July 15, 1952 J. J. SCHEPPE 2,603,487

PINCAGE ASSEMBLY FOR BOWLING PIN SETTING MACHINES

Filed June 13, 1949 3 Sheets-Sheet 1

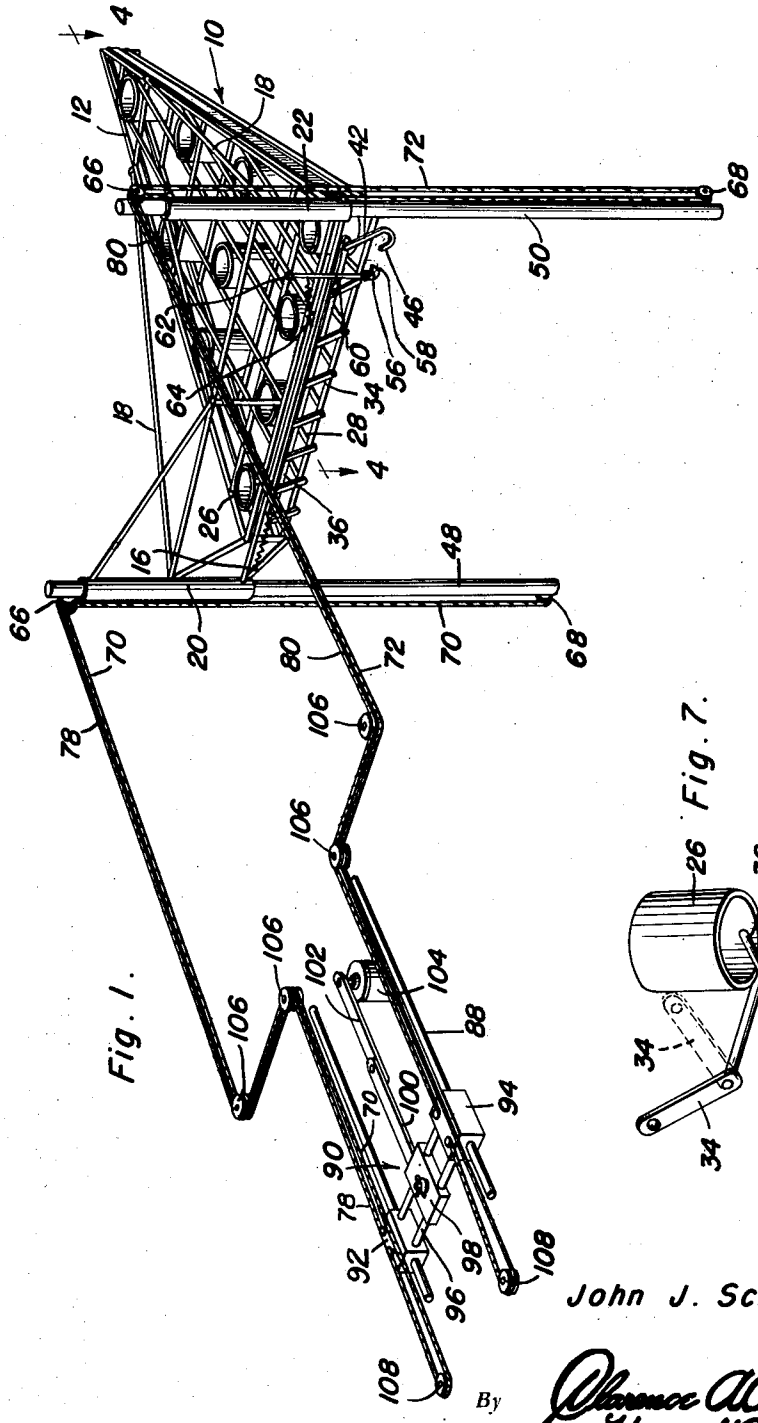


Fig. 1.

Fig. 7.

Inventor

John J. Scheppe

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

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Filed June 13, 1949 3 Sheets-Sheet 2

Fig. 2.

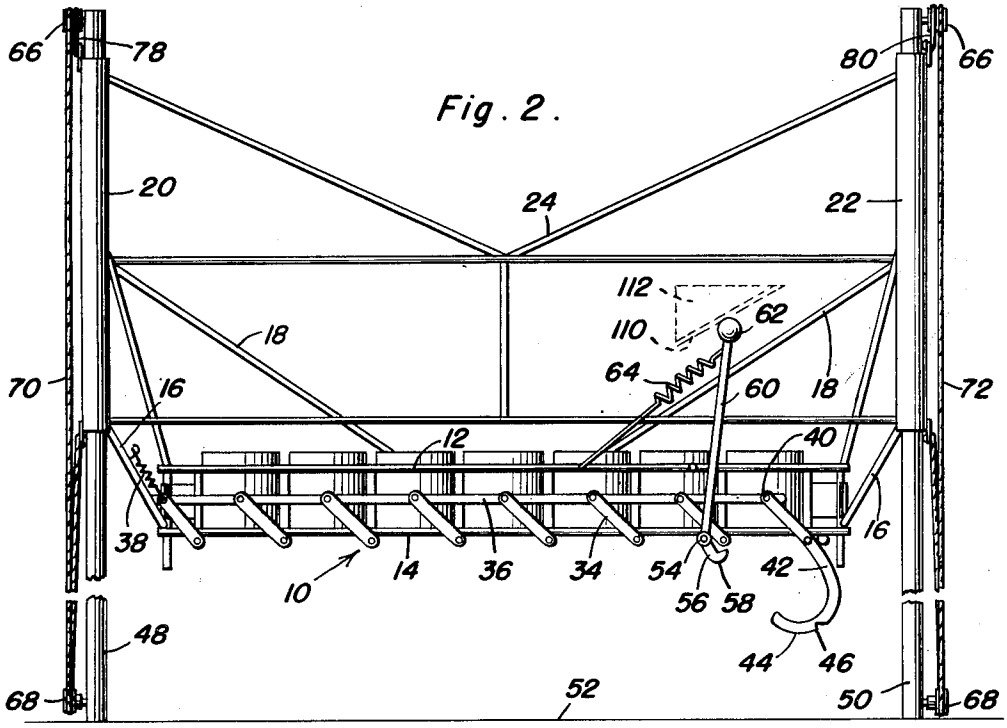
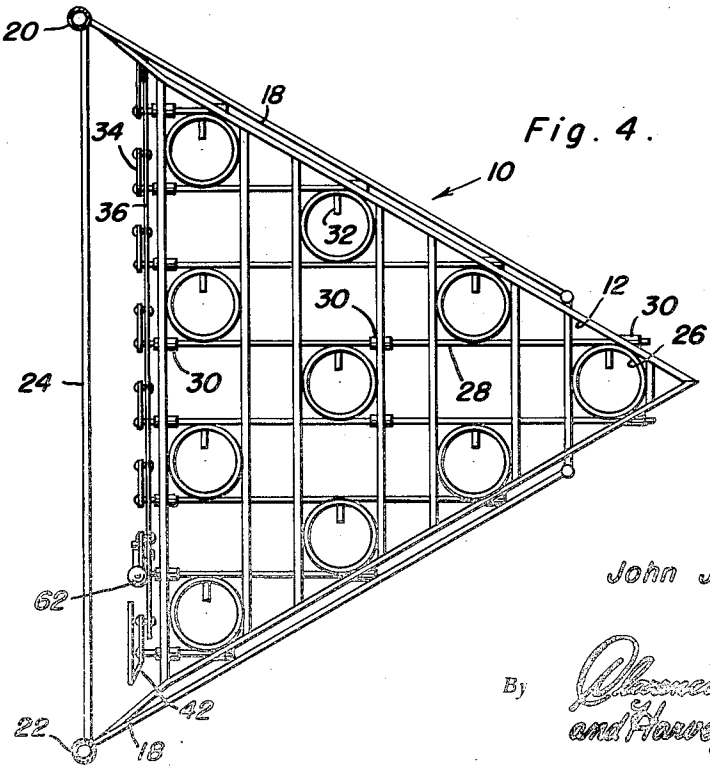


Fig. 4.



Inventor

John J. Scheppe

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

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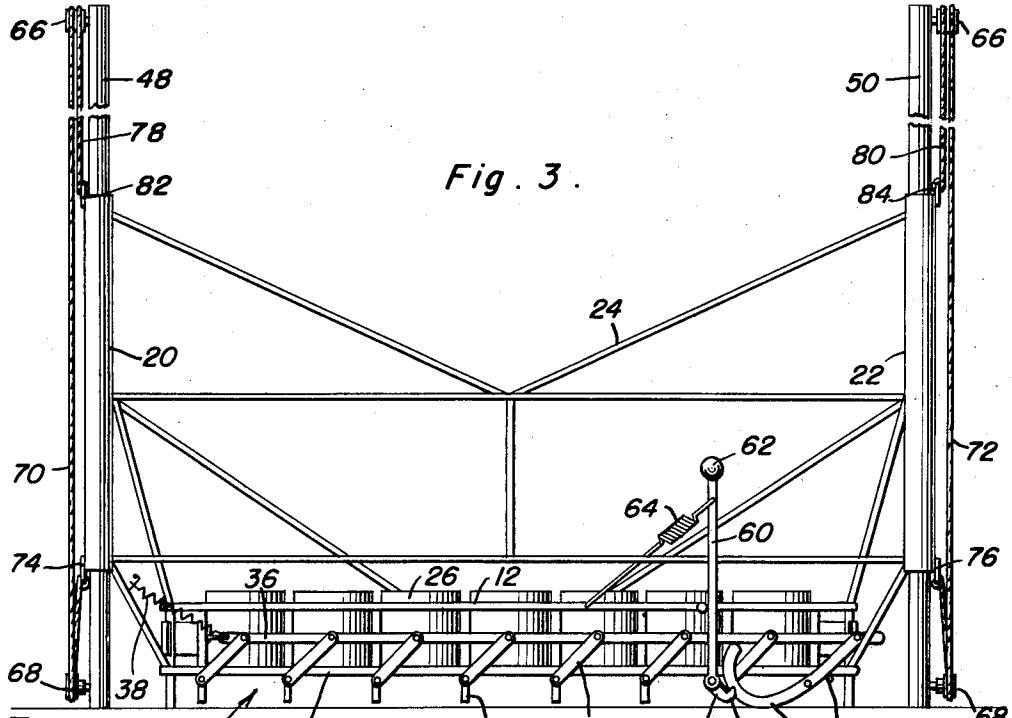


Fig. 3.

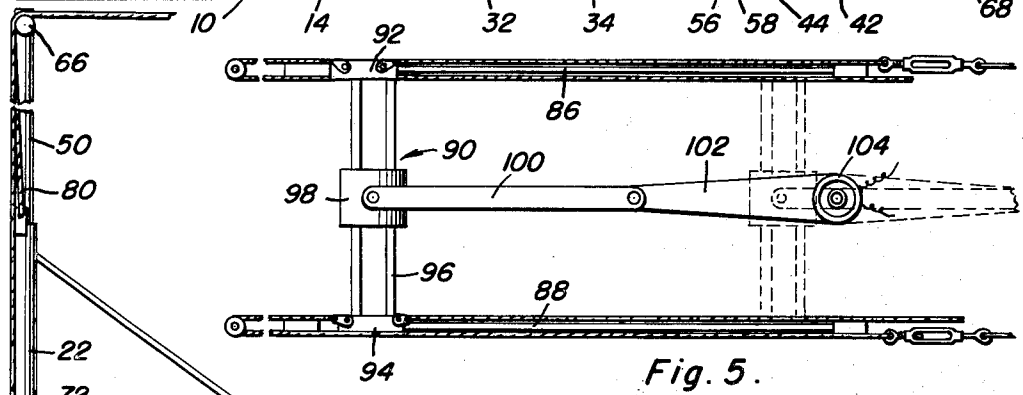


Fig. 5.

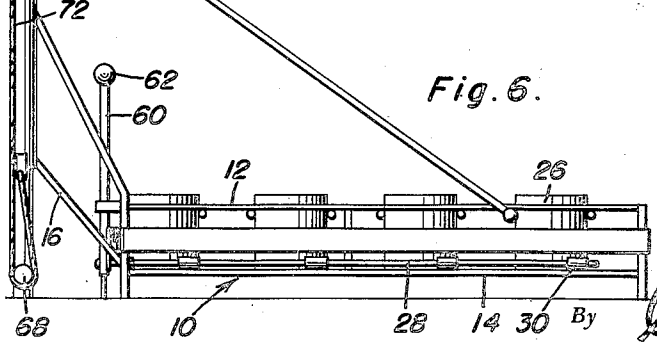


Fig. 6.

Inventor

John J. Scheppe

By Clarence O'Brien and Harvey B. Jacobson

Attorneys

Patented July 15, 1952 2,603,487

UNITED STATES PATENT OFFICE

2,603,487

PINCAGE ASSEMBLY FOR BOWLING PIN SETTING MACHINES

John J. Scheppe, Trenton, N. J.

Application June 13, 1949, Serial No. 98,780

2 Claims. (Cl. 273—42)

1

This invention relates to new and useful improvements in bowling pin setters and the primary object of the present invention is to provide an apparatus for receiving a group of bowling pins and automatically releasing and placing the bowling pins, in their proper arranged position, upon an alley.

Another very important object of the present invention is to provide a pin cage assembly for bowling pin setters including a vertically movable pin receiving and supporting frame construction and embodying novel and improved means for releasing the pins after the frame has been lowered relative to an alley.

Yet another object of the present invention is to provide a bowling pin placing apparatus including a vertically movable frame having a means for retaining pins thereon, and means for raising and lowering the frame so that pins can be spotted upon an alley.

A further object of the present invention is to provide a pin cage assembly for bowling pin setting machines including a reciprocating bowling pin holding frame that is movable, vertically, toward and away from an alley and a floor or alley contacting member that will effect a releasing of the pins as the said member contacts a floor or alley.

A still further aim of the present invention is the provision of a pin cage assembly for bowling pin setters that is simple and practical in construction; strong and reliable in use; efficient and durable in operation; small and compact in structure; neat and attractive in appearance; relatively inexpensive to manufacture, install and operate; and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a diagrammatic perspective view of the present invention;

Figure 2 is a fragmentary rear elevational view of the pin cage assembly used in conjunction with the present invention, and showing the pin receiving frame in a raised position;

Figure 3 is a view similar to Figure 2 and showing the pin receiving frame in a lowered position;

Figure 4 is a top plan view of the present pin cage assembly;

Figure 5 is a fragmentary top plan view showing the means employed in conjunction with the present invention for raising and lowering the pin receiving frame;

2

Figure 6 is a side elevational view of Figure 3; and

Figure 7 is a fragmentary perspective view showing the manner in which pins are supported within the pin receiving buckets or sleeves.

Referring now to the drawings in detail, wherein, for the purpose of illustration, there is disclosed a preferred embodiment of the present invention, the numeral 10 represents, generally, the pin cage or vertically movable pin receiving frame that is used in conjunction with the instant invention. This frame 10 consists of triangular upper and lower grid members 12 and 14 that are composed of a plurality of intersecting and joined rods.

The grid members 12 and 14 are spaced parallel to each other and include rearwardly extending projections 16 and 18, at their rear corners, to which there is secured, by welding or the like, a pair of spaced parallel tubular members 20 and 22. The tubular members 20 and 22 are braced to each other by any suitable framework 24.

A group of vertically disposed pin receiving sleeves or buckets 26 are secured to the upper and lower grid members 12 and 14. The sleeves 26 are spaced relative to each other a distance commonly established for tenpins or duckpins so that the sleeves in each row will be staggered with respect to the sleeves of an adjacent row, as shown best in Figure 4 of the drawings.

Means is provided for supporting pins in the sleeves 26 and this means consists of a plurality of spaced parallel, longitudinally extending rods 28 that are journaled in suitable bearings or sleeves 30 secured to the under surface of the grid member 14.

Laterally extending fingers or elongated guard members 32 are fixed to the rods 28 and these fingers 32 are so arranged as to provide one finger for each of the sleeves 26. The rods 28 are disposed below the lower ends of the sleeves 26 and the fingers 32 are swingable in an arc toward the lower ends of the sleeves.

The rear ends of the rods 28 support laterally projecting arms 34 that are disposed in a vertical plane spaced parallel to a plane through the tubular members 20 and 22. The arms 34 are fixed to the rods 28 and are pivoted to an operating bar 36 that is spaced above and perpendicular to the rods 28.

An elongated spring member or coil spring 38

is terminally secured to the frame 10 and to one end of the operating bar 36 and urges the operating bar leftward as shown in Figure 2 to incline the arms 34, rotate the rods 28 and cause a raising of the fingers 32 to their pin supporting positions, as shown in Figures 2 and 4.

At the other end of the operating bar 36 from the spring member 38 there is pivoted, as at 40, the shank portion of a floor or alley contacting member or hook member 42 having an arcuate bearing surface or cam surface 44 in which there is provided a recess 46.

Uprights 48 and 50 rise from the floor or alley 52 and slidably receive the tubular members 20 and 22 so that the frame 10 will be guided during its vertical movement toward and away from the alley 52.

Pivoted as at 54 to the rear portion of the lower grid member 14 is a latch 56 having a hook portion 58 that will ride against the arcuate bearing portion 44 of the hook member 42 as the latter is pivoted upwardly upon contacting the alley during lowering of the frame 10. The hook portion 58 will enter the recess 46 to hold the hook member 42 raised relative to the frame 10.

A lever 60 is secured at its lower end to the latch 56 and the upper end of the lever supports a spherical element 62 for a purpose later to be described. A spring 64 secures the lever 60 to the upper grid member 12 and urges the latch 56 toward the hook member 42.

Means is provided for raising and lowering the frame 10 and this means consists of upper and lower guide pulleys 66 and 68 that are secured to the end portions of the uprights 48 and 50. A first pair of cables 70 and 72 have their forward ends secured to eyes 74 and 76 on the lower ends of the tubular members 20 and 22 and these cables or flexible elements 70 and 72 are trained under the lower guide pulleys 68 and over the upper guide pulleys 66.

A second pair of flexible elements or cables 78 and 80 are trained over the upper guide pulleys 66 and the forward ends of the second pair of flexible elements 78 and 80 are secured to eyes 82 and 84 at the upper ends of the tubular members 20 and 22.

Mounted upon suitable support disposed rearwardly of the uprights 48 and 50 is a pair of spaced parallel, substantially horizontal guide frame forming bars 86 and 88 that slidably support a sliding member 90. The sliding member 90 is composed of a pair of blocks 92 and 94 that are formed with longitudinally extending bores that receive the bars 86 and 88.

A group of connecting bars 96 join the blocks 92 and 94 to a further block 98 fixed to the bars 96 between the blocks 92 and 94. One end of a link or pitman 100 is pivoted to the block 98 and the other end of the link 10 is pivoted to one end of a rotatable arm 102. The remaining end of the arm 102 is fixed to the drive shaft of a motor 104 so that when the motor is in operation the arm 102 will rotate to reciprocate the blocks 92, 94 and 98.

The cables 70 and 72 are trained over suitable forward guides 106 and rear guides 108 and are secured to the rear ends of blocks 92 and 94. The cables 78 and 80 are also trained over the guides 106 and are secured to the forward ends of the blocks 92 and 94 so that as the blocks 92 and 94 move rearwardly and away from the uprights 48 and 50 the frame 10 will be raised, whereas a forward movement of the blocks 92 and 94 will effect a lowering of the frame 10.

In practical use of the present invention, the frame 10 is raised and pins are placed in the sleeves 26 to be supported within the sleeves by the fingers 32. As the frame 10 is lowered, the hook member 42 will engage the alley 52 and will swing toward the latch 56.

The upward swinging movement of the hook member 42 will cause the operating bar 36 to move against action of the spring 38, the rods 28 will rotate and the fingers 32 will pivot downwardly to release the pins (not shown) and the pins will be placed upon the alley.

A continued upward swinging movement of the hook member 42 will cause the hook portion 58 of latch 56 to enter the recess 46 and retain the hook member raised.

Due to the arrangement of the arm 102 and link 100, after the pins have been released, the frame 10 will be raised. During the raising of the frame 10, the spherical element 62 will ride against the cam surface 110 of a stop 112, mounted above the alley 52, to force the hook portion 58 from the recess or notch 46 and the spring 38 will return the operating bar 36, rods 28 and fingers 32 to their normal positions so that further pins can be placed in the sleeves 26.

Having described the invention, what is claimed as new is:

1. A pin cage assembly for automatic bowling pin setters, said pin cage assembly comprising a plurality of uprights, a vertically movable frame slidably mounted on said uprights and including a group of pin receiving sleeves, a plurality of rods journaled on said frame for rotation and having laterally projecting fingers mounted thereon, means acting on said rods and urging said fingers to a position for supporting pins in said sleeves, a floor contacting member carried by said first-named means for engaging an alley to rotate the rods and urge the fingers away from their pin supporting position upon lowering of said frame, means for receiving and holding the floor contacting member after the member has rotated the rods and urged the fingers away from their pin supporting position, means for releasing the means for receiving and holding the floor contacting member during raising of the frame, and means for raising and lowering the frame, said means for receiving and holding said floor contacting member including a latch pivoted to said frame and having a hook portion, said floor contacting member having an arcuate bearing surface for riding against said hook portion and a recess in said arcuate bearing surface for receiving the hook portion, and means urging said hook portion toward said arcuate bearing surface.

2. A pin cage assembly for automatic bowling pin setters said pin cage assembly comprising a vertically movable frame including a group of pin receiving sleeves, means carried by the frame and disposed beneath the sleeves for retaining a group of pins within the sleeves, a floor contacting member for actuating said means to release the pins retained within the sleeves, means for receiving and holding the floor contacting member after the latter has actuated said first-named means, said means for receiving and holding said floor contacting member including a latch pivoted to said frame and having a hook portion, said floor contacting member having an arcuate bearing surface for riding against said hook portion and a recess for receiving said hook portion, a lever secured to said latch, resilient means acting on said lever and urging said hook portion against the arcuate bearing surface, and cam

means for engaging the lever during the raising of the frame to move the lever against action of said resilient means and urge the hook portion from the recess.

JOHN J. SCHEPPE.

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