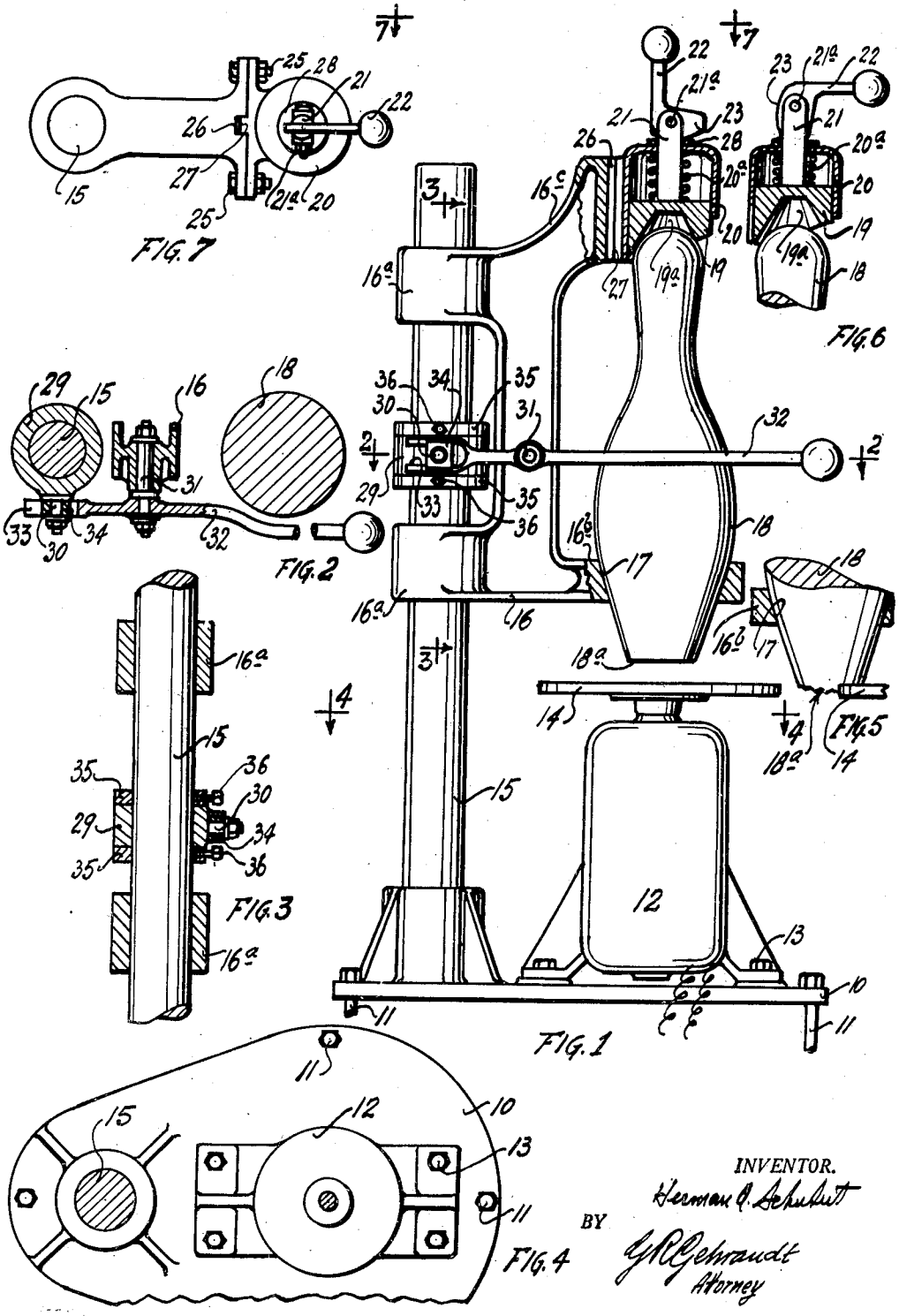
Dec. 6, 1949 H. A. SCHUBERT 2,490,480

BOWLING PIN RECONDITIONING MACHINE

Filed March 6, 1947 2 Sheets-Sheet 1



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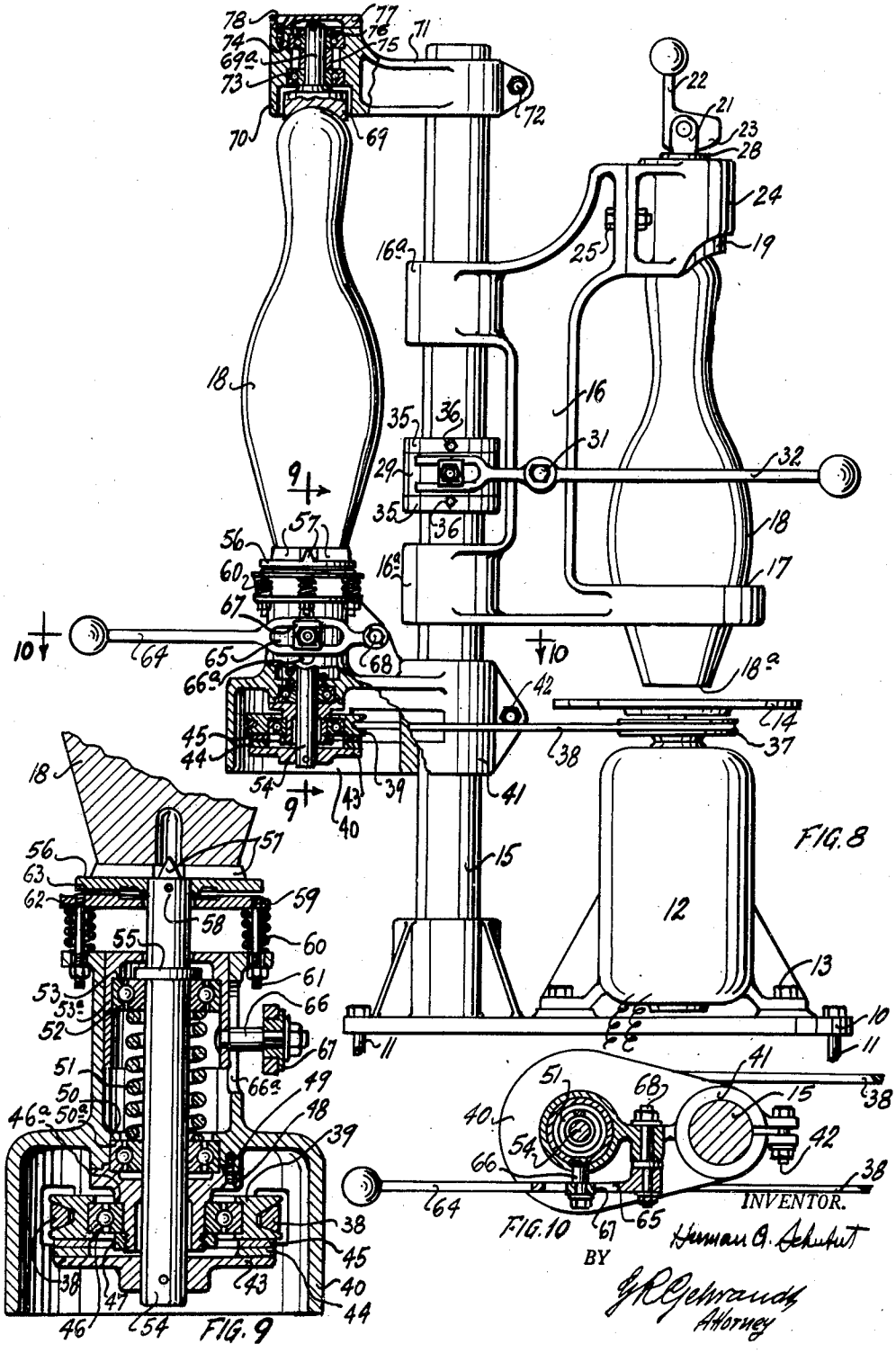

FIG. 8

FIG. 9

FIG. 10

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BOWLING PIN RECONDITIONING MACHINE

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2 Claims. (Cl. 51—124)

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In the game of bowling the pins become damaged in a short time either by being struck by the balls or by each other, and must either be replaced by new pins, and if possible the damaged pins must be reconditioned, either by resquaring the bottoms thereof to insure proper alignment of the pins when set up, or they must be resurfaced, or both.

The present method of squaring the bottoms of the pins is to place them in an ordinary wood working lathe, which usually requires the services of a skilled workman, to insure accurate work. Such a method is not only time consuming but is expensive.

It is one of the objects of the present invention to overcome these difficulties and objections and to provide an improved machine for performing such work which does not require the attention of, or operation by a skilled mechanic, but which will be simple and compact in construction, and effective and efficient in operation.

A further object is to provide an improved machine of this character, the work performing parts of which are continuous in operation, and which does not require the application of, and shutting off of the power, when the pin is being placed into or removed from the machine, and with which machine the work is greatly accelerated from the methods now employed for reconditioning bowling pins.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination, and arrangement of the several parts, hereinafter more fully described and claimed and shown in the accompanying drawings, exemplifying this invention, and in which

Figure 1 is a view in side elevation of a machine of this character embodying this invention, and with parts broken away.

Figure 2 is a detail sectional view on line 2—2, Figure 1.

Figure 3 is a detail sectional view on line 3—3, Figure 1.

Figure 4 is a detail sectional view on line 4—4, Figure 1.

Figure 5 is a detail fragmentary view showing the bottom of a bowling pin being refinished.

Figure 6 is a detail sectional view showing the position of the holding means for the pin while the pin is being removed from the machine.

Figure 7 is a top plan view taken on the line 7—7, Figure 1, with parts omitted.

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Figure 8 is a view partly in side elevation, partly in section and partly broken away of a modified form of the invention.

Figure 9 is an enlarged detail sectional view on line 9—9, Figure 8.

Figure 10 is a detail sectional view taken on line 10—10, Figure 8.

Referring more particularly to the drawings and to the form of the invention shown in Figures 1 to 7, the machine consists essentially in a supporting base 10, which may be anchored by means of suitable anchoring devices 11, such as bolts or the like.

A motor 12, is secured to the base by fastening devices 13, and connected to the motor shaft, so as to rotate about an upright axis is an abrading or finishing device such as a disc 14 which may be of any suitable diameter and of any suitable construction, carrying any suitable abrading material.

Rising from and supported by the base 10 is an upright or column 15, which is also of any desired diameter and length. A bracket or support 16 provided with spaced bearings 16a to receive the upright 15, is slidably mounted thereupon and is also adapted to be swung about the upright as a pivot. One arm 16b of the bracket is provided with an opening 17, therethrough, of any suitable configuration, to receive the lower end of a bowling pin 18, and so that the end 18a will project therethrough for any desired extent, the opening 17 being disposed above the abrading disc or element 14, so that when the bracket is raised or lowered upon the upright 15, the end 18a of the bowling pin will be moved out of or into engagement with the abrading element.

A holding cap or member 19, provided with a socket 19a, is arranged within a housing 20 and is provided with a stem 21, that projects through the top of the housing, and pivotally connected to the stem outside of the housing as at 21a is a handle or operating lever 22, having an arm 23, that is adapted, when the lever is turned in one direction about its pivot to engage the housing wall (Figure 6), to draw the cap 19, into the housing, at the same time compressing the spring 20a that encompasses the stem 21.

This housing and cap are secured to the other arm 16c in any suitable manner, such as by means of a groove and tongue connection 26, 27, and fastening bolts 25, secure these parts in such a manner that if desired, the housing 20 may be adjusted vertically with respect to the arm 16c of the bracket 16. A washer 28 may, if desired, be provided in the housing 20, to be engaged by

the end of the arm 23, of the handle or lever 22.

A collar 29, is loosely fitted upon the upright 15, and is provided with a trunnion pin 30, which supports a block 34, which engages in a forked or slotted end 33, of a lever 32, the latter being pivotally mounted intermediate its ends upon a pivot pin 31, that is secured to the bracket or support 16. When the lever 32, is moved about its pivot 31, the block 34 will slide in the slot or bifurcation 33. Secured to the upright 15 on opposite sides of and in close proximity to the collar 29, are collars 35, secured against movement with respect to the upright, by means of suitable fastening devices 36, such as screws or the like, so that the collar 29, may be freely turned on the upright 15. These collars also serve as a means to anchor the collar 29, the block 34, and pivot 30 will then serve as a fulcrum for the lever 32. When the free end of the lever 32 is raised, the bracket or support 16 will also be raised, and when depressed, the bracket will also be lowered to lower the end of the bowling pin into contact with the abrading element 14.

Thus it will be seen that the abrading element may be continuously rotated, and when the bowling pin 18, is placed in the seat 17, with the end 18a projecting therethrough, and with the bowling pin clamped or secured in this position with respect to the bracket 16, by means of the clamping or holding elements, 19, 20, 21 and 22, the bracket or support 16 may be lowered by the lever 32, to cause the end 18a, of the pin to contact the abrading element 14 (see Figure 5). When the work is finished, the lever 32, is moved in the opposite direction to raise the bracket or support 16, to the position shown in Figure 1. The lever 22, may then be operated or moved from the clamping position shown in Figure 1 to the unclamping position shown in Figure 6, to permit the bowling pin to be removed.

In the form of the invention shown in Figures 8 to 10 there is provided a pulley 37, on the motor shaft over which an endless belt 38, passes, and said belt also passes over another pulley 39, disposed within a housing 40, which in turn is secured to the upright 15, by means of clamping means 41, through the medium of a clamping bolt 42, or the like.

A friction clutch disc 43, is provided with a friction lining 44, which is adapted to engage a friction element 45, secured to the face of the pulley 39. A ball bearing 46, is fitted to a hub 48, carried by the housing 40 and secured in position by screws 49, and the bearing is held in position by engaging a shoulder 46a and a collar 47, which latter engages a threaded portion on the hub 48. A shoulder 50, is provided in the housing against which another ball bearing 50a engages and is held in position by the hub 48. A spring 51, engages the bearing 50a and also presses against another and spaced ball bearing 52, and tends normally to hold the latter bearing against a shoulder 53 on a sleeve 53a. A shaft 54, passes through the bearing 52, spring 51, bearing 50a, hub 48, and to it is secured the clutch disc 43 so that the shaft will be rotated by the disc 43, when the latter is in frictional engagement with the pulley 39. The shaft 54, is provided with a collar 55, which takes the vertical thrust, and the end of the shaft beyond said collar passes through and beyond the end of the sleeve 53a.

Secured to the end of the shaft 54 is a knife disc 56, provided with knives 57, to engage the end of the bowling pin to hold it in operative connection with the shaft 54, the disc being fastened to the shaft in any suitable manner as by means of a pin or fastening device 58.

A brake disc 59, is supported by the top of the housing 40, by means of springs 60, held in position by means of tension bolts or members 61. A friction disc or brake lining 62, may be provided on the disc 59, that may be engaged with a friction element 63, on the knife disc 56, the proper clearance between the friction elements 62 and 63 may be controlled by adjustments of the nuts of the tension springs 60. A lever 64, provided with a slot 65, in which a block 67 slides to allow for a certain rectilinear movement of the lever when the latter is moved up and down. A pin 66 is connected to the sleeve 53a, that passes through a slot 66a in the housing 40, and engages the block 67 in the slot 65 of the lever 64, so that up and down movement of the lever will be imparted to the sleeve. A fulcrum pin 68, is carried by the housing 40, on a suitable stationary part of the machine, for the lever 64.

At the top of the upright or standard 15 is a holding cap or member 69, for maintaining the bowling pin in position, and is arranged within a housing 70, supported by a bracket 71, clamped in position by a fastening device or element 72. The housing 70, is fitted with ball bearings 73, 74 separated by a sleeve 75, and a collar 76, is fastened to the end of the shaft 69a on the cap 69. A cap 77, is provided for the housing 70, and is removably held in position by a suitable fastening device, such as a screw 78.

It is thought the operation of this improved machine will be clearly understood from the foregoing description, but briefly stated it is as follows:

The damaged bowling pin is placed into the seat 17, after the holding cap 19 has been moved to the position shown in Figure 6, by swinging the lever 22 about its pivot 21a, as shown. When the bowling pin is in this position the lever 22 is moved to the position shown in Figure 1, and it will clamp the bowling pin and firmly hold it by the full pressure of the spring, 20a. The motor 12, may then be operated and may be kept in operation as long as there is work to be done. With the bowling pin in its seat it may now be brought into contact with the abrading element 14, by operating the lever 32, in a downward direction towards the element 14, or the bowling pin may be moved sidewise, by swinging the bracket 16, about the upright or standard 15, as a pivot, as shown in Figure 5. As the motor 12, is rotated at a high rate of speed the work will be performed in a short time and no special skill will be required to move the bowling pin to and from the abrading element, which element is continuously rotated until the work is completed.

In case the upper surface or periphery of the bowling pin is to be refinished, then the machine illustrated in Figure 1, may be equipped with an additional fixture for rotating the bowling pin for working on such surface. By engaging the knife disc 56, with the brake disc 59, and disengaging the friction clutch element 43, from the pulley 39, this will permit seating of the bowling pin upon the knife edges 57, and the spring 51 will press the bowling pin against the holding cap 69. By moving the lever 64 upwardly will disengage the brake element 59 from the disc 63, and will raise the friction clutch disc 43, into engagement with the pulley 39, thereby causing the bowling pin to be rotated by the pulley 39,

through the medium of the shaft **54**, and knife edge disc **56**.

While the preferred forms of the invention have been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:

1. In a machine for reconditioning a surface of a bowling pin, a supporting base, an upright, a motor driven abrading element upon the base, a bracket mounted upon the upright for movement lengthwise thereof above said abrading element and also about said upright as a pivot, there being an opening in the bracket forming a seat for the bowling pin through which one end of the bowling pin projects, means also on the bracket for engagement with the other end of the pin to clamp it in said seat, means for moving said bracket lengthwise of the upright and for swinging it about the upright as an axis, the last said means embodying a collar loosely mounted on the upright, fixed collars on opposite sides of the loose collar, a lever pivotally connected at one end to the loose collar, and a fulcrum for the lever on the said bracket.

2. In a machine for reconditioning a surface of a bowling pin, a supporting base, an upright, a motor driven abrading element upon the base, a bracket mounted upon the upright for movement lengthwise thereof above said abrading element

and also about said upright as a pivot, there being an opening in the bracket forming a seat for the bowling pin through which one end of the bowling pin projects, means also on the bracket for engagement with the other end of the pin to clamp it in said seat, means for moving said bracket lengthwise of the upright and for swinging it about the upright as an axis, the last said means embodying a collar loosely mounted on the upright, fixed collars on opposite sides of the loose collar, a lever pivotally connected at one end to the loose collar, and means pivotally connecting said lever intermediate its ends to the said bracket whereby to form a fulcrum for the lever.

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