

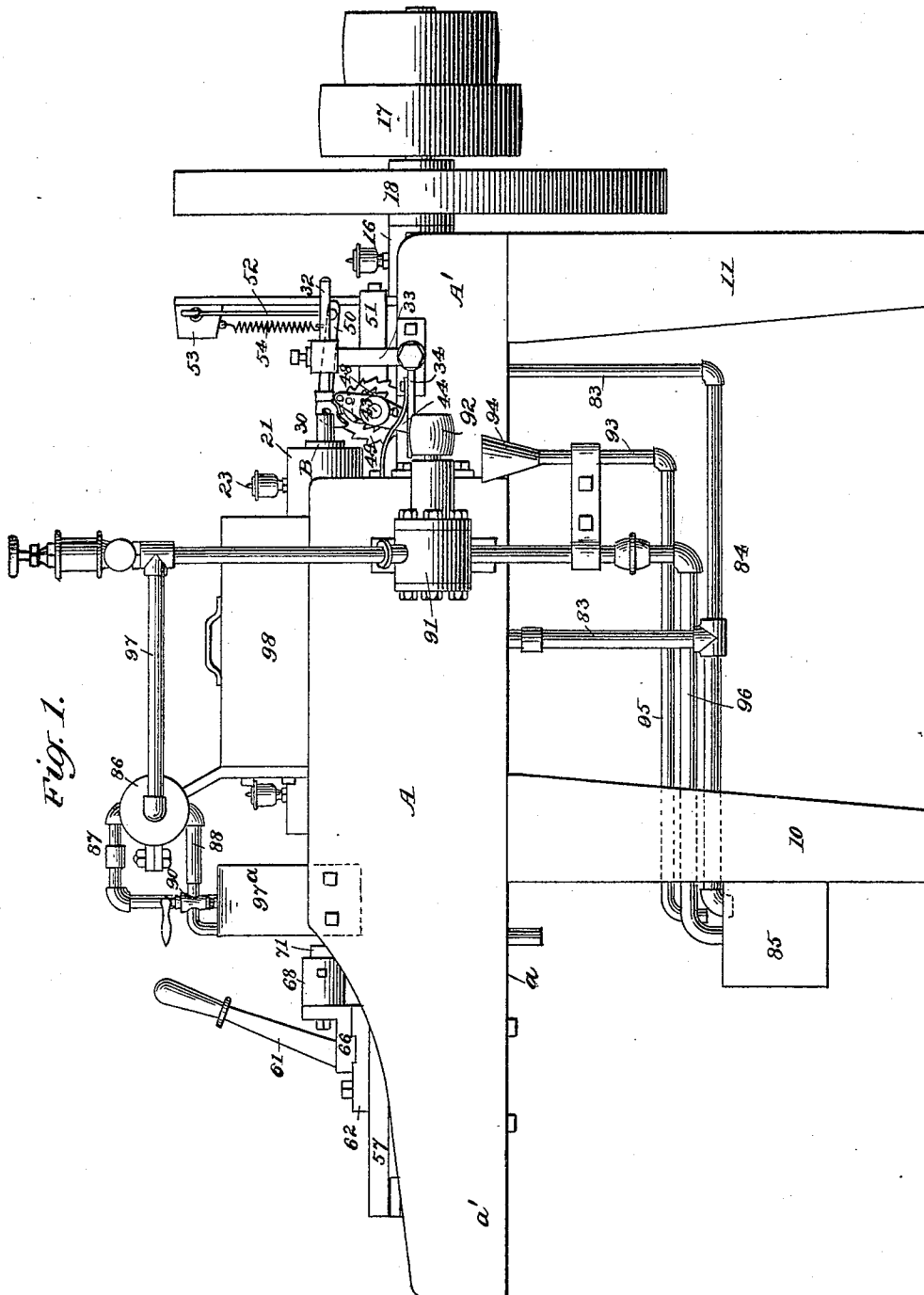
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7 Sheets—Sheet 1.

E. HUBNER.
MACHINE FOR THREADING BOLTS.

No. 459,634.

Patented Sept. 15, 1891.



WITNESSES:

J. M. Griswell.
C. Sedgwick

INVENTOR:

E. Hubner
BY Munn & Co
ATTORNEYS

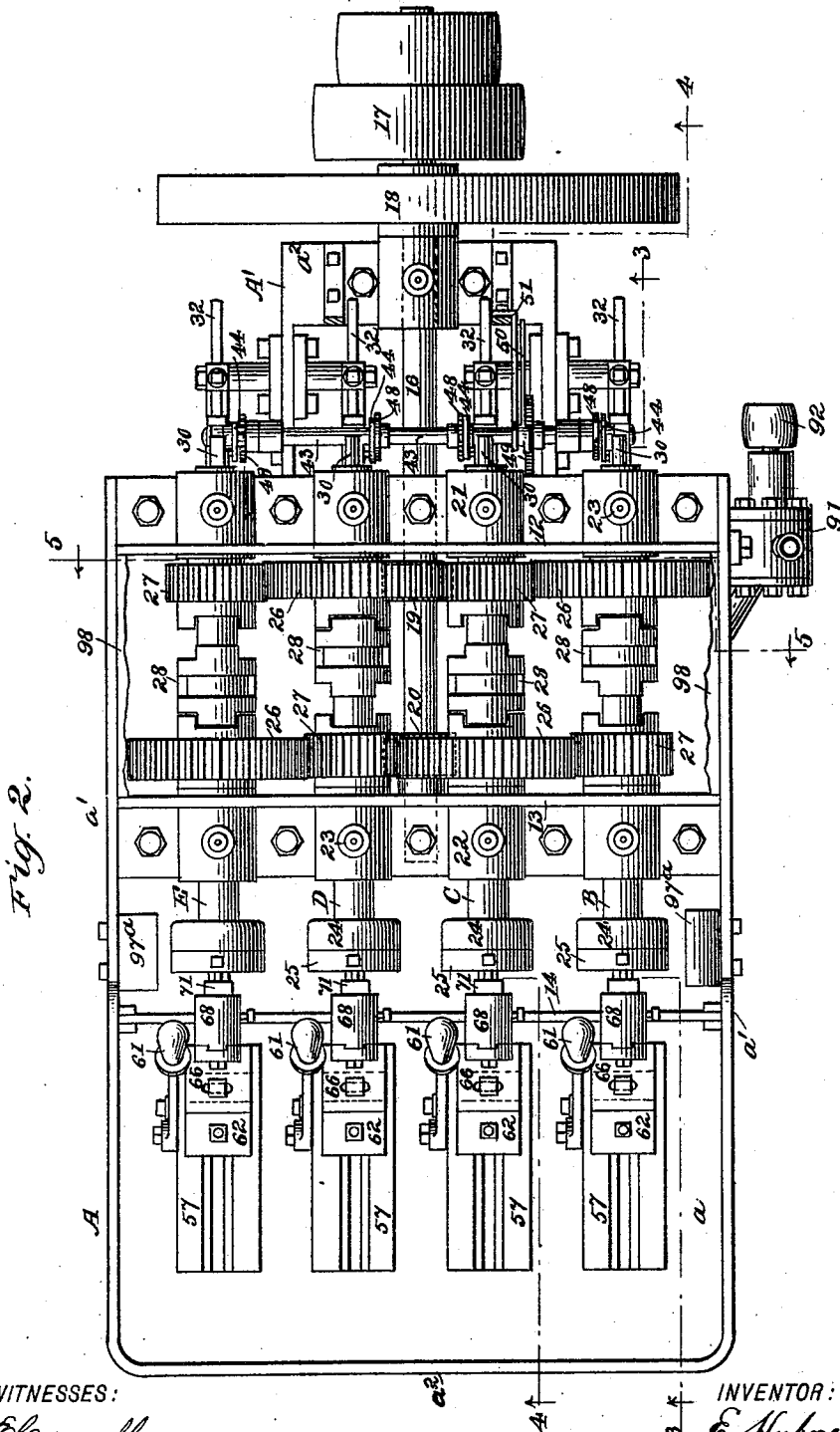
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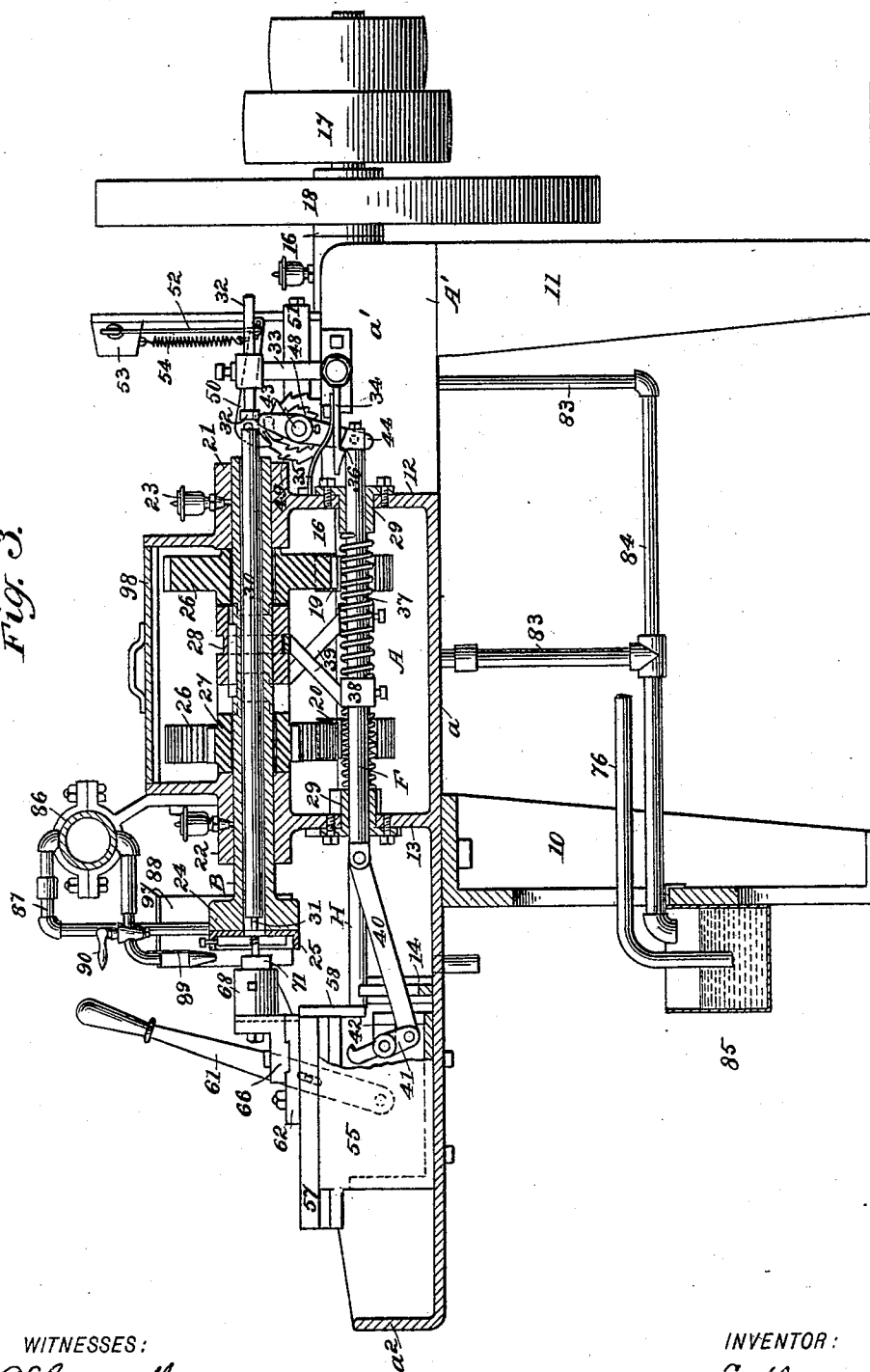
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Fig. 3.



WITNESSES:
J. M. Griswell.
W. Sedgwick

INVENTOR:
E. Hubner
BY *Munn & Co*
ATTORNEYS

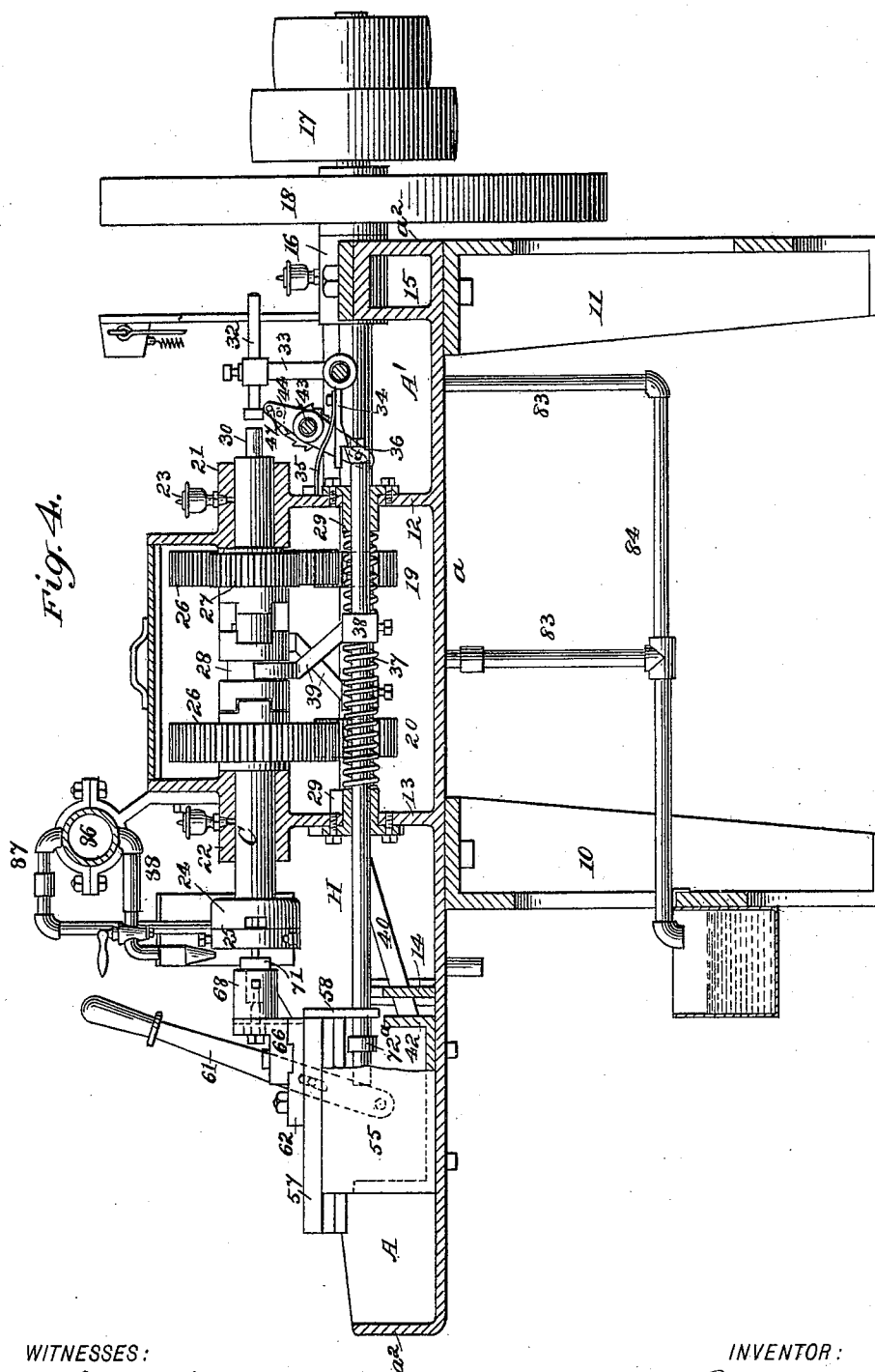
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Patented Sept. 15, 1891.



WITNESSES:

J. A. Griswell.
C. Sedgwick

INVENTOR:

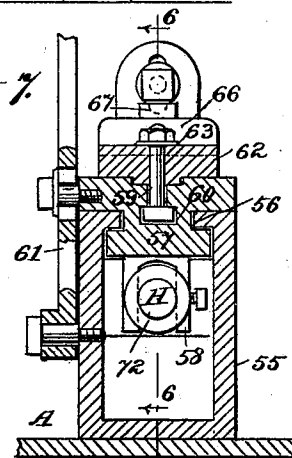
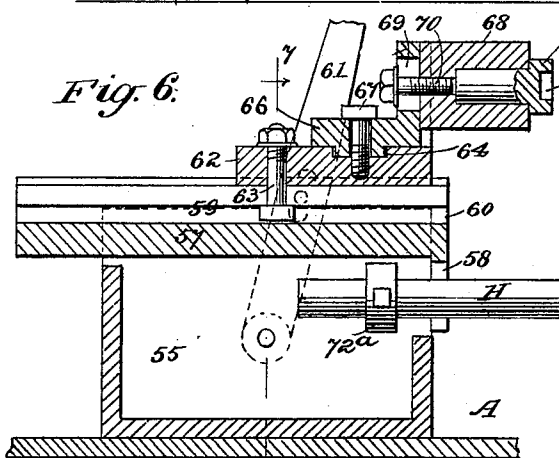
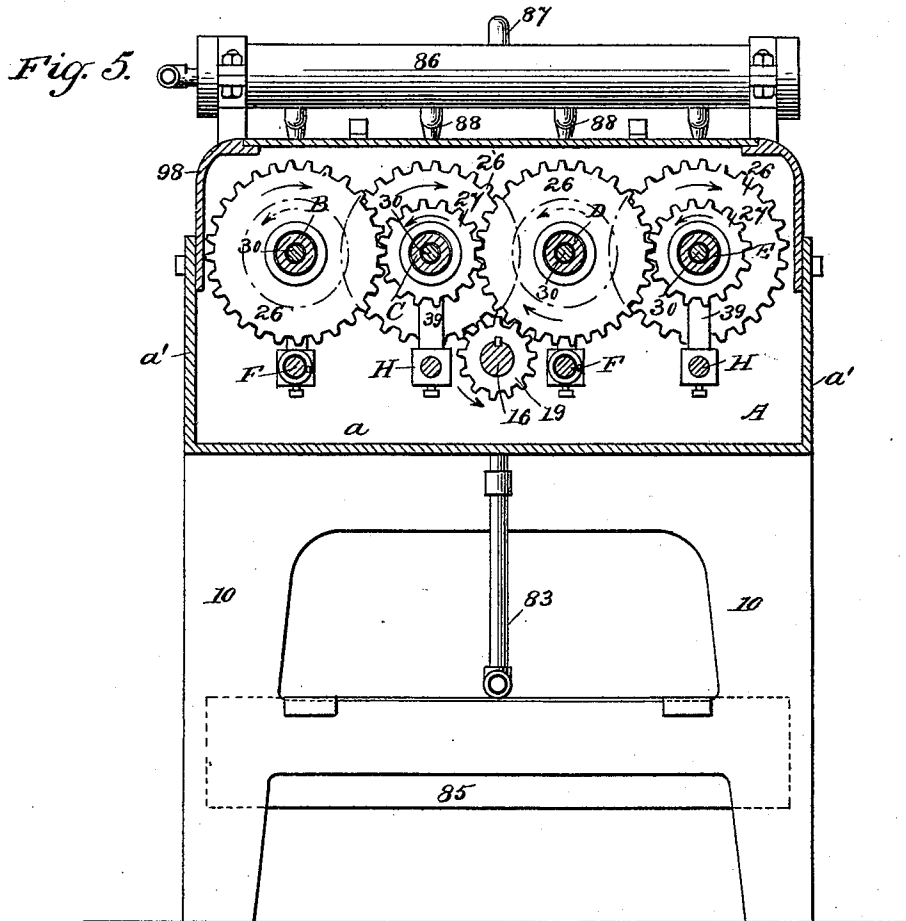
E Hubner
BY Munn & Co

ATTORNEYS

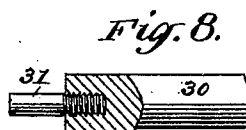
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No. 459,634.

Patented Sept. 15, 1891.



WITNESSES:
J. M. Criswell
C. Sedgwick



INVENTOR:
E. Hubner
BY *Munn & Co.*
ATTORNEYS

(No Model.)

7 Sheets—Sheet 6.

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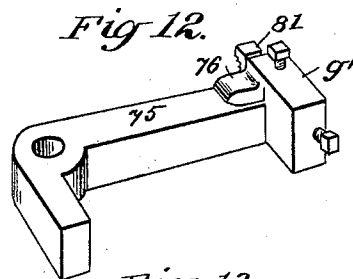
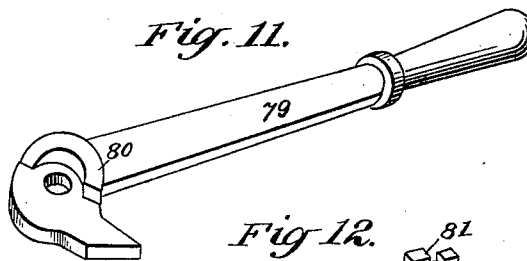
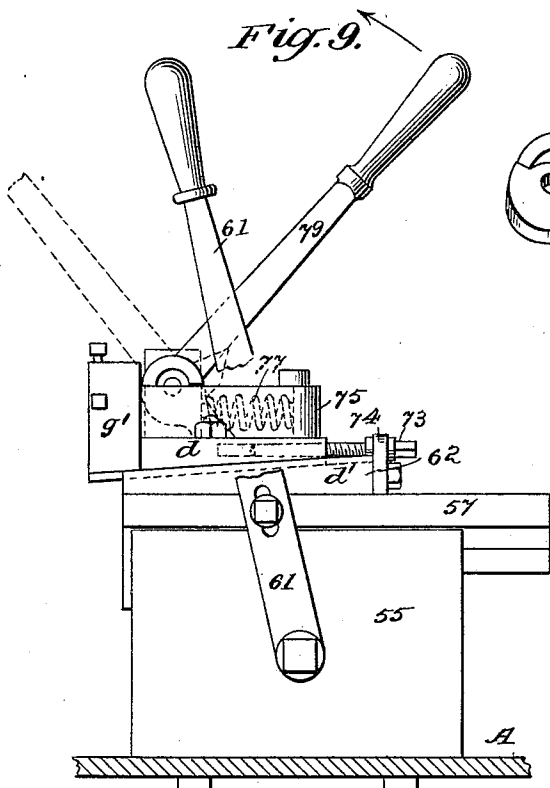


Fig. 13.

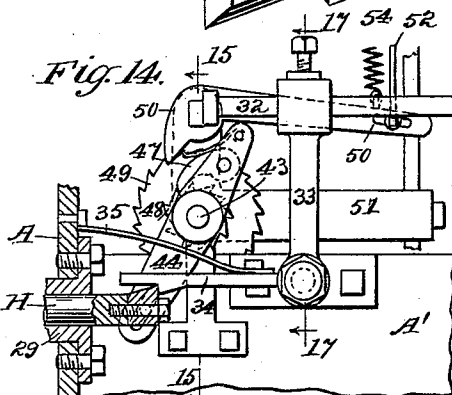
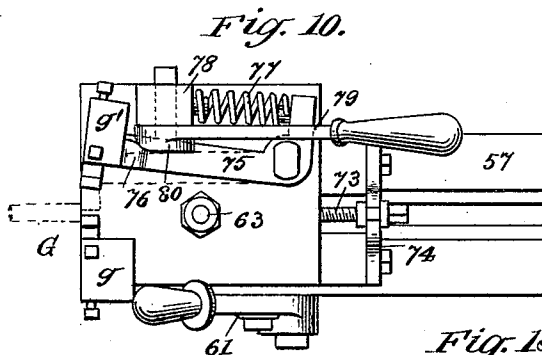
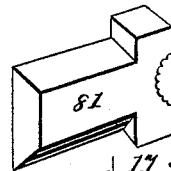


Fig. 15.

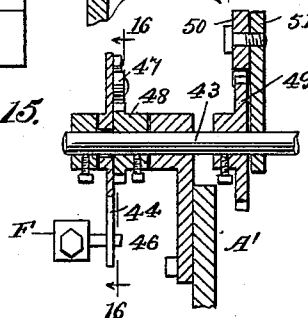
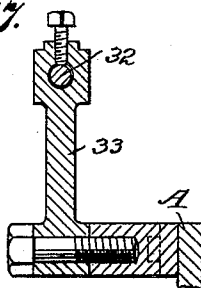


Fig. 17.



WITNESSES:
J. H. Griswell.
C. Sedgwick

INVENTOR: 46
E. Hubner
BY *Munn & Co*
ATTORNEYS

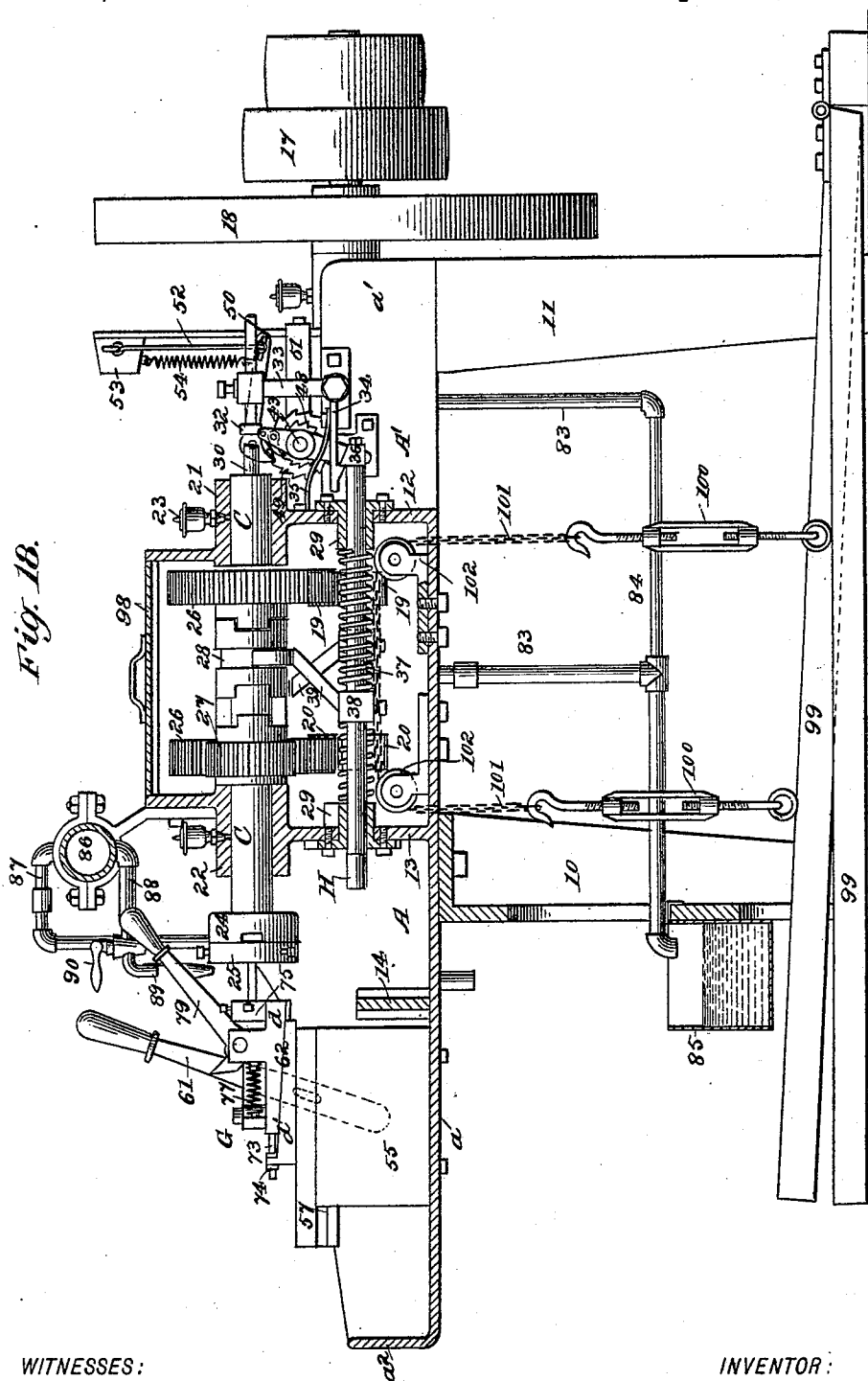
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J. H. Griswell.
C. Sedgwick

INVENTOR:

E. Hubner
BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

EMIL HUBNER, OF NEW YORK, N. Y.

MACHINE FOR THREADING BOLTS.

SPECIFICATION forming part of Letters Patent No. 459,634, dated September 15, 1891.

Application filed February 18, 1891. Serial No. 381,935. (No model.)

To all whom it may concern:

Be it known that I, EMIL HUBNER, of New York city, in the county and State of New York, have invented a new and Improved
5 Machine for Threading Bolts, of which the following is a full, clear, and exact description.

My invention relates to improvements in machines for cutting threads upon bolts and
10 other objects, especially the former, and has for its object to provide a simple and durable machine, so constructed that the oil dripping from its bearings or other points to which it is fed will be conducted to a receiving-vessel
15 and supplied in proper quantities therefrom to a feed-receptacle.

A further object of the invention is to provide a machine which, under the care of a single attendant, will produce complete threaded
20 bolts in quantities equal to those turned out by a number of machines as at present constructed, and also to provide a means whereby the bolts after being threaded will be expeditiously released and the machine be
25 brought into position to thread others.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

30 Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

35 Figure 1 is a side elevation of the machine. Fig. 2 is a plan view thereof. Fig. 3 is a longitudinal section taken practically on the line 3 3 of Fig. 2. Fig. 4 is a similar section taken on the line 4 4 of Fig. 2. Fig. 5 is a transverse section taken on the line 5 5 of Fig. 2.
40 Fig. 6 is an enlarged sectional view of the adjustable socket adapted to receive and to hold the bolt to be threaded, the said section being a longitudinal one and taken on the line 6 6 of Fig. 7. Fig. 7 is a transverse section through the mechanism illustrated in Fig. 6, the section being taken upon the line 7 7 of the said figure. Fig. 8 is a detail view of one end of a trip-rod, partially in section. Fig.
45 9 is a side elevation of a modified form of adjustable socket or chuck adapted to hold the bolt, and Fig. 10 is a plan view thereof. Fig. 11

is a detail perspective view of a cam-faced lever utilized for shifting the jaws of the chuck. Fig. 12 is a detail perspective view of the movable jaw acted upon by the lever, and Fig. 13 is a perspective view of one of the gripping-jaws detached from the adjustable main jaw. Fig. 14 is a side elevation of the trip and registering mechanism. Fig. 15 is a vertical section through the said mechanism, taken upon the line 15 of Fig. 14. Fig. 16 is a detail view of a lever, ratchet, and pawl, constituting a portion of the tripping mechanism; and Fig. 17 is a vertical section taken on the line 17
55 of Fig. 14. Fig. 18 is a longitudinal section through the machine, illustrating a modification in the construction thereof.

The bed A of the machine is preferably made of iron or other metal and is box-like,
60 comprising a continuous bottom a and upright sides a' and ends a^2 . The bed is essentially rectangular in general outline and at one end is provided with an extension A' , constituting an integral portion of the main body-frame;
65 but the extension is of much less width, as is illustrated in Fig. 2. The entire bed is preferably supported upon two leg-frames 10 and 11.

The main bed is usually provided with three transverse partitions 12, 13, and 14, the partitions 12 and 13 being of greater height than the partition 14, and a partition 15, preferably box-like or tubular in its character, is erected at or near the outer end of the bed-extension,
70 and is also of less height than the partitions 12 and 13. The driving-shaft 16 is journaled in suitable bearings upon the partition 15 and in the partitions 12 and 13. The said shaft extends centrally and longitudinally of the bed, as is best shown in Fig. 2. The outer
75 end of the drive-shaft has secured thereon a drive-pulley 17 and a fly-wheel 18, and between the partitions 12 and 13 two pinions 19 and 20 are keyed or otherwise attached.

In suitable bearings 21 and 22, formed, respectively, near the upper edges of the partitions 12 and 13, a series of tubular shafts are horizontally journaled, the said shafts being parallel and preferably of an even number—
80 as, for instance, four, which are designated 100 as B, C, D, and E. Each bearing 21 and 22 is usually fitted with an oil-cup 23.

Each tubular shaft at its forward or front end is provided with an enlargement or head

24, and to each head any approved form of chuck or die 25 is attached, adapted for cutting a thread. Each tubular shaft is further provided with two gears, which are loosely
 5 mounted—namely, a large gear-wheel 26 and a smaller wheel or pinion 27. In order to economize space and obtain differential speed, the gears are alternately arranged, the pinions upon one shaft being transversely opposite the spur-gears upon the next shaft, as is
 10 illustrated in Figs. 2 and 5. Between the gears of each tubular shaft a sleeve 28, having clutch-faces at each end, is splined or otherwise held to slide upon the shaft and
 15 turn therewith, and the faces of the gear-hubs opposed to the clutch-faces of the sleeves are constructed to receive such clutch-faces, as shown in Figs. 3 and 4. The large gears are the driving-gears while the thread is being
 20 cut, and are calculated to drive the tubular shafts at a predetermined rate of speed, and the small gears or pinions act as the driving-gears upon the reverse movement of the shafts, which movement removes the bolts
 25 from the chucks or dies. The pinions contain, preferably, about one-half the number of teeth that the gears do, whereby the threaded bolt is released much more expeditiously than the thread is cut, a decided advantage
 30 in machines of this type. The pinion upon one tubular shaft meshes with the spur-gear of the next shaft. The drive-shaft revolves to the left, and as the pinions on the drive-shaft mesh with the spur-gears of the tubular
 35 shafts the latter gears are turned to the right and the pinions of the tubular shafts revolve in the same direction as do those of the drive-shaft—namely, to the left—as indicated by the arrows in Fig. 5.

40 A shifting shaft is held to slide in bearings 29 beneath each tubular shaft, said bearings being located in the partitions 12 and 13. These shafts are operated upon to reverse automatically in substantially the same manner;
 45 but they are differently operated upon to impart to the tubular shafts a movement for cutting the thread, and as each alternate shaft is operated upon in the same manner I have distinguished them by the letters F and
 50 H. I will first describe the shifting mechanism of the first tubular shaft B (illustrated in the sectional view, Fig. 3) and the method of operating the same, together with the mechanism for feeding the bolt forward and registering the number of bolts threaded.

55 Within the tubular shaft a rod 30 is held to slide, the forward end of which has a pin 31, screwed therein or otherwise attached. The rear end of the rod extends beyond the shaft, and is adapted to strike against the
 60 head of a horizontal stud 32, adjustably secured in the upper end of a vertical lever 33, pivoted at its lower extremity upon one side of the bed-extension. Upon the pivoted end
 65 of the lever a horizontal forwardly-extending latch 34 is firmly attached, or the latch may be integral with the lever, and the head of

the latch, which is normally held downward by a spring 35, engages with a head 36 upon the rear end of the shifting shaft while the
 70 bolt is being threaded, as shown in Fig. 3. The shifting shaft is encircled by a coil or spiral spring 37, having a bearing against the rear journal-box and a collar 38, fixed upon the shaft. When the head of the latch and
 75 shaft engage, the spring is compressed, and when the head of the shaft is released the spring throws the shaft forward. The shifting shaft and the clutch 28 of the tubular shaft B are preferably rigidly connected by
 80 a bar 39, secured to the collar 38. The forward end of the shifting shaft is connected by a link 40 with a fixing-lever 41, pivoted upon a partition 42 forward of the partition 14. The link 40 passes through an opening
 85 in the partition 14, and the fixing-lever, when pushed forward, forces the shifting shaft to an engagement with the latch 34. At the rear of the partition 12 of the main bed a registering-shaft 43 is journaled in suitable
 90 bearings located upon the extension-bed A', as is best shown in Fig. 3, and the shaft is of sufficient length to project some distance beyond the sides of said extension. At one extremity of the shifting shaft a link lever 44 is
 95 fulcrumed near its center, as shown in detail, Fig. 14, and the lower end of the lever is provided with a slot 45, receiving a pin 46, which connects the lever with the head of the shifting shaft. The upper end of the lever is
 100 provided with a spring-pressed dog 47, and the said dog engages with the teeth of a ratchet-wheel 48, fast upon the registering-shaft. When a bolt has been threaded and the shifting shaft is placed in position to
 105 cause the threading of another bolt, the dog revolves the ratchet-wheel one tooth, thereby also revolving the registering-shaft and a large ratchet-wheel 49, secured upon the registering-shaft, one tooth, the said large ratchet-wheel being located at any convenient
 110 point in the length of the shaft. The large ratchet-wheel 49 is engaged by the curved head of a registering-lever 50, pivoted at its head upon the upright member of an angled post 51, secured to the extension-bed.
 115 The long end of the lever is connected by a link 52 with the trip-arm of any suitable registering device 53, and the head of the registering-lever is held in engagement at all times
 120 with the ratchet-wheel 49 by a spring 54 or its equivalent attached to the registering device and to the rear end of the lever, as shown in Fig. 3. Thus when the ratchet-wheel 49 is moved a tooth it moves the head of the registering-lever, thereby depressing its opposite
 125 end and causing the registry of a finished bolt. Around the fixing-lever a hollow base-block 55 is erected upon the bed A, having inwardly-extending flanges at its inner edges forming
 130 slideways 56. A table 57 is located upon the block and is adapted to slide longitudinally thereon, being to that end provided with grooves in its side to receive the slide-

ways 56, as shown in Fig. 7. The table has integral with its rear end a downwardly-extending lug or arm 58, and longitudinally in its upper face an essentially T-shaped slot 59 is produced, the lower portion of the slot being undercut, as shown at 60 in said Fig. 7. The movement of the table is accomplished through the medium of a lever 61, which is pivoted at one side of the base-block and attached to one side of the table. A bed-block 62 is placed upon the table, provided with a rib upon its under face fitting into the upper member of the table-slot 59, and the bed-block may be secured wherever desired in the length of the table by means of a bolt 63, the head whereof is located in the undercut portion of the table-slot, and the threaded end of the bolt passes upward through the bed-block near its forward end, being provided with a suitable nut, as illustrated in Figs. 6 and 7. The bed-block has a transverse groove 64 cut in its upper face adapted to receive a rib formed upon the horizontal member of an angled or L-shaped tail-block 66. The tail-block is also provided with a transverse slot extending through the rib, and a set-screw 67, which is passed through the slot into the bed-block. By these means the tail-block may be fixed in any transverse position upon the bed-block, as shown in Fig. 6. A socket 68 is attached to the vertical member of the tail-block, and is vertically adjusted thereon by producing a slot 69 in the said member and passing a set-screw 70 through the slot into the socket. The socket is formed, preferably, with a circular bore, in which the shank of a clamp or retaining-head 71 is fitted and held from turning by a set-screw of any description. The retaining-head has a cavity or recess 72 formed therein of polygonal shape, the contour of the recess corresponding to that of the bolt-head it is to receive. When the head of an unthreaded bolt is placed in the retaining-head 71, the end of the shank to be threaded when the socket 68 is properly adjusted will be in position to enter between the dies of the chuck or die, as shown in Fig. 3. The table, base-block, tail-block, and socket collectively may be called a guide or head stock, and by reason of the adjustment of each section or member thereof the retaining-head may be expeditiously and conveniently made to center the chuck or die. In the operation of this portion of the machine, when the thread has been cut upon the bolt the desired length the bolt presses against the pin 31 of the sliding bar 30 in the tubular shaft B, and at the rearward movement of the rod it strikes the post 32, thereby canting the lever 33 sufficiently to relieve the latch 34 from connection with the shifting shaft F, and the moment the shaft is released it is forced outward by the action of the spring 37, causing the clutch 28 to disengage from the large gear 26 and engage with the pinion 27. The movement of the tubular shaft B is thus instantly reversed and the speed increased, which causes the die

to rapidly leave the threaded portion of the bolt. By moving the lever 61 forward a slight distance the entire head or guide-stock with which it is connected is moved in the same direction and the finished bolt may be removed and another inserted. The lever is then carried farther forward until the lug or arm 58 of the head or guide stock table strikes the fixing lever 41, carrying it forward, whereupon the shifting shaft is pushed rearward and its head engaged with the latch 34. This movement of the shaft throws the clutch in engagement with the gear 26, and the movement of the tubular shaft is again reversed and its speed decreased. The rearward movement of the shifting shaft also causes the registering-shaft to revolve, as heretofore stated, and the finished bolt is duly registered. A guide or head stock of the construction described is provided for each tubular shaft, and likewise a latch-lever and post, link-lever, and ratchet-wheel for recording purposes. The movement of the shifting shaft H of the second tubular shaft C is just the reverse of that of the shaft F. Consequently the position of the bar 39, connecting it with the chuck also occupies a reverse position to the bar connecting the shaft F with its chuck, as is best shown in Fig. 4. The tendency of the spring 37 is to throw the shaft H rearward, and instead of the latch 34 engaging with the upper surface of the shaft-head it contacts with its rear face, and the link 40 and the fixing lever 41 are dispensed with, the shaft being continued through the partition 14 and also the lug 58 of the guide-stock table, as shown in Fig. 6, and beneath the table it has secured thereon a collar 72^a. The shifting shaft having been fixed to throw the clutch 28 in mesh with the large gear of the shaft C when the bolt is threaded, the pin 31 of the sliding rod 30 is struck thereby, and the rod, in the manner heretofore described, releases the shifting shaft from the latch 34, and the shaft, being thrown rearward by its spring, moves its link lever in such a manner as to cause it to turn the registering-shaft through the medium of its dog and adjacent ratchet-wheel engaged thereby. It will be noticed that the shaft H records as soon as the bolt is threaded and the shaft F some time afterward. The shaft H is set for the cutting operation by drawing it forward until the latch strikes its head, which is accomplished by the lug 58 of the table 62 drawing upon the collar 72^a of the shaft. The difference in the operation of the two shafts F and H is made necessary by reason of the difference in the position of the gears upon the driven tubular shafts.

In Figs. 9 and 10 I have illustrated a modified form of guide or head stock, the same being adapted for use when bolts with round heads are to be threaded. The base-block 55 is the same in construction as that of the guide-stock heretofore described and likewise the table 57. The bed-block 62, however, is

made in two sections d and d' , one section being adapted to slide upon the other, and the opposing faces of the sections are beveled, whereby the movable section travels upon an inclined plane. The adjustment of the upper section d , which is the movable one, is preferably accomplished through the medium of a screw 73 entering the rear end of the section and held to slide in a rib 74, formed upon the undersection. Both sections of the base-block may be moved longitudinally upon the table and secured in any desired position in the length of said movement by a screw 63, connecting the table and bed-block in the same manner as heretofore described. The lever 61 is also the same, being pivoted to the base-block and connected with the table. The chuck or retaining device G, adapted to clamp the head, is made in two sections g and g' . The section g is capable of longitudinal adjustment upon the bed-block, and the section g' is attached to an angled arm 75, which is fulcrumed at the junction of its members upon the bed-block, as is best shown in Fig. 10. The said angled arm is provided with a cam-faced lug 76 upon its upper face near the chuck-section g' , and a spring 77 bears against the inner or transverse member of the arm and against the box 78, formed upon the base-block, as is likewise best shown in Fig. 10, the tendency of the said spring being to force the chuck-section g' away from the opposing section g . The chuck-section g' is forced in the direction of the fixed section g when the bolt-head is to be clamped through the medium of a lever 79, fulcrumed upon the box 78. This lever is provided with a cam-rib 80, engaging with the cam-lug 76 of the arm. By the manipulation of the lever 79 the arm 75 is thrown inward and locked in a clamping position. Each chuck-section g and g' is provided with a clamping-jaw 81. (Illustrated in detail in Fig. 13.) These clamping-jaws are removable in order that suitable sizes of jaws may be placed in the chuck-sections to clamp any form of head.

In the operation of the entire machine the attention of but one man is needed. Starting at the shaft B, for instance, the bolt is placed in position to be threaded, and when the bolt has been caught by the dies a bolt is placed so as to be operated upon by the shaft C, and when this bolt is caught in the dies of this shaft the attendant passes to the next shaft D, and then to the shaft E, or vice versa. It will thus be observed that by the time a bolt has been placed to be threaded in the dies of the shaft E the bolt entered upon the shaft B is threaded and completed and ready to be removed. Thus in one machine the work of four may be accomplished. The bolts finished upon all of the shafts are duly recorded one after the other.

One of the prime features of the invention is to provide a means whereby the waste of oil will be obviated, and this is accomplished, mainly, through the box-like structure of the

bed and its extension, which bed receives all the oil dripping from any of the moving portions of the machine. The oil is conducted from the various compartments of the bed through the medium of downwardly-extending pipes 83, which connect with one or more horizontal pipes 84, the latter pipe or pipes being carried forward preferably over a tank 85, bolted or otherwise secured to the forward legs 10. The oil is fed to the various moving portions of the machine through the medium of suitable oil-cups, and to the bolts while being threaded, from a tank 86, located above the tubular shafts, the said tank being preferably supported by standards secured to the upper portion of the partition 13, as shown in Fig. 3. The tank 86 is provided with an overflow 87, which leads down into the tank 85, and with a series of tubes 88, extending horizontally from the under side, which tubes are curved downward, so as to be located over the bolts while they are being threaded, and upon the curved lower ends of the tubes 88 flexible tips 89 are attached, whereby the oil may be guided over the threaded surface of a bolt or over the surface to be threaded, as may be deemed advisable. The supply of oil from the tank 86 may be cut off whenever desired through the medium of stop-cocks 90, one of which is located at any desired point in the length of each of the supply-tubes 88. The oil collected in the tank 85 is fed to the upper tank 86 through the medium of a pump 91 of any suitable or approved form, the same being best illustrated in Fig. 1, and the pump is operated preferably through the medium of a belt passing over a drive-pulley 92, connected with the pump, and over a suitable pulley upon any adjacent counter-shaft.

In order to preserve any oil that may drip from the bearings of the pump, tubes 93 are located beneath said bearings, having funnel-shaped upper ends 94, as is also illustrated in Fig. 1, which tubes 93 connect with the tank 85 through the medium of horizontal pipes 95. The suction-pipe 96 of the pump also passes into the tank 85, and the supply-pipe 97 into the upper tank 86.

In each side of the machine, in horizontal alignment with the thread-cutting devices, one or more fenders 97^a are located, adapted to direct the oil thrown in the direction of the sides of the machine by the rotation of the tubular shafts down into the bed, and the gearing is covered by a casing 98 to prevent the same from becoming clogged with dust.

Instead of hand-levers, foot-levers 99 may be utilized to operate the shifting shafts, in which event the foot-levers are connected by turn-buckles 100 and chains 101 to the collars 38 of the shifting shafts, as shown in Fig. 18, the chains being passed over suitable rollers 102.

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

1. In a machine of the character described,

the combination, with a drive-shaft having fixed gears, a tubular driven shaft provided with a screw-cutting die, and a sliding trip-rod located in the tubular shaft, of gears held to slide upon the tubular shaft, a shifting shaft located beneath said tubular shaft, a latch-lever engaged by the trip-rod and engaging with the shifting shaft, and a clutch mechanism carried by the tubular shaft and connected with the shifting shaft, substantially as described.

2. In a machine of the character described, the combination, with a drive-shaft, a tubular driven shaft provided with loosely-mounted gears, a screw-cutting die, and a clutch located between the gears, of a spring-pressed shifting shaft connected with the clutch, a trip-rod adapted to be engaged by a finished bolt and loosely placed in the tubular shaft, a trip-lever provided with an adjustable head located near one end of the trip-rod, and a spring-pressed latch connected with the lever and engaging the shifting shaft, as and for the purpose set forth.

3. In a machine of the character described, the combination, with a drive-shaft, a driven shaft provided with loosely-mounted sliding gears, a screw-cutting die, and a clutch between the gears, of a spring-controlled shifting shaft connected with the clutch, a recording mechanism, a recording-shaft, a trip mechanism connecting the recording-shaft and the recording mechanism, and a link connection between the shifting shaft and the recording-shaft, substantially as described.

4. In a machine of the character described, the combination, with a drive-shaft, a tubular driven shaft provided with sliding gears, a clutch between the gears, and a screw-cutting die, and a trip-rod adapted to be acted upon by the finished bolt, said rod being located within the tubular shaft, of a spring-controlled shifting shaft connected with the clutch, a trip-lever located near one end of the trip-rod, a latch attached to the lever and engaging with the shifting shaft, a recording-shaft, a recording mechanism operated from said shaft, and a link connection between the shifting and the record shafts, as and for the purpose specified.

5. In a machine of the character described, the combination, with a drive-shaft, a tubular driven shaft provided with sliding gears and a screw-cutting die, a shifting shaft, and a clutch located between the gears of the tubular shaft and connected with the shifting shaft, of a trip-rod held to slide in the tubular shaft, a trip-lever near one end of the trip-rod, a latch connected with the lever and engaging with the shifting shaft, and a movable head-stock adapted to carry the bolt, and also adapted for engagement with the shifting shaft to set the same, as and for the purpose specified.

6. In a machine of the character described, the combination, with a drive-shaft, a tubular driven shaft provided with sliding gears and

a screw-cutting die, a shifting shaft, and a clutch located between the gears of the tubular shaft and connected with the shifting shaft, of a trip-rod held to slide in the tubular shaft, a trip-lever near one end of the trip-rod, a latch connected with the lever and engaging with the shifting shaft, a movable head-stock comprising a series of adjustable sections, a bolt-socket or chuck adjustably attached to the head-stock, and an arm projected from the head-stock and engaging at one point in its travel with the shifting shaft and moving the same, substantially as described.

7. In a machine of the character described, the combination, with a drive-shaft, gears fixed thereon, a tubular shaft provided with sliding gears of different diameters and a screw-cutting die, a spring-controlled shifting shaft below the tubular shaft, a clutch mechanism located upon the tubular shaft between its gears and connected with the shifting shaft, and a trip-rod held to slide in the tubular shaft, of a trip-lever provided with an adjustable head located near one extremity of the trip-rod, a latch carried by the lever and adapted for engagement with the shifting shaft, a recording mechanism, a recording-shaft adjacent to the recording mechanism, a link connecting the shifting shaft and recording-shaft, provided with a spring-pressed dog, a ratchet-wheel mounted upon the recording-shaft and engaged by the dog, a second and larger ratchet-wheel secured upon the recording-shaft, and a lever engaging with the larger ratchet-wheel and connected with the trip device of the recording mechanism, as and for the purpose specified.

8. In a machine of the character described, the combination, with a drive-shaft having fixed gears, a tubular driven shaft provided with a screw-cutting die and sliding gears of different diameters, a spring-controlled shifting shaft, a clutch held to slide upon the tubular shaft and connected with the shifting shaft, a recording mechanism, a recording-shaft journaled at a right angle to the shifting shaft, and a link connecting the recording shaft and shifting shaft and provided with a spring-controlled dog, of a trip-rod held to slide in the tubular shaft, a lever the upper end of which is opposite one end of the trip-rod, a latch attached to the lever and engaging with the shifting shaft, a movable head-stock, an adjustable chuck or bolt-clamp carried by the head-stock, an arm attached to the head-stock and engaging with the shifting shaft, and a trip mechanism operated upon by the recording-shaft and connected with the recording mechanism, as and for the purpose specified.

9. In a machine of the character described, the combination, with a drive-shaft having fixed gears, a series of independent essentially parallel tubular shafts, each tubular shaft being provided with loosely-mounted sliding gears, the gears of the several shafts

meshing with each other and certain of the gears with the fixed gears of the drive-shaft, a screw-cutting die located upon one end of each tubular shaft, and a clutch located upon
5 each of the tubular shafts between its gears, of a spring-controlled shifting shaft located beneath each tubular shaft and connected with the clutch of the tubular shaft above it, a recording mechanism, a recording-shaft,
10 link connections between the shifting shafts and the recording-shaft, and a trip mechanism connected with the recording mechanism and the recording-shaft, as and for the purpose specified.

15 10. In a machine of the character described, the combination, with a drive-shaft provided with fixed gears of equal size, of a driven shaft provided with a screw-cutting die, sliding gears of different diameters adapted to
20 mesh alternately with the fixed gears of the drive-shaft, a spring-controlled shifting shaft, a clutch located upon the driven shaft between its gears and connected with the shifting shaft, a latch-lever engaging with the shifting
25 shaft, and a trip-rod located in the driven shaft and adapted to engage with the latch-lever, substantially as shown and described, whereby the driven shaft will be given a slow

movement when the bolt is being threaded and a quick movement after the bolt is threaded, as set forth. 30

11. In a machine of the character described, the combination, with a box-like base or body adapted to carry the operative mechanism of the machine, a trough supported upon the
35 supports of the base, and a tank located above the mechanism carried by the base, of a pump connected with the trough and tank and tubes leading from the base into the trough, substantially as and for the purpose specified. 40

12. In a machine of the character described, the combination, with a box-like base or frame, a tank or trough located beneath the frame, and a second tank located above the frame, of a pump having connection with both tanks, 45 tubes connecting the base with the lower tank, tubes projected from the upper tank downward and provided with flexible tips, and an overflow-pipe leading from the upper tank into the box-like frame, as and for the 50 purpose specified.

EMIL HUBNER.

Witnesses:

J. F. ACKER,
C. SEDGWICK.