knife-clutch h is thrown back the rear end of the lever y' will be drawn down and the block w will be raised in its seat, carrying with it the knife. By the employment of this form of knife-carrier it is obvious that I can dispense with the use of a hollow spindle.

For the operation of pointing and threading a blank of a given size the several parts of my improved machine are first arranged in relation to each other by means of the different set-screws so that the pointing and threading operation will continue for such a length of time as may be necessary to produce the point and desired amount of threads upon the blank. The several parts, therefore, having been adjusted, and it being desired to insert the head of the blank within the jaws q^2 of the levers q , as shown in Fig. 1, the lever v is first drawn back, which causes the sliding plate p^2 to recede. Through this movement imparted to the sliding plate p^2 the pins r on the levers q' will travel back into the curved portions of the slots r' , as shown in Fig. 3, when the jaws q^2 will be forced apart sufficiently to allow the head of the blank to be inserted. When the head of the blank has been inserted within the jaws

q^2 , the lever v is shoved forward until the sliding plate p^2 advances and resumes its former position, with the pins r just entering the parallel portions of the slots r' , when the jaws q^2 will be forced into contact with the head of the blank and hold it securely in place. It will be observed that in operating the lever v for the opening and closing of the jaws q^2 the sliding plate p^2 was not moved far enough forward to act to operate the knife-clutch rod o or the threading-cone rod t' , which would result if the lever v were thrown still farther forward. The end of the blank to be pointed will now be in the position shown in Fig. 1 within the jaws e^2 of the threading-dies e . Power is applied to revolve the shaft a and through the pinions a^2 b to the hollow spindle b' . The threading of the shank of the blank now commences, and as the said blank is held stationary and the threading-dies e , together with the knife-carrier i , revolve with the hollow spindle b' , the end of the blank is forced into the jaws of the threading-dies and into contact with the pointing-knife i^4 . While the pointing operation is going on the threading-dies e are also at work upon the shank of the blank, forming the threads thereon, and the blank is fed farther into the jaws of the threading-dies, consequently forcing the end of the blank with increasing pressure against the blade of the pointing-knife i^4 . The amount of resistance which the knife i^4 can bring to bear against the force of the blank fed to it is regulated by the tension of the spring j' , which may be increased or diminished by turning the screw j^2 in the proper direction. The blank gradually overcomes the resistance of the spring j' , and the knife-carrier i is forced into the hollow spindle b' , the pin k , which connects the knife-clutch h with said knife-carrier, moving forward in the slot k' , and thereby contracting the spring j' by forcing it against the collar j . Meanwhile the sliding plate p^2 has been advancing in its guides toward the threading-dies e , carrying with it the knife-clutch rod o , until the lug o' comes in contact with the lever n , and by raising said lever disengages the shoulder n' from the shoulder l^3 of the rocking lever l , as shown in Fig. 4. The spring o^2 is allowed to expand and acts to throw back the rocking lever l , together with the knife-clutch h , moving on the hollow spindle b' , and the knife-carrier i within said hollow spindle. The knife i^4 is in this way withdrawn from contact with the blank, and the further threading of the shank of the blank may be continued for a period to be regulated by the position of the collars t^2 t^3 upon the threading-cone rod t' . These collars t^2 t^3 are so adjusted by means of the set-screws that as the sliding plate p^2 advances the guide t will not reach the collar t^2 until the knife-clutch rod o has operated to throw back the knife-clutch h and knife-carrier i , or for such a length of time thereafter as may be required for the

further threading of the blank. This may be accomplished by moving the collar t^2 forward on the rod t' . As soon, therefore, as the guide t , moving with the sliding plate p^2 , comes in contact with the collar t^2 it will carry the threading-cone rod t' with it. This movement on the part of the rod t' in connection with the forked lever u will throw back the threading-cone g , when the band-spring d^4 will act to draw in the end portions of the levers d and force apart the threading-dies e to release the shank of the blank. In order to release the head of the blank, which has been held securely in place during the threading operation, and to allow the finished bolt to drop to a suitable receptacle below, the lever v is drawn back until the pins r travel back into the curved portions of the slots r' , Fig. 3, when the gripping-jaws q^2 will be opened and the head released. In drawing back the lever v still farther, and with it the sliding plate p^2 , the rods t' and o travel back in the same direction until the threading-cone g and knife-clutch h connected thereto resume their former position to form the double clutch-cone f and the threading-dies e are closed. The lever n drops down and the shoulder n' engages with the shoulder l^2 of the rocking lever l' to hold the knife-cone h in position. The knife-carrier i will also resume its former position with the knife in position for another pointing operation. Another blank is then inserted in the gripping-jaws q^2 and the lever v forced forward to close said gripping-jaws q^2 around the head of said blank, when the same operation of pointing and threading is repeated.

By the above-described method and apparatus the pointing and threading of the blank may be carried on without the necessity of removing the blank or changing its position until the finished bolt is produced.

It is readily apparent that the several parts of the machine may be adjusted by the different set-screws, according as it is desired to reduce or increase the sharpness of the point of the bolt or the amount of threads on the shank.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine for pointing and threading bolts, the combination of a set of revolving screw-threading dies, a pointing-knife in line with said threading-dies and revolving therewith, and mechanism for drawing back the pointing-knife from the blank when the blank has been pointed, substantially as and for the purposes set forth.

2. In a machine for pointing and threading bolts, the combination of a set of revolving screw-threading dies, a pointing-knife between the jaws of said threading-dies and revolving therewith, a device for feeding the blank to said threading-dies and pointing-knife, and connections between said feeding device and pointing-knife, whereby said knife is drawn back from the blank when the blank

has been pointed, substantially as and for the purposes set forth.

3. In a machine for pointing and threading bolts, the combination of a set of revolving screw-threading dies, a pointing-knife between the jaws of said threading-dies and revolving therewith, a device for feeding the blank to said threading-dies and pointing-knife, and connections between said feeding device and the pointing-knife and threading-dies, whereby said knife is first drawn back from the blank and afterward the jaws of the threading-dies opened to release the finished bolt, substantially as and for the purposes set forth.

4. In a machine for pointing and threading bolts, the combination, with a revolving spindle, of a die-head secured thereto carrying threading-dies movable thereon, a pointing-knife, a double clutch-cone mounted on said spindle, one part thereof being connected to the threading-dies and one part to the pointing-knife, a device for feeding a blank to the threading-dies, and connections between said double clutch-cone and feeding device for sliding said double clutch-cone back and forth on the revolving spindle, substantially as and for the purposes set forth.

5. In a machine for pointing and threading bolts, the combination, with a revolving spindle, of a die-head carrying threading-dies and a pointing-knife, and a double clutch-cone mounted on said spindle and revolving therewith, said double clutch-cone consisting of a threading-cone and knife-clutch engaging with each other by clutch-faces and adapted to move independently of each other upon said spindle, substantially as and for the purposes set forth.

6. In a machine for pointing and threading bolts, the combination, with a revolving spindle, of a die-head carrying threading-dies and a pointing-knife, a double clutch-cone on said revolving spindle, said double clutch-cone consisting of a threading-cone and knife-clutch, and separate connections between said threading-cone and knife-clutch, whereby said threading-cone and knife-clutch may be moved back and forth on the spindle independently of each other, substantially as and for the purposes set forth.

7. In a machine for pointing bolts, the combination, with a hollow revolving spindle, of a clutch mounted thereon and revolving therewith, a knife-carrier secured within said hollow spindle, connections between said knife-carrier and said clutch, and mechanism for drawing back said knife through said clutch, substantially as and for the purposes set forth.

8. In a machine for pointing and threading bolts, the combination, with a revolving spindle, of a die-head carrying threading-dies, mounted on said spindle and revolving therewith, a double clutch-cone secured to said spindle, one part thereof engaging with the threading-dies and the other with the pointing-knife, a feeding device, and connections

between the threading-cone of said double clutch and said feeding device, whereby said threading-cone may be moved back and forth to operate the threading-dies independently of the knife-clutch, substantially as and for the purposes set forth.

9. In a machine for pointing and threading bolts, the combination, with a revolving spindle, of a die-head carrying threading-dies and mounted upon said spindle, a double clutch-cone on said spindle, one part of which engages with the threading-dies, the other part being connected to the knife-carrier, a lever engaging with the knife-clutch and pivoted to the machine-frame, a shouldered lever engaging with said clutch-lever, and a longitudinally-moving rod engaging with said shouldered lever and acting to disengage it from said clutch-lever, substantially as and for the purposes set forth.

10. In a machine for pointing and threading bolts, the combination, with a spindle, of a die-head carrying threading-dies and mounted on said spindle, a double clutch-cone on said spindle, one part of which engages with the threading-dies, the other part being connected to the knife-carrier, a lever engaging with the knife-clutch and pivoted to the machine-frame, a shouldered lever engaging with said clutch-lever, and a longitudinally-moving rod passing through said clutch-lever and engaging with said shouldered lever, and a spring confined between said shouldered lever and the machine-frame and acting to force back said knife-clutch, substantially as and for the purposes set forth.

11. In a machine for pointing and threading bolts, the combination of a hollow revolving spindle having a die-head thereon, a knife-carrier moving longitudinally within said hollow spindle and having a slot therein, a knife-

clutch on said hollow spindle and connected to said knife-carrier by a pin passing through said slot, and a spring confined between said pin and the forward end of the knife-carrier, substantially as and for the purposes set forth.

12. In a machine for pointing and threading bolts, the combination of a hollow revolving spindle having a die-head thereon, a knife-carrier moving longitudinally within said hollow spindle and having a slot therein, a knife-clutch on said hollow spindle and connected to said knife-carrier, a pin passing through said slot, and a spring confined between said pin and an adjusting-collar on the forward end of said knife-carrier, and a screw within said knife-carrier for adjusting said collar and regulating the tension of the spring, substantially as and for the purposes set forth.

13. In a machine for pointing and threading bolts, the combination of a rotating head carrying threading-dies therein, said threading-dies having grooves formed therein, and a pointing-knife entering within said grooves and between the threading-jaws of the threading-dies, substantially as and for the purposes set forth.

14. In a machine for pointing and threading bolts, a feeding device consisting of the standards p , the lever v , stud v^3 , sliding plate p^2 , the plate q , secured thereto, the levers q' , pivoted to said plate and carrying gripping-jaws q^2 , and the pins r , traveling in the slots r' , formed in the fixed guide-piece r^2 , substantially as and for the purposes set forth.

In testimony whereof I, the said AUGUST J. BRAUN, have hereunto set my hand.

AUGUST J. BRAUN.

Witnesses:

J. N. COOKE,
ROBT. D. TOTTEN.