No. 676,290. Patented June 11, 1901.

G. H. WEBB.

COACH SCREW MACHINE.

(Application filed Dec. 3, 1900.)

(No Model.) 4 Sheets—Sheet 1.

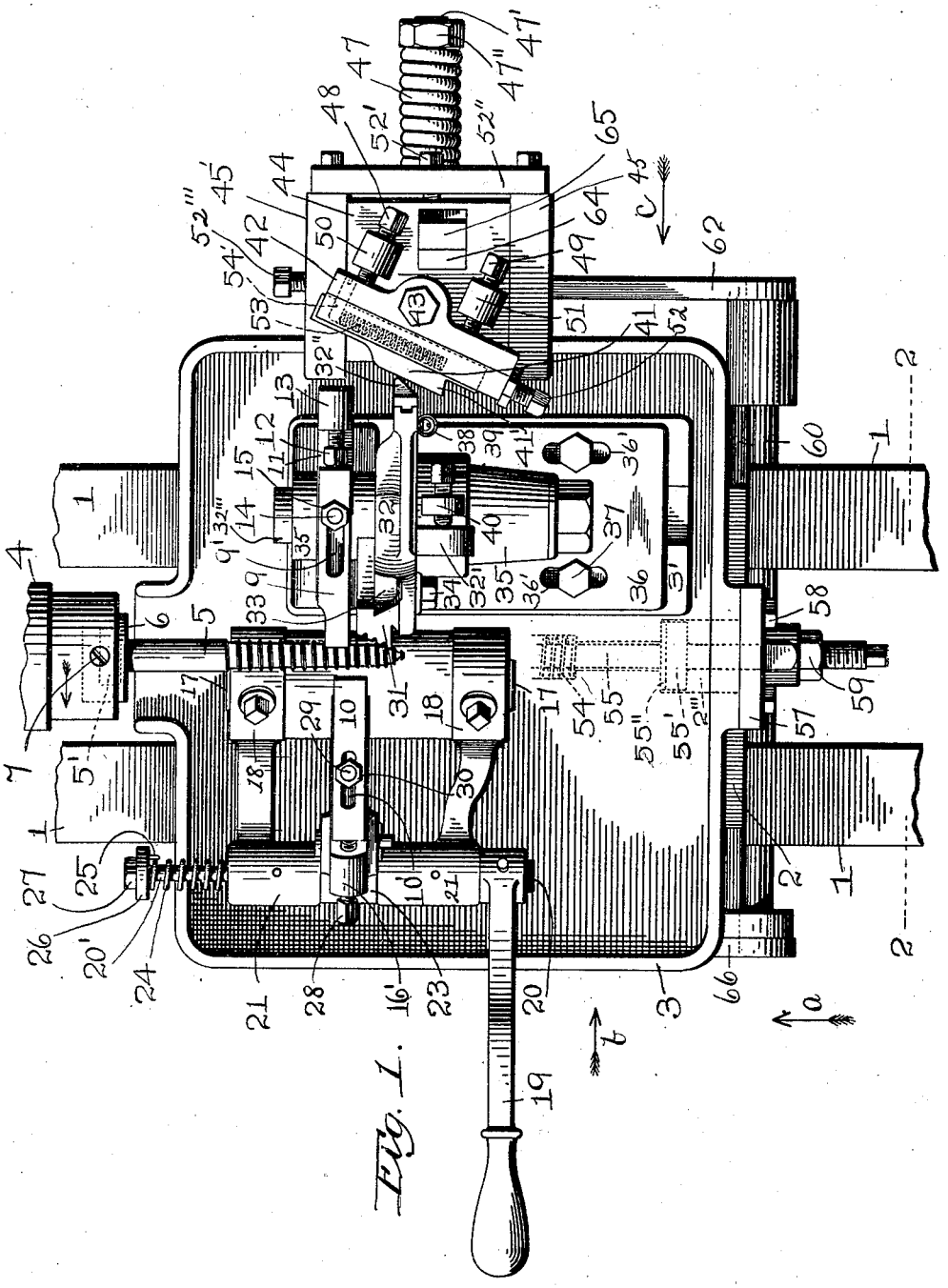

Fig. 1.

Witnesses.
C. F. Wesson.
M. Haas.

Inventor.
Geo. H. Webb.
by J. E. Dewey.
Attorney

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G. H. WEBB.

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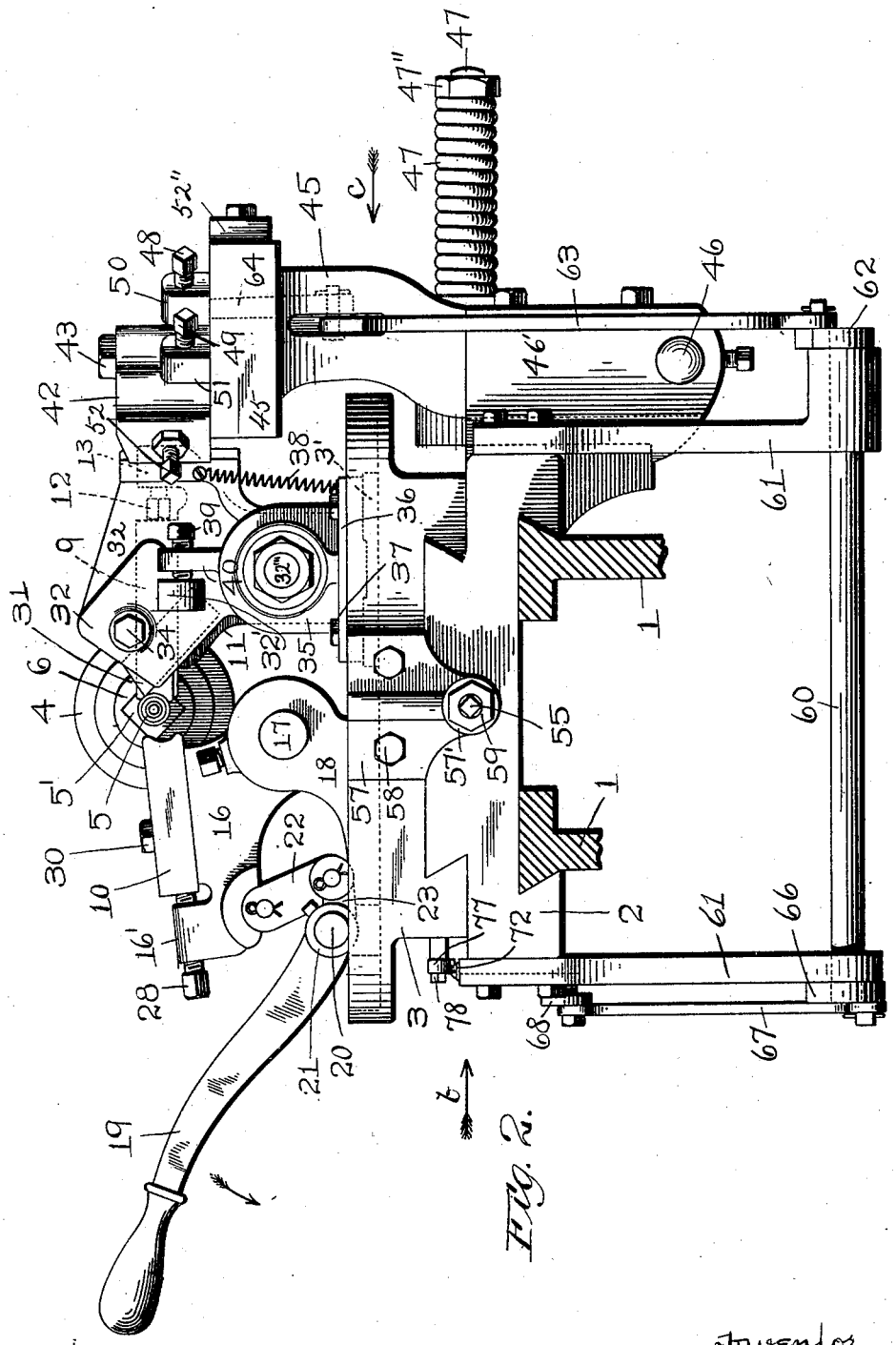

Fig. 2.

Witnesses:
C. F. Wesson
M. Haas.

Inventor.
Geo. H. Webb.
by J. C. Dewey
Attorney

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(No Model.) 4 Sheets—Sheet 3.

Fig. 6.

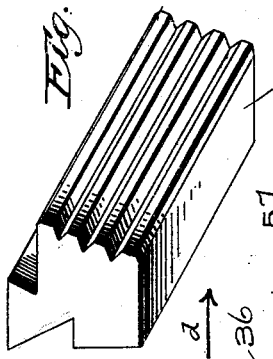

Fig. 3.

Fig. 7.

Fig. 8.

Witnesses.
C. F. Wesson
M. Haas.

Inventor.
Geo. H. Webb.
by J. L. Dewey
Attorney.

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G. H. WEBB.

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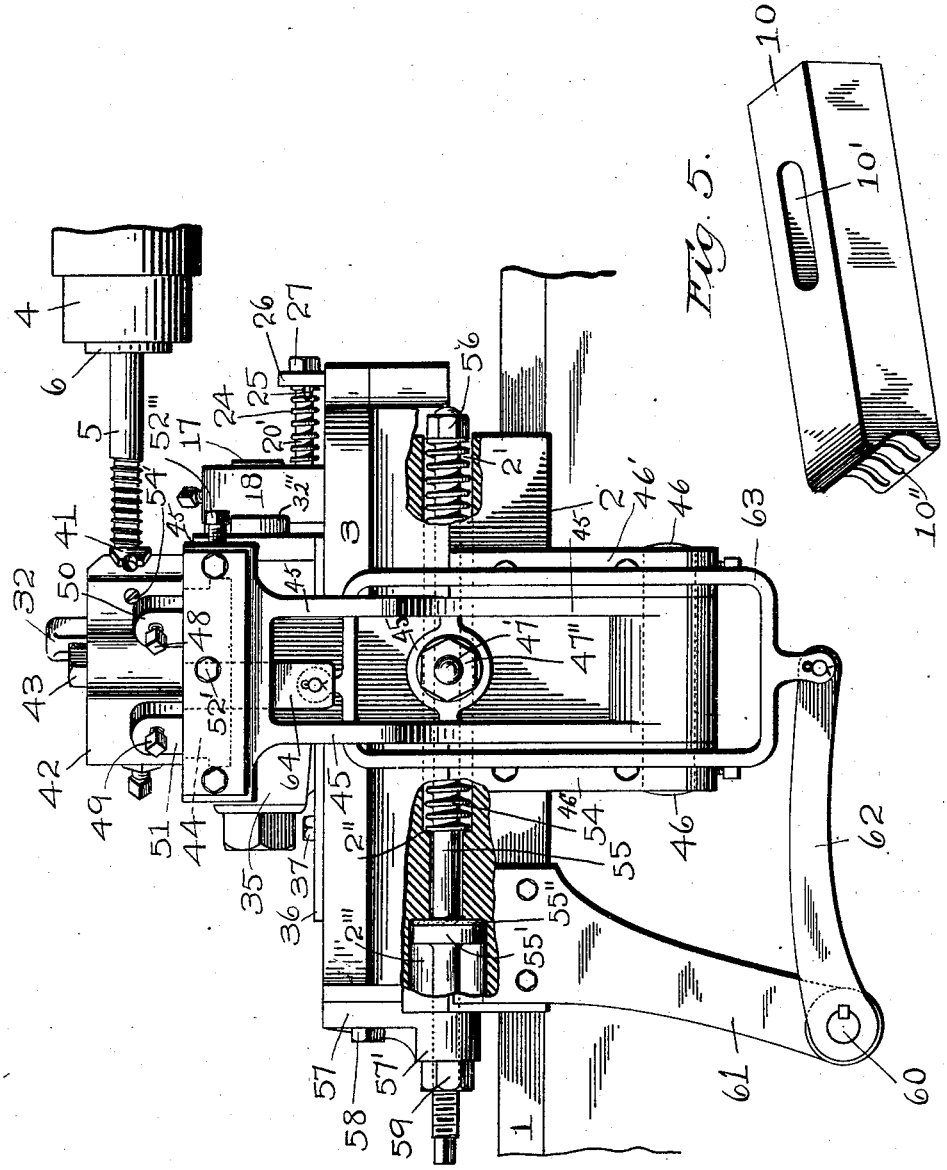

Fig. 4.

Fig. 5.

Witnesses:
C. F. Wesson.
M. Haas.

Inventor
Geo. H. Webb.
by J. L. Dewey
Attorney.

UNITED STATES PATENT OFFICE.

GEORGE H. WEBB, OF PAWTUCKET, RHODE ISLAND.

COACH-SCREW MACHINE.

SPECIFICATION forming part of Letters Patent No. 676,290, dated June 11, 1901.

Application filed December 3, 1900. Serial No. 38,591. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. WEBB, a citizen of the United States, residing at Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Coach-Screw Machines, of which the following is a specification.

My invention relates to coach-screw machines or machines for cutting the thread or making a gimlet-point on coach-screws.

In the ordinary manufacture of what are termed "coach-screws," which are metal screws with square heads to be screwed into wood, the blank from which the screw is made is first pointed, then the blank threaded with a thread of uniform diameter as far as the conical point by means of cutting-dies, and then the conical point threaded or a gimlet-point made thereon by a cutter or threading-tool. The above involves three separate operations, and ordinarily three separate machines are used for making the coach-screw from the plain headed blank. My present invention relates only to the third operation and to a machine for cutting the thread or making a gimlet-point on the blank conical point of the coach-screw.

The object of my invention is to provide improved means, embodied in an organized power-machine which is substantially automatic in its operation, to cut the thread or make a gimlet-point on the blank conical point of the coach-screw, as will be hereinafter described; and my invention consists in certain novel features of construction of my machine, as will be hereinafter fully described.

Referring to the drawings, Figure 1 is a plan view of a machine for pointing coach-screws embodying my improvements sufficient to illustrate my invention. Fig. 2 is an end view of the parts shown in Fig. 1, taken at a point indicated by line 2 2, Fig. 1, looking in the direction of arrow *a*, same figure. Fig. 3 is a side view of parts shown in Figs. 1 and 2 looking in the direction of arrow *b*, Figs. 1 and 2. Fig. 4 is an opposite side view of the parts shown in Fig. 3 looking in the direction of arrow *c*, Figs. 1 and 2. A part of the machine is broken away for clearer illustration. Fig. 5 is a perspective view of one of the feeders or thread-guides detached. Fig. 6 is a perspective view of the cutter or the threading-tool detached. Fig. 7 shows a screw before the thread is cut on the pointed end, and Fig. 8 shows a screw after the thread is cut on the pointed end.

In the accompanying drawings, 1 1 are the stationary supports or stands, with their upper ends formed as ways, upon which the bed 2 of the machine is supported to have its position adjusted in the direction of the length of the ways 1 according to the length of the screws to be operated on.

Supported upon the bed 2 of the machine to have a reciprocating motion thereon in the direction of the length of the machine is the carriage 3, upon which are mounted to move with said carriage the several operating parts of the machine for cutting the screw-thread on the point of the coach-screw, as will be hereinafter described.

4 is the holder for holding the screw 5 to be operated on. The end of the holder 4 has a removable socket 6 therein, which is held in place by a screw 7. The socket 6 has a square opening therein to receive the square head 5′ on the screw 5, (see Fig. 1,) which fits loosely into said opening and is held therein by a tool in the hand of the operator, as is usual in this class of machines. A rotary motion is communicated to the holder 4 by any ordinary means to rotate the screw 5. There is no longitudinal motion of the screw.

To cut the thread on the pointed blank end of the screw 5, motion is communicated to the carriage 3, carrying the cutter or threading-tool 31, by feeders or thread-guides 9 and 10, arranged on opposite sides of the screw 5 and adapted to engage the screw-thread already cut on said screw, so that the revolution of said screw will move forward the carriage 3. The feeder or thread-guide 9 is stationary and is provided at its engaging end with a thread of suitable pitch and shape to engage the thread on the coach-screw which is to be threaded on its pointed blank end. The thread-guide 9 is adapted to be adjusted lengthwise in its supporting-stand 11 to vary the position of its threaded end according to the diameter of the screw to be operated on, in this instance by means of a bolt 12, which turns in a stand 13 on stand 11 and engages

with its head the outer end of the thread-guide 9. A bolt 14 extends through an oblong slot or opening 9′ in the thread-guide 9 and acts to hold the guide in its adjusted position in connection with the nut 15, screwed onto the end of said bolt, as shown in Fig. 1. Arranged on the opposite side of the screw 5 is the feeder or thread-guide 10, which has at its engaging end a thread 10″ of suitable pitch and shape to engage the thread on the coach-screw to be operated on. The thread-guide 10 is supported upon a stand 16, which has journals 17 mounted and turning in bearings 18 on the carriage 3, so that the stand 16, carrying the thread-guide 10, may have a pivotal motion toward and away from the screw being operated upon. Motion is communicated to the stand 16 and thread-guide 10 in this instance through a hand-lever 19, fast on a shaft 20, journaled in bearings 21, and a link 22, pivoted at one end to an arm or extension 23, fast on the shaft 20 and at its other end to the stand 16, as shown in Figs. 1 and 2.

A spiral spring 24, secured at one end to one of the bearings 21 and encircling an extended and reduced end 20′ of the shaft 20, with its end bearing against a pin 25 on a washer 26, secured on said extension 20′ by a nut 27, acts to hold the stand 16 in its rear position with the threaded end of the thread-guide 10 out of engagement with the threaded part of the screw 5 and the operating-lever 19 in the position shown in Fig. 2. The downward movement of the lever 19 in the direction of the arrow, Fig. 2, will, through the shaft 20, arm 23, and link 22, move forward the stand 16, carrying the thread-guide 10, to bring the engaging end of said guide 10 into engagement with the thread on the coach-screw 5 and act, in connection with the thread-guide 9, to clamp or hold the screw, so that the revolution of the screw will cause the carriage 3 to have a forward motion. The thread-guide 10 may be adjusted in the direction of its length by means of a bolt 28, turning in the projection 16′ on the stand 16 and engaging with its inner end the outer end of the thread-guide 10. A bolt 29, extending through an elongated slot or opening 10′ in the thread-guide 10 in connection with a nut 30, screwed onto said bolt, acts to hold the thread-guide 10 in its adjusted position.

I will now describe the cutter or threading-tool for cutting the thread on the blank point of the screw and the means for operating said cutter to cut a gimlet-point on the screw.

The cutter or threading-tool 31 has its cutting edge preferably of the shape shown in Fig. 6 and is mounted and secured in a stand 32, in this instance by means of a bar 33, extending in a recess in said stand and into a recess in the cutter. Said bar is held in place by a bolt 34, as shown in Fig. 3. The stand 32 is provided with journals 32‴, which turn in bearings 35 on the plate 36, which is adjustable lengthwise on a raised grooved part 3′ of the carriage 3 by means of bolts 37, extending through slots 36′ in the plate 36 and screwing into the raised part 3′, as shown in Figs. 1 and 2. By adjusting the position of the plate 36 the position of the cutter 31 may be adjusted according to the length of the screw to be operated upon.

A spring 38, secured at one end to the plate 36 and at its other end to the stand 32, acts to move said stand backward and to hold said stand in its rear position and in engagement with the device for moving it forward. A projection 32′ on the stand 32 is engaged by an adjusting-bolt 39, turning in a projection 40 on the bearing 35, to limit the backward movement of the stand 32 and the cutter 31.

A forward motion is communicated to the stand 32, carrying the cutter 31, and to said cutter to cause its cutting edge to gradually move forward to cut a gimlet-point on the screw by means of a cam-plate 41, held in a block 42, pivotally secured by a bolt 43 on a plate 44, which is mounted in ways 45′ at the upper end of the arm or stand 45, (see Fig. 2,) pivotally mounted at its lower end on a shaft 46 in hangers or brackets 46′, secured to the bed 2 of the machine. A closely-coiled spring 47 is supported on a stationary pin 47′, secured to the bed 2 of the machine, and, compressed between a nut 47″ on the outer end of the pin 47′ and the part 45″ of the stand 45, (see Fig. 4,) acts to yieldingly hold the stand 45 in its forward or inner position and also to hold the cutter in yielding engagement with the point of the screw during the threading operation. An adjusting-nut 52′, turning in a plate 52″, bolted to the rear upper end of the stand 45, may be used to adjust the position of the plate 44, which is secured in its adjusted position and made fast to the upper end of the movable arm or stand 45 to move with said arm by set-screw 52‴. (See Fig. 1.)

The position of the block 42, carrying the cam-plate 41, may be adjusted on its pivotal bolt 43 by means of bolts 48 and 49, turning in projections 50 and 51 on the plate 44, as shown in Fig. 1. The lengthwise position of the cam-plate 41 may be adjusted by a bolt 52, bearing against the end of said plate. A spring 53 is inclosed within a recess in the plate 41 and bears at one end against a screw 54′, extending through the block 42, as shown in Fig. 1, and acts to move forward the cam-plate 41 into position, as will be hereinafter described.

The cam-plate 41 is engaged by the projection 32″ on the stand 32, so that as the carriage 3, carrying the stand 32 and cutter 31, is moved forward in the operation of the machine the projection 32″, traveling on the cam-plate 41, as shown in Fig. 1, will move forward the cutter or threading-tool 31 against the blank point of the screw to cut a gimlet-point thereon until the projection 32″ passes by the projecting end 41′ of the cam-

plate 41, when the carriage 3 has reached its extreme forward position.

The backward or return motion of the carriage (during which the lever 19 is raised to move the thread-guide 10 out of engagement with the screw 5) is caused in this instance by means of a spiral spring 54, loosely coiled on a pin 55, which extends loosely through an opening 2′ in the bed 2 (see Fig. 4) and has a nut 56 on one end, between which and shoulders 2″ in the opening 2′ the spring 54 is compressed upon the forward movement of the carriage 3. The front end of the pin 55 is screwed into a boss 57′ on the lower part of a plate 57, secured by bolts 58 to the front side or end of the carriage 3, and is held in its adjusted position by a nut 59. The pin 55 has an enlarged circular part 55′, having a cushion-surface 55″ thereon, which in the backward movement of the carriage 3 caused by the expansion of the spring 54 strikes against the inner end of the larger opening 2‴ in the bed 2 and limits the backward movement of the carriage and also reduces the jar of the carriage on its backward movement. Upon the backward movement of the carriage 3 and parts supported thereon the cam-plate 41 is pushed back against the action of the spring 53 by the projection 32″ on the stand 32 engaging the projection 41′ on the cam-plate 41 until said projection 32″ passes by said projection 41′, when the spring 53 acts to return said plate 41 to its original position.

One of the important features of my improvements is to provide for a slight yielding or backward movement of the block 42, carrying the cam-plate 41, which communicates a forward movement to the stand 32 and cutter 31 during the operation of cutting the thread on the blank point of the screw. The block 42 is in this instance secured to the plate 44, which, as above described, is secured in the upper end of the movable arm or stand 45, pivoted at its lower end and held in its forward position by a strong closely-coiled spiral spring 47. The spring 47 allows a slight yielding or backward movement of the arm or bracket 45 at its upper end, and with it the plate 44, block 42, and cam-plate 41.

I have found in practice that if the block 42 and cam-plate 41 are rigidly held the forward movement of the stand 32 and cutter 31 must always be the same at each passage of the cutter over the point on the screw. There is no yielding of the cutter, so that in passing over the blank points of the screws, which vary some in size and thickness, it will, in case of a thicker point, tend to twist the metal rather than to remove the stock and cut the proper thread. By providing for a slight yielding or backward movement of the cutter, as above described, in case of a thicker blank point, the cutter will be forced back slightly by contact with the metal and will operate to remove the proper amount of stock in its first passage over the blank point. On its second passage the cutter will be moved forward slightly by the action of the spring 47, through intermediate connections, to remove the proper amount of stock to make the thread on the point, and on its third passage the cutter will be held in proper position by the spring 47 to smooth and finish the thread. The employment of the spring 47 or its equivalent to allow, through intermediate connections, of a slight yielding or backward movement of the cutter, particularly in its first passage over the blank point of the screw on which the thread is to be cut, is therefore a very important feature of my improvements. Said spring also acts to move the cutter forward a little more on its second passage over the point on the screw where there is not so much stock to be removed, and the spring will move the cutter still a little farther forward on its third passage over the point. Briefly, the spring 47 or its equivalent acts, in connection with the other parts of the machine, as above described, to adjust properly the position of the cutter relatively to the point on the screw to be threaded in its passage over the point.

I have found in practice that in case of large coach-screws with a coarse thread it is advantageous and desirable to give to the cutter an additional forward movement, preparatory to its second and third passage over the point to be threaded, over the gradual forward movement of the cutter above described. I have therefore provided supplemental automatic mechanism to be used, if desired, in connection with the mechanism above described to move the cutter nearer the screw, so that during the second and third operations of the cutter on the point of the screw its position during the cutting operation will be nearer to the screw than during the first operation and at the same time the gradual feed or movement of the cutter toward the screw will be the same at each of the three operations of the cutter. In this instance the plate 44 has communicated to it a movement which carries the cam-plate 41, supported thereon, forward at regular intervals and for a predetermined distance to give to the stand 32 and the cutter 31, carried thereon, an additional forward movement preparatory to cutting the thread on the point of the coach-screw at the second and third forward movements of the carriage 3, and then the plate 44 and cam-plate 41 are returned to their extreme backward position and the operation is repeated. I will now describe the mechanism employed in this instance to communicate the forward movement above referred to to the cam-plate 41.

A shaft 60 is mounted in hangers 61 below the bed 2 of the machine and has fast on one end a lever 62, to the free end of which is pivotally attached the lower end of a loop-lever 63. (See Fig. 4.) To the upper end of the loop-lever 63 is pivotally attached the lower end of a bar 64, which is made slightly wedge-

shaped or tapering toward its upper end (see Fig. 2) and extends through an opening in the plate 44 and bears against the end of said opening and a stationary block 65, (see Fig. 1,) so that as said bar 64 is gradually raised the plate 44 is moved inwardly or to the left in Fig. 1, carrying the cam-plate 41 with it. Upon the opposite end of the shaft 60 is fast a lever 66, the free end of which is connected by a link 67 with an arm 68, fast on the toothed disk or ratchet 69, pivoted at 70 on the bed 2 of the machine. A pawl 71 is held in engagement with the teeth on the toothed disk 69 by a spring 72 and prevents the disk from turning backward until the continued revolution of said disk 69 brings the end of the pawl 73 loose on the pivot 70 of said disk and engaged by an adjustable slotted plate 73′, secured to the disk 69 by a bolt 73″, extending through the slot 73‴, into engagement with the holdfast-pawl 71 to disengage said pawl from the teeth of the disk 69 and hold it out of engagement with said teeth. The spring 74, attached to the plate 73′, and the lever 66 act to move back the disk 69 and cause the adjustable slotted plate 76, secured to the disk 69 by a bolt 75, to engage the pawl 73 and move it out from under the point of the pawl 71. The pawl 73 now drops down to its original position, (shown in Fig. 3,) and the pawl 71, by the action of the spring 72, again engages the teeth on the disk 69.

Motion is communicated to the disk 69 to move it in the direction of the arrow (see Fig. 3) upon the return or rearward movement of the carriage 3 by a lever 77, pivoted at 78 on the carriage 3 and provided with a tooth 77′ to engage the teeth on the disk 69. The free end of the actuating-lever 77 rides on a stationary arm 79, adjustable on the bed 2 of the machine by a bolt 80, and is held in engagement with said arm by spring 81. (See Fig. 3.) Upon the forward movement of the carriage 3 in the direction of arrow *d*, Fig. 3, in the first operation of the cutter 31 the tooth 77′ on the actuating-lever 77 slides over the teeth on the ratchet 69. On the backward movement of the carriage 3, caused by the action of the spring 54, the tooth 77′ on the lever 77 engages the teeth of the ratchet 69 and gives a partial rotation to said ratchet to move it in the direction of the arrow shown thereon. The revolution of the ratchet 69 through arm 68, connector 67, lever 66, shaft 60, lever 62, and loop-lever 63 raises the bar 64 to move forward the plate 44 and cam-plate 41, so that upon the second forward movement of the carriage 3 the engagement of the cam-plate 41 with the extension 32″ on the stand 32 will move said stand and the cutter 31 a little farther forward in the second operation of cutting the thread on the point of the screw. During the second forward movement of the carriage 3, above referred to, the actuating-lever 77 will pass over the teeth on the ratchet 69. Upon the second return or backward movement of the carriage 3 the tooth 77′ will engage the teeth on the ratchet 69 and give it another partial rotation to move it a second time in the direction of the arrow thereon and through intermediate mechanism raise the plate 64 to move the plate 44 and cam-plate 41 a little farther forward, so that upon the third forward movement of the carriage 3 the stand 32 and cutter 31 will be moved a little farther forward during the third or finishing action of the cutter on the point of the screw. Upon the third return movement of the carriage 3 the rotation of the ratchet 69, caused by the actuating-lever 77, will cause the releasing-pawl 73 to engage the holdfast-pawl 71 and disengage it from the ratchet 69 and allow the spring 74 to act to return the ratchet 69 to its first position (shown in Fig. 3) and through plate 76 to move the pawl 73 out of engagement with the pawl 71, as above described, when the operation of cutting the thread on another screw is repeated. By means of the adjustable arm 79 the time of the engagement of the tooth 77′ on the lever 77 with the ratchet 69 may be varied to regulate the amount of rotation of the ratchet 69 and through intermediate connections the raising of the plate 64, as desired. It will thus be seen that on the second and third forward movements of the carriage 3 when the cutter 31 is a second and third time passed over the point of the screw in the operation of cutting a thread thereon said cutter is moved a little nearer the screw each time than it was during the first forward movement of the carriage 3 and its first passage over the blank conical point on the screw.

From the above description, in connection with the drawings, the operation of my improvements in coach-screw machines, above described, will be readily understood by those skilled in the art and briefly is as follows: The positions of the feeders or thread-guides 9 and 10 relative to the screw are adjusted according to the diameter of the screw by loosening the nut 15 and turning the bolt 12 in case of the thread-guide 9 and loosening the nut 30 and turning the bolt 28 in case of the thread-guide 10, so that when the lever 19 is moved downwardly to move the thread-guide 10 into engagement with the screw 5 said screw will be engaged by the thread-guides 9 and 10 and the revolution of the holder 4 and the screw 5 will cause the carriage 3 to have a forward motion in the direction of the length of the pointed end of the screw. The cutter 31 is adjusted in the stand 32 by means of a bolt 34, so that the cutting edge of the cutter will be in the proper position relative to the blank point on the screw to partially remove the stock to form the thread in the first operation of the cutter. The plate 36, by means of the bolts 37, is adjusted forward or backward on the raised portion 3′ of the carriage 3 according to the length of the screw to be operated on, so as to bring the cutter in proper position opposite the end of

the screw. The carriage 3 is in its backward or rear position, which is shown in the drawings. The operator then inserts the head of the screw which is to be operated on into the square opening in the socket 6 and holds the screw by a tool with one hand against the end of the feeder 9 and with the other hand grasps the lever 19, which is moved downward to bring the feeder or thread-guide 10 in engagement with the screw 5 and hold said screw between the ends of the feeders or thread-guides 9 and 10. The revolution of the screw 5, held in the revolving holder 4, will cause the carriage 3 and the parts supported thereon to move in the direction of the point of the screw, and the engagement of the projection 32″ on the stand 32 with the cam-plate 41 will gradually move said stand and the cutter 31, secured thereto, forward toward the screw to cause the cutting edge of the cutter to engage and cut out the stock on the blank point of the screw. In the forward motion of the carriage 3 the projection 32″ on the stand 32 will pass by the projection 41′ on the cam-plate 41, and after the cutter 31 has passed by the point of the screw the lever-arm 19 is raised to disengage the thread-guide 10 from the screw, as shown in Fig. 2, and the screw is held away from the end of the feeder 9 by a tool in the hand of the operator, as is usual in this class of machines, so as not to interfere with the return of the carriage. The spring 54 now acts to move the carriage 3 back to its original position, the projection 32″ forcing back the cam-plate 41 against the action of the spring 53 until it has passed by said projection, allowing the spring 53 to return the cam-plate 41 to its original position. (Shown in Fig. 1.) Upon the return movement of the carriage 3 the tooth 77′ on the lever 77 will engage the teeth on the ratchet 69 and give a partial rotation to said ratchet, and through arm 68, fast thereon, link 67, lever 66, shaft 60, lever 62, and loop-lever 63 raise the bar 64 to move forward slightly the plate 44, carrying the cam-plate 41. The lever-arm 19 is again moved down to cause the thread-guide 10 to eagage the screw 5, and there is a second forward movement of the carriage 3 to cause the cutter 31 to again pass over the pointed end of the screw and remove additional stock. The carriage 3 is again returned to its rear position through the operation of the spring 54, thread-guide 10 being again disengaged from the screw by means of the lever-arm 19. The ratchet 69 is again partially rotated through intermediate mechanism and again moves upwardly the bar 64 and communicates a slight forward motion to the plate 44 and cam-plate 41. The thread-guide 10 is again engaged with the screw 5, and on the third forward movement of the carriage 3 the cutter 31, which is moved slightly nearer the screw than on the second cutting operation, smooths or finishes the thread, and the operation of making the gimlet-point on the screw is completed. On the third backward movement of the carriage another partial movement is given to the ratchet 69, which causes the pawl 73 to engage the holdfast-pawl 71 and disengage said pawl from the teeth on the ratchet and allow the spring 74 to act to return the ratchet 69 and the pawl 73 to their first position. (Shown in Fig. 3.) The completed screw is now removed and a new screw substituted and the operation repeated.

It will be seen that my machine is entirely automatic in its operation, except that the lever-arm 19 is operated at the end of each forward motion and at the end of each return motion of the carriage 3 to move the thread-guide 10 out of engagement and into engagement with the screw.

The several parts of the machine may be adjusted so that coach-screws of different sizes may have their blank points screw-threaded.

The supplemental mechanism for giving an additional advance movement to the cutter, as above described, may be dispensed with, if desired, as in the operation of the machine with ordinary-sized coach-screws this mechanism is not required.

It will be understood that the details of construction of my improvements may be varied, if desired, and they may be used for threading the points of screws other than coach-screws, particularly mentioned herein.

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

1. In a machine for threading the points of coach-screws, the combination with a reciprocating carriage, two feeders or thread-guides thereon adapted to engage the screw to be threaded on the forward movement of the carriage, and means for moving one of said feeders into and out of engagement with the screw, and a cutter adapted to cut a thread on the blank point of the screw, and supported on a stand on the carriage, and said stand, of mechanism for gradually moving the cutter toward the screw, upon the forward movement of the carriage, said mechanism having a yielding backward movement during the operation of the cutter, and mechanism for returning the carriage to its rear position, after the cutter has operated, substantially as shown and described.

2. In a machine for threading the points of coach-screws, the combination with a reciprocating carriage, two feeders or thread-guides thereon adapted to engage the screw to be threaded, so that the revolution of said screw will communicate a forward movement to the carriage, and means for moving one of said feeders into and out of engagement with the screw, and a cutter adapted to cut a thread on the blank point of the screw, and supported on a stand on the carriage, of mechanism for gradually moving the cutter toward the screw, upon the forward movement of the carriage, and mechanism for returning the

carriage to its rear position after the cutter has operated, and additional mechanism for moving, on the backward movement of the carriage, the mechanism which moves the cutter toward the screw, to communicate an additional forward movement to the cutter, upon the next forward movement of the carriage, substantially as shown and described.

3. In a machine for threading the points of coach-screws, the combination with a rotary screw-holder, and a reciprocating carriage, two feeders, or thread-guides thereon, adapted to engage the screw to be threaded, so that the revolution of said screw will communicate a forward movement to the carriage, and means for moving one of said feeders into and out of engagement with the screw, and a cutter adapted to cut a thread on the blank point of the screw, and supported on a stand on the carriage, and means for adjusting the stand on the carriage, of mechanism for gradually moving the cutter toward the screw, upon the forward movement of the carriage, and mechanism for returning the carriage to its rear position after the cutter has operated, and supplemental mechanism for moving, on the backward movement of the carriage, the mechanism which moves the cutter toward the screw, to communicate an additional forward movement of the cutter, upon the next forward movement of the carriage, substantially as shown and described.

4. In a machine for threading the points of coach-screws, the combination with a rotating holder, and a reciprocating carriage carrying the cutter to thread the point on the screw, and said cutter, and means for operating the same, of means for communicating a positive forward movement to the carriage, by means of feeders or thread-guides engaging the main threaded part of the screw, and said feeders or thread-guides, and a spring-actuated rearward motion to the carriage, by a spring acting to move the carriage on the release of the thread-guides from engagement with the screw, and said spring, substantially as shown and described.

5. In a machine for threading the points of coach-screws, the combination with the bed adjustable on ways or tracks, and the carriage supported on said bed, and having a positive forward movement, and a spring-actuated backward movement, and thread-guides on said carriage, upon opposite sides of the screw to be threaded, and means for adjusting said thread-guides in the direction of their length, and means for moving one of said thread-guides into and out of engagement with the screw to be threaded, of a cutter to cut the thread on the blank point of the screw, yieldingly held against the point of the screw, substantially as shown and described.

6. In a machine for threading the points of screws, the combination with a reciprocating carriage, and means for communicating a positive forward movement, of means for communicating a spring-actuated backward movement, comprising a spiral spring supported on a pin, which spring is compressible between a nut on said pin and stationary shoulders in the opening in which said spring extends, and said pin secured on said carriage, and having a cushion-surface thereon to limit the backward movement of the carriage and reduce the jar of the carriage on said backward movement, substantially as shown and described.

7. In a machine for threading the points of screws, the combination with a stand supported on and moving with a reciprocating carriage, and having a pivotal motion, and a cutter supported on said stand to move therewith, of means for communicating a gradual forward movement to the cutter, and holding it in yielding engagement with the point of the screw during the threading operation, said means consisting of an arm or stand pivotally supported, and carrying a cam-plate to engage the cutter, a coiled spring on a stationary pin, compressed between a nut on said pin and said arm or stand, substantially as shown and described.

GEORGE H. WEBB.

Witnesses:
J. C. DEWEY,
M. HAAS.