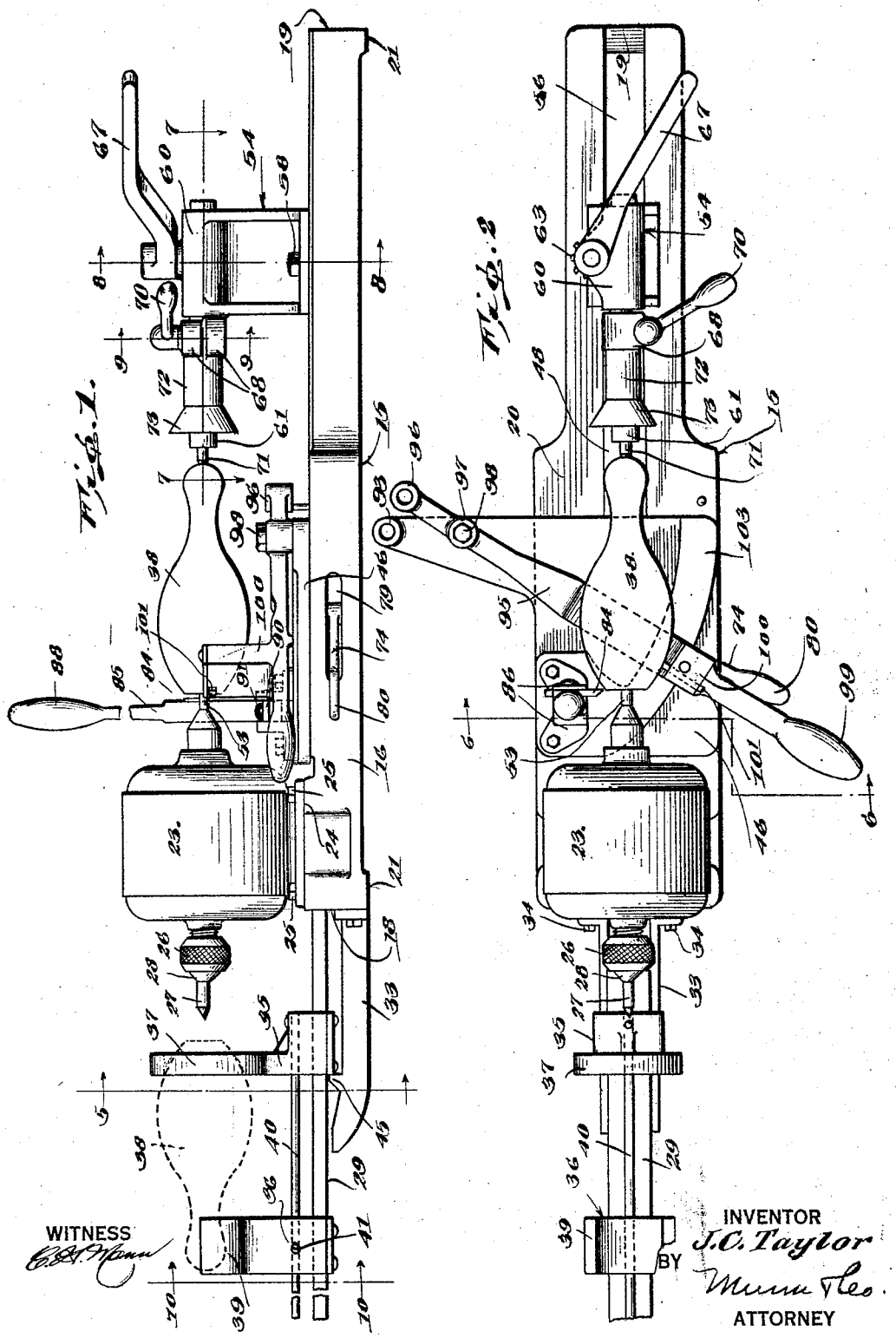
Dec. 6, 1932. J. C. TAYLOR 1,890,422

BOWLING PIN REJUVENATOR

Filed Feb. 11, 1931 5 Sheets-Sheet 1



WITNESS

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BOWLING PIN REJUVENATOR

Filed Feb. 11, 1931 5 Sheets-Sheet 2

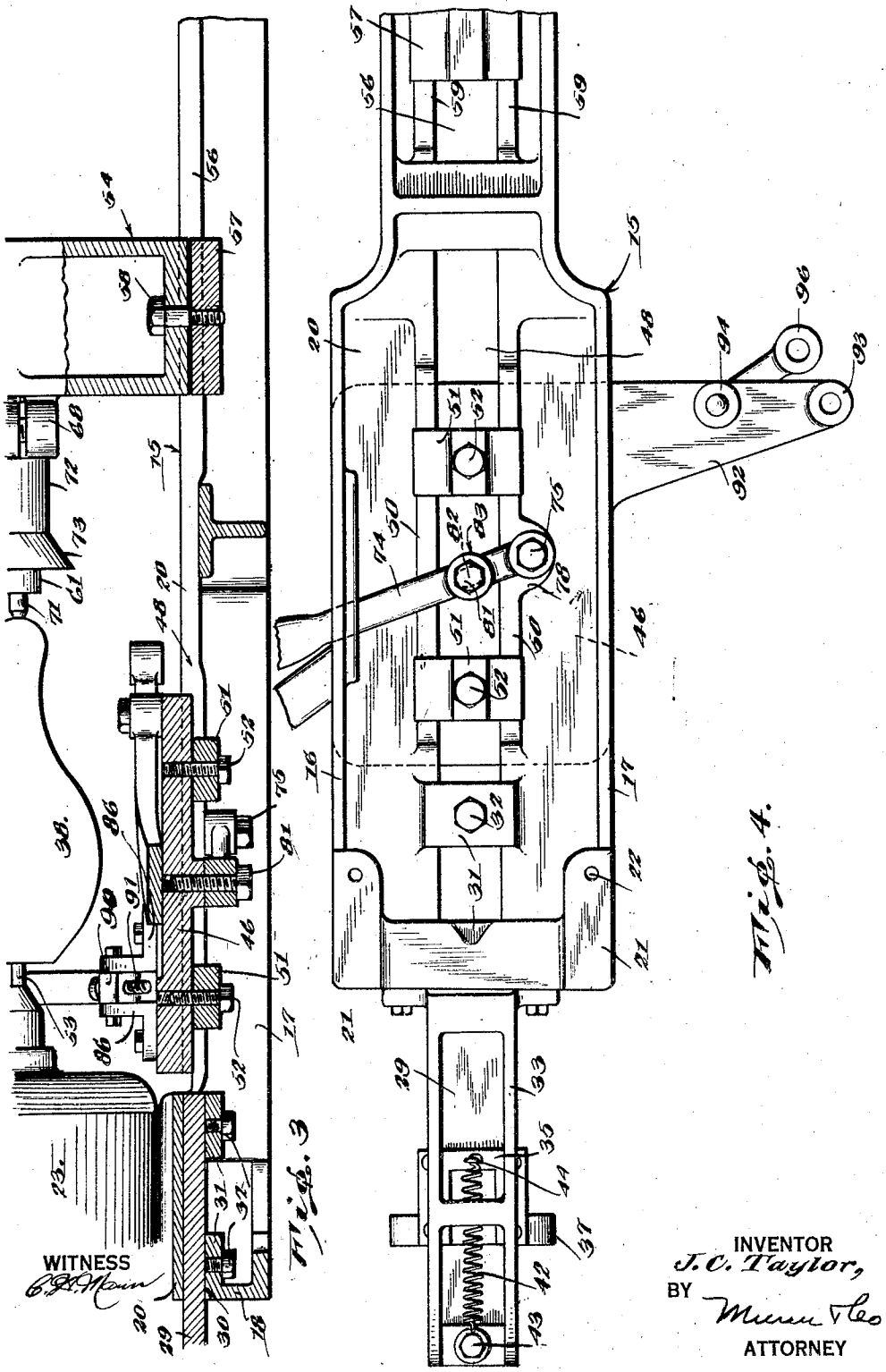


Fig. 3.

Fig. 4.

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BOWLING PIN REJUVENATOR

Filed Feb. 11, 1931 5 Sheets-Sheet 3

Fig. 5.

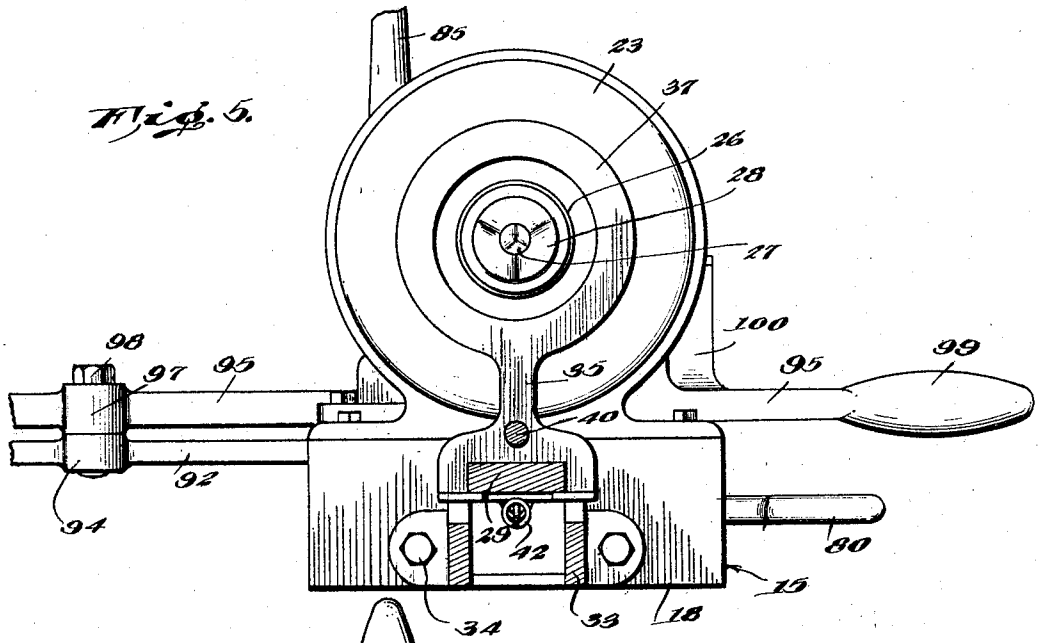
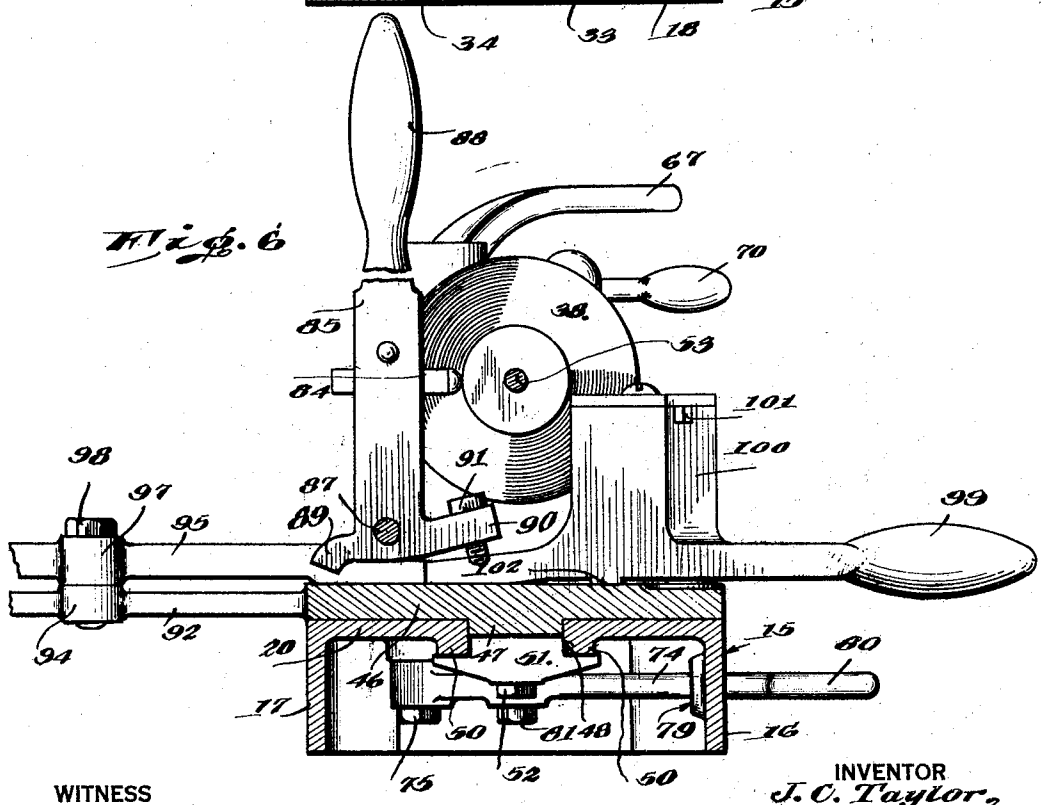


Fig. 6.



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BOWLING PIN REJUVENATOR

Filed Feb. 11, 1931 5 Sheets-Sheet 4

Fig. 7

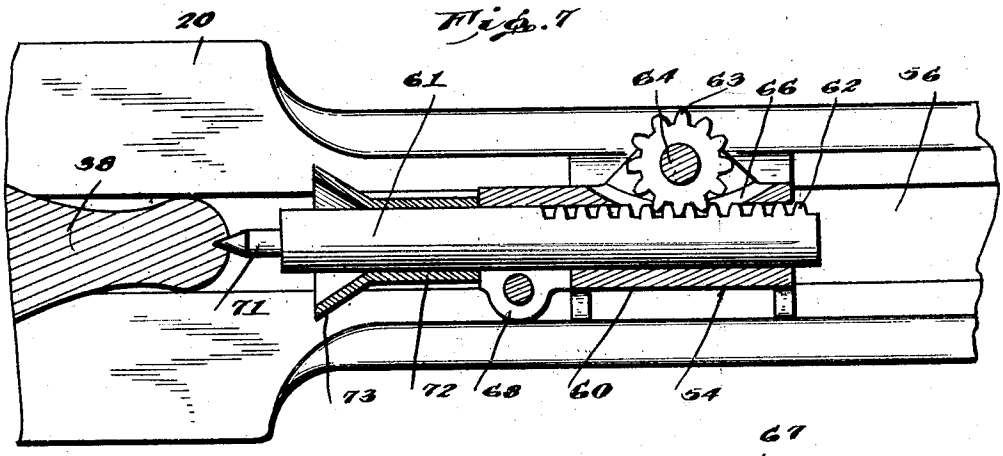


Fig. 8

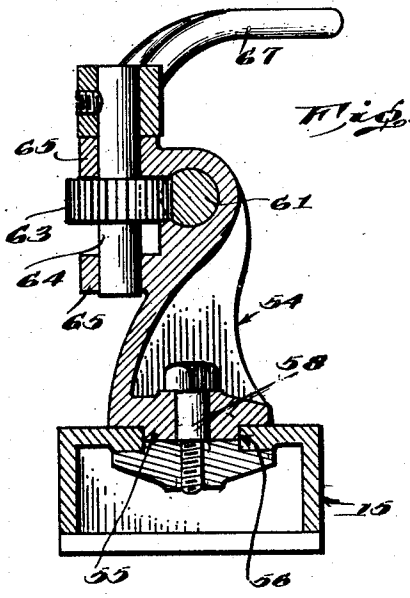


Fig. 9

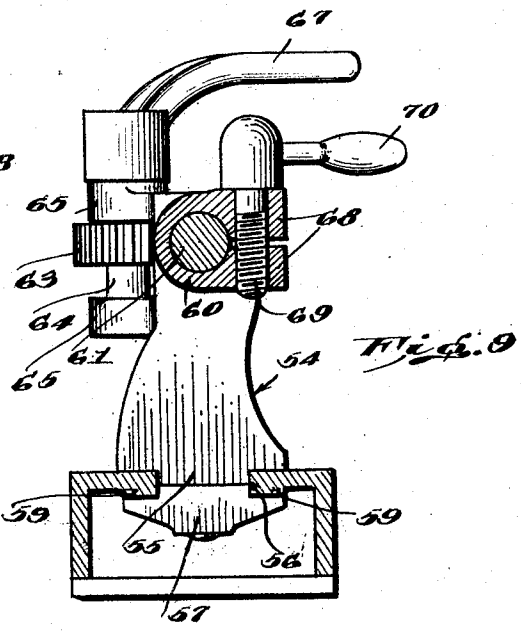
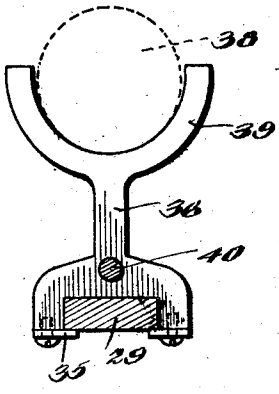


Fig. 10.



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BOWLING PIN REJUVENATOR

Filed Feb. 11, 1931 5 Sheets-Sheet 5

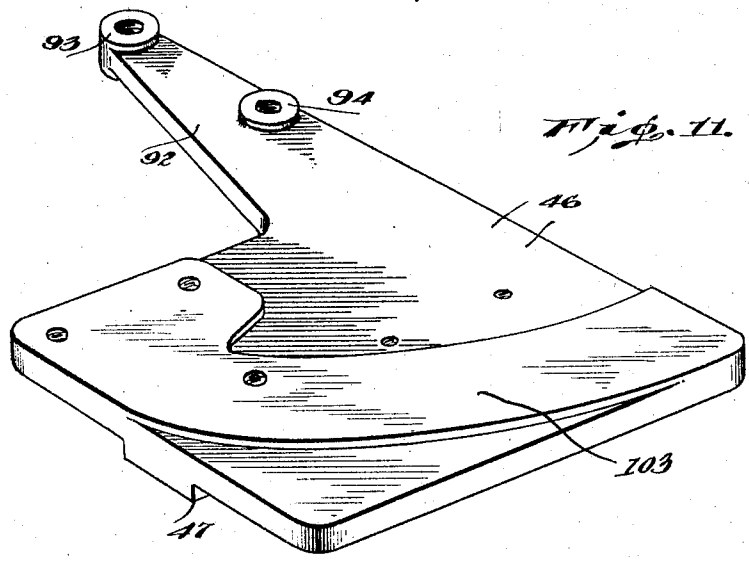


Fig. 11.

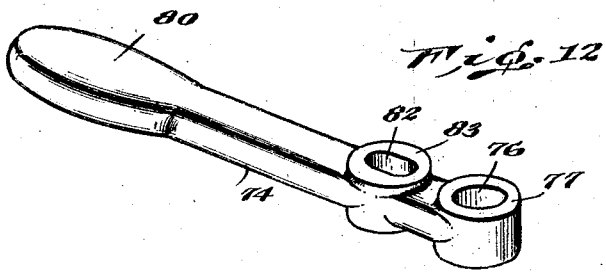


Fig. 12.

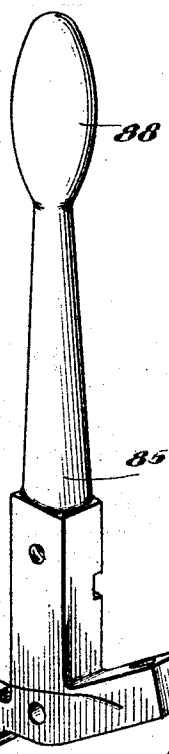


Fig. 13.

Fig. 14.

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UNITED STATES PATENT OFFICE

JOHN COOPER TAYLOR, OF HERMANSVILLE, MICHIGAN

BOWLING PIN REJUVENATOR

Application filed February 11, 1931. Serial No. 515,064.

My invention relates to machines for rejuvenating worn bowling pins and restoring them to regulation size and proportions.

When bowling pins leave the factory there is a 3/8" bore centrally of the bottom of the pins which is countersunk to a diameter of 1¼". The outside diameter of the pins at the bottom is approximately one inch greater than the diameter of the central countersink so that a circular flat bearing rim is formed and upon which the pin rests when standing. During continued use of the pins this bearing rim becomes worn and untrue and it is a primary purpose of this invention to restore the bottom and the lower portion of the sides of the pin to their true proportions.

Another object of the invention is to provide in a simple and compact apparatus with means for restoring the bore and countersink in the bottom of the pin to the correct size and with means for trimming the bottom and lower portion of the sides of the pin to restore the pin to the correct proportions.

A further object of the invention is to provide an apparatus which may be readily adapted to operate upon either duckpins or tenpins.

A still further object of the invention is to provide an apparatus in which the pins will be automatically alined for each operation and one which may be satisfactorily operated by a relatively unskilled operator.

A still further object is to provide an apparatus which is simple and inexpensive in construction, one in which the parts may be readily disassembled for repair or replacement, and one in which the parts are not likely to become easily broken or out of order.

Other important objects and advantages of the invention will become apparent during the course of the following detailed description when read in conjunction with the accompanying drawings, which form a part of this specification and in which:

Figure 1 is a side elevation of the invention;

Fig. 2 is a top plan view thereof;

Fig. 3 is a fragmentary view, partially in side elevation and partially in section;

Fig. 4 is a bottom plan view;

Fig. 5 is a vertical sectional view taken on the line 5—5 of Fig. 1;

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 2;

Fig. 7 is an enlarged detail view taken on the line 7—7 of Fig. 1;

Fig. 8 is a vertical sectional view taken on the line 8—8 of Fig. 1;

Fig. 9 is a sectional view taken on the line 9—9 of Fig. 1;

Fig. 10 is a sectional view taken on the line 10—10 of Fig. 1;

Fig. 11 is a perspective view of a sliding carriage employed in the invention;

Fig. 12 is a perspective view of an operating handle for said carriage;

Fig. 13 is a perspective view of the end cutter holder; and

Fig. 14 is a perspective view of the side cutter holder.

Referring now to the drawings in detail, in which like numerals refer to like parts throughout the several views, 15 indicates a base upon which the operating parts are mounted. The base 15 may be formed in the shape of an inverted channel member so as to form side walls 16 and 17 and end walls 18 and 19 with a flat top 20 joining these walls and extending therebetween. The bottom of the base is machined off at either end to provide bearing points 21 which rest upon a suitable support or work bench. Bolt holes 22 are provided in the bearing portions 21 for the reception of anchoring bolts (not shown).

A suitable electric motor 23 is mounted upon one end of the base 15 as at 24, the base being machined at this point to provide a suitable seat for the motor which is anchored to the base by means of bolts 25. The motor is mounted so that its rotor shaft is disposed parallel with the longitudinal center line of the base 15 and is in vertical alinement therewith. The left hand end of the motor shaft extends beyond the end 18 of the base and is provided with a chuck 26 which supports a boring drill 27 and a countersinking reamer 28 as clearly shown in Figs. 1, 2 and 5.

An extension bar 29 projects longitudinally from the left end of the base 15. The

inner end of this bar passes through a horizontal slot 30 in the end wall 18 and fits in a socket between the top wall 20 and two lugs 31 which are cast with the base 15. The extension is securely locked in position by securing bolts 32 which are threaded through the lugs 31.

A brace 33 extends from the end wall 18 just below the point of entrance of the extension 29, being secured to said end wall by bolts 34. The brace 33 is in longitudinal alinement with the extension bar 29 and serves to prevent sagging of the unsupported end of the bar as well as to prevent lateral displacement thereof.

A pair of bowling pin supporting members 35 and 36 are slidably disposed on the extension bar 29. The member 35 includes an upstanding ring 37, the bore of which is centered with respect to the drill 27 and is shaped to snugly receive the tapered lower end of a bowling pin 38. The member 36 is formed with a U-shaped cradle 39 which is adapted to support the head of the pin 38. A circular rod 40, securely fastened within a bore in the member 35 extends from the same through a bore in the member 36. A set screw 41 in the member 36 may be tightened to lock this member to the rod 40, thereby permitting locking of the members 35 and 36 in spaced relation.

A coil spring 42 having one end secured to the under face of the end of the brace 33 as at 43 and the other end secured to the under face of the member 35 as at 44, serves to normally urge the member 35 away from the motor 23. Upstanding lugs 45 formed on either side of the brace 33 serve as stops to limit the outward travel of the member 35,

The upper surface 20 of the base 15 is machined down so as to present a smooth plane surface. Mounted upon the base just forwardly of the motor 23 is a sliding carriage or table 46. The under face of the table 46 is provided with a longitudinally extending rib or projection 47 which projects into and has a snug sliding fit within a central longitudinally extending slot 48 formed in the top 20. The walls of the slot 48 are machined and the under face of the top 20 is provided with machined ribs 50 bordering the edges of the slot 48, the ribs 50 forming bearings for transversely extending gibs 51 which are secured to the under face of the rib 47 by headed bolts 52. The gibs 51 serve to slidably lock the table 46 to the base 15.

The right hand end of the rotor shaft of the motor 23 extends partially over the table 46 and terminates in spindle 53 adapted to fit within the bore in the bottom of the bowling pin 38 and to form the head stock of a lathe, the tail stock 54 of which is slidably mounted upon the opposite end of the base 15.

The tail stock 54 has a depending tongue on rib 55 which extends into a longitudinal slot 56 formed in the top 20 of the base. The stock is held from displacement by a gib 57 which is secured to the under face of the rib 55 by means of a screw bolt 58. The wings of the gib 57 bear against machined ribs 59 formed with the top 20 and bordering the slot 56. Tightening of the bolt 58 results in locking the stock 54 any desired distance from the head stock.

The upper end of the stock 54 terminates in a sleeve 60 which is centrally alined with the spindle 53 carried by the motor shaft. A tail spindle 61 is carried within the bore of the sleeve 60 and is mounted for projection and retraction toward and from the motor. For the purpose of accomplishing this longitudinal movement, the spindle 61 is formed on one side with a plurality of gear teeth 62 forming a rack which is engaged by a pinion 63 carried on a vertical shaft 64 which in turn is journalled in bearings 65 formed with the stock 54. The pinion extends through an opening 66 in the side of the sleeve 60.

The pinion 63 is keyed or otherwise secured for rotation with the shaft 64 which shaft extends above the upper bearing 65 and is provided with an operating handle 67. It will be evident that movement of the handle 67 will result in rotation of the pinion 63 and a consequent longitudinal movement of the spindle 61. For the purpose of locking the spindle 61 in position after adjustment, one end of the sleeve 60 is split and provided with ears 68 which are adapted to be drawn together by a clamping screw 69 operated by a hand lever 70. Movement of the handle 70 in a clockwise direction results in clamping together of the ears 68 and a tightening of the split end of the sleeve upon the spindle.

It will be noted that the spindle 61 normally projects a considerable distance beyond the end of the sleeve 60 toward the motor 23 and that this projecting end is provided with a pointed center 71 which engages the end of the work, which in this case is the head of a bowling pin. When the pins come from the factory there is no center mark in the head of the pin, therefore in order to correctly center the head of the pin, I have provided a centering sleeve 72 which is slidably disposed on the projecting end of the spindle 61. The sleeve 72 is provided with a flared conical end 73.

When it is desired to mount a pin 38 between the head and tail stocks, the bottom of the pin is inserted on the spindle 53, said spindle occupying the center bore in the bottom of the pin. With the lower end of the pin thus supported, the head is brought into approximate alinement with the spindle center 71, the spindle being in retracted position. The sleeve 72 is then slid forwardly to engage the cone 73 with the head of the pin, thereby

centering said head with respect to the center 71.

The lever 67 is then turned in a clockwise direction to project the spindle 61 toward the pin head and engage the center 71 in the end thereof, this operation also forcing the bottom of the pin fast upon the spindle 53. A pull on the lever 70 clamps the spindle and locks the same in this projected position. The cone 73 may now be disengaged from the pin head as the pin is firmly held between the spindle 53 and center 71.

After the pin is thus mounted it is ready for the trimming operation.

As before stated, the table 46 is slidably mounted upon the base 15. In order to provide for sliding adjustment of the table 46, an operating lever 74, shown in detail in Fig. 12 is pivotally mounted by means of a bolt 75 on the under side of the top 20 of the base 15. The pivot bolt 75 passes through a bore 76 in a boss 77 formed at the end of said lever 74. The pivot bolt 75 threads into a boss 78 formed at one side of the slot 48 approximately midway of the ends of the ribs 50 and the lever extends transversely across the slot 48 and through an elongated opening 79 in the side 16 of the base, the free end of the lever being formed with a hand grip 80. The lever 74 is pivotally secured to the under face of the rib 47 of the table 46 by means of a pivot bolt 81 which extends through a slightly elongated slot 82 formed in a boss 83 which is provided on the lever 74 a short distance from the boss 77. It will be evident that movement of the lever 74 about the pivot 75 will result in a corresponding reciprocal motion of the table 46.

A transversely movable end cutter 84 is mounted upon an upstanding arm 85 pivotally supported at its lower end between upstanding bracket ears 86 by means of a pivot pin 87. The ears 86 are bolted to the table 46 at one side thereof and adjacent the motor 23. The upper end of the arm 85 is provided with a handle 88 to be grasped by the operator in moving the cutter 84 to the work and the lower end of the arm is provided with a rearwardly extending projection or stop 89 adapted to contact with the table 46 to limit rearward movement of the cutter. A forwardly extending lip 90 is also formed with the lower end of the arm 85 and is provided with an adjustable stop bolt 91 which limits forward movement of said arm.

The base 46 is provided with a laterally extending projection 92 at one side thereof, this projection being provided with perforated bosses 93 and 94 one at the extremity and one intermediate of said extension. A swinging cutter arm 95 is provided with a perforated boss 96 at one end thereof and with a second perforated boss 97 spaced from said end. The arm 95 is pivoted to the extension 92, the pivot bolt 98 passing through bosses 97 and 94 when one size pin is being operated upon and through bosses 96 and 93 when the other size pin is being treated.

The arm 95 has a handle 99 formed at the free end thereof and is formed with an upstanding cutter support 100 intermediate of its ends. A suitable cutter 101 is secured to this projection, said cutter being utilized to trim the lower portion of the sides of the pin. A depending bearing portion 102 also formed with said arm 95 is adapted to bear against a milled curved track 103 on the plate 46 so as to steady the arm during the cutting operation.

In operation, a worn bowling pin is placed on the supports 35 and 36 at the left end of the machine, with the base of the pin disposed in the ring 37 and the head resting on the member 39 is illustrated by dotted lines in Fig. 1. The operator, grasping the head of the pin and holding the same in the cradle 39 urges the pin towards the drill 27 and reamer 28 the sliding supports 35 and 36 moving therewith against the action of the spring 42. When the bottom of the pin has been drilled and countersunk to the proper depth, the pin is removed and mounted between the head spindle 53 and tail spindle 61 as illustrated in full lines in Figs. 1, 2 and 3. The table 46 is first adjusted to the proper position by means of lever 74 and handle 80, the motor started, and the end cutter 84 is then brought across the lower end of the pin to even off the bottom thereof. The handle 99 is then swung to the right to bring the cutter 101 into operation to trim the lower sides of the pin to the proper dimensions. The cutters having been set by gauge, the operation may readily be performed by a relatively inexperienced and unskilled person.

Although a preferred embodiment of the invention has been shown and described, it will be understood that various changes in the details of construction may be made without departing from the spirit of the invention as defined by the appended claims.

I claim:

1. In a device of the character described, a base, an electric motor mounted thereon, a head spindle carried by the motor shaft, a tail spindle mounted on said base in opposed relation thereto, said spindles co-operating to mount said pin, a carriage mounted on said base for sliding adjustment between said spindles, a cutter mounted on said carriage for movement transversely of the base of said pin, a second cutter mounted on said table for movement in a curved path longitudinally of said pin and in fixed relationship to said first cutter.

2. In a device of the character described, a base, an electric motor mounted thereon, a head spindle carried by the motor shaft, a tail spindle mounted on said base in opposed relation thereto, said spindles co-operating

to mount said pin, a carriage mounted on said base for sliding adjustment between said spindles, a cutter mounted on said carriage for movement transversely of the base of said pin, the carriage being provided with a lateral projection, an arm pivotally mounted on the projection, a second cutter mounted on the arm and swingable with the arm in a curved path longitudinally of the pin and in fixed relationship with said first-mentioned cutter.

3. In a device of the character described, a base, an electric motor mounted thereon, a head spindle carried by the motor shaft, a tail spindle mounted on said base in opposed relation thereto, said spindle co-operating to mount said pin, a carriage mounted on said base for sliding adjustment between said spindles, a cutter mounted on said carriage for movement transversely of the base of said pin, the carriage having a lateral projection, an arm, means on the arm and the projection for providing a plurality of pivotal connections between the arm and the projection, a second cutter carried by the arm for movement in a curved path longitudinally of the pin and in fixed relationship to the first-mentioned cutter, the plurality of mountings providing for various spacings of the cutter from the pin when different pins are operated on.

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