Jan. 18, 1927. 1,615,064

J. W. BISHOP

PIN SETTING MACHINE

Filed July 1. 1925 2 Sheets-Sheet 1

Fig. 1

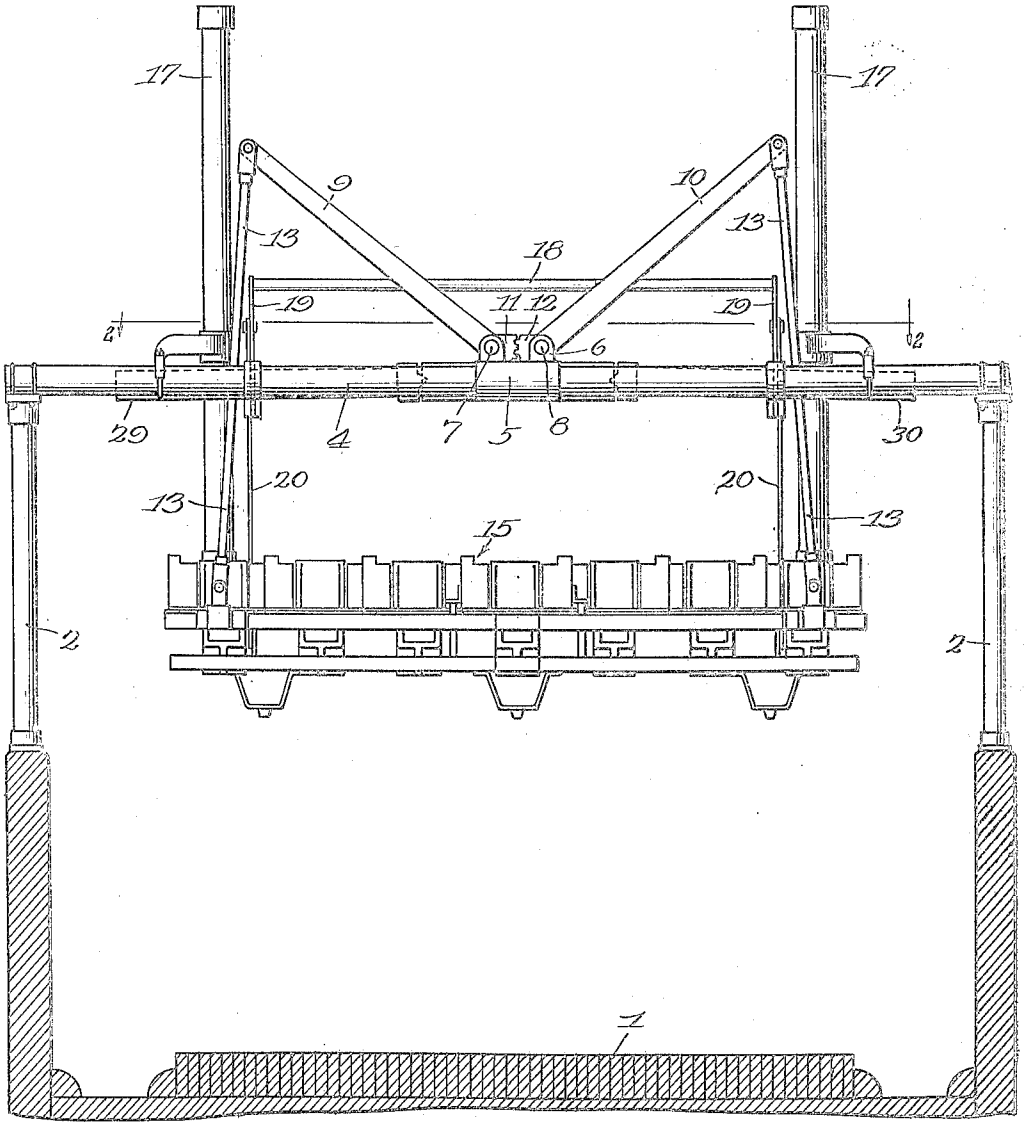

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Fig. 2

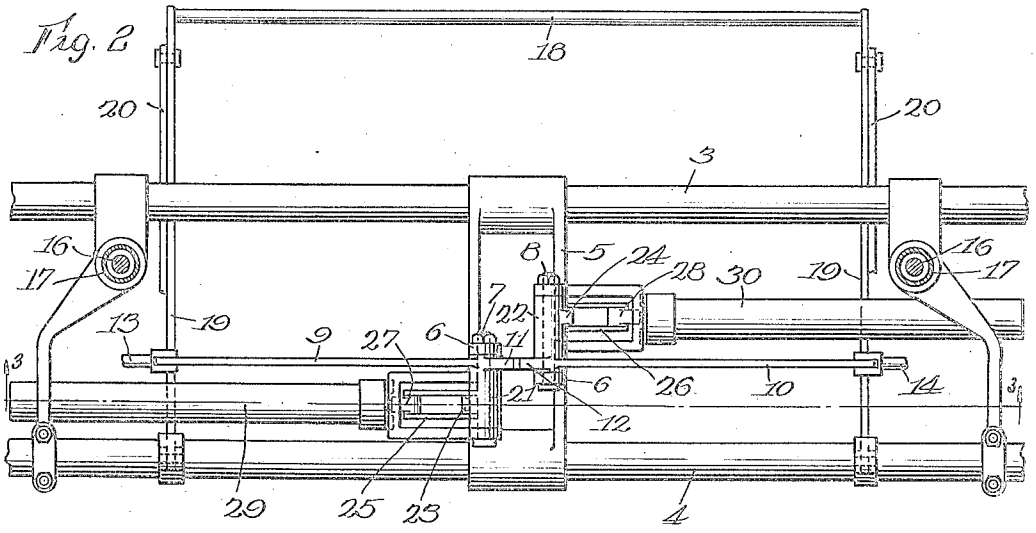
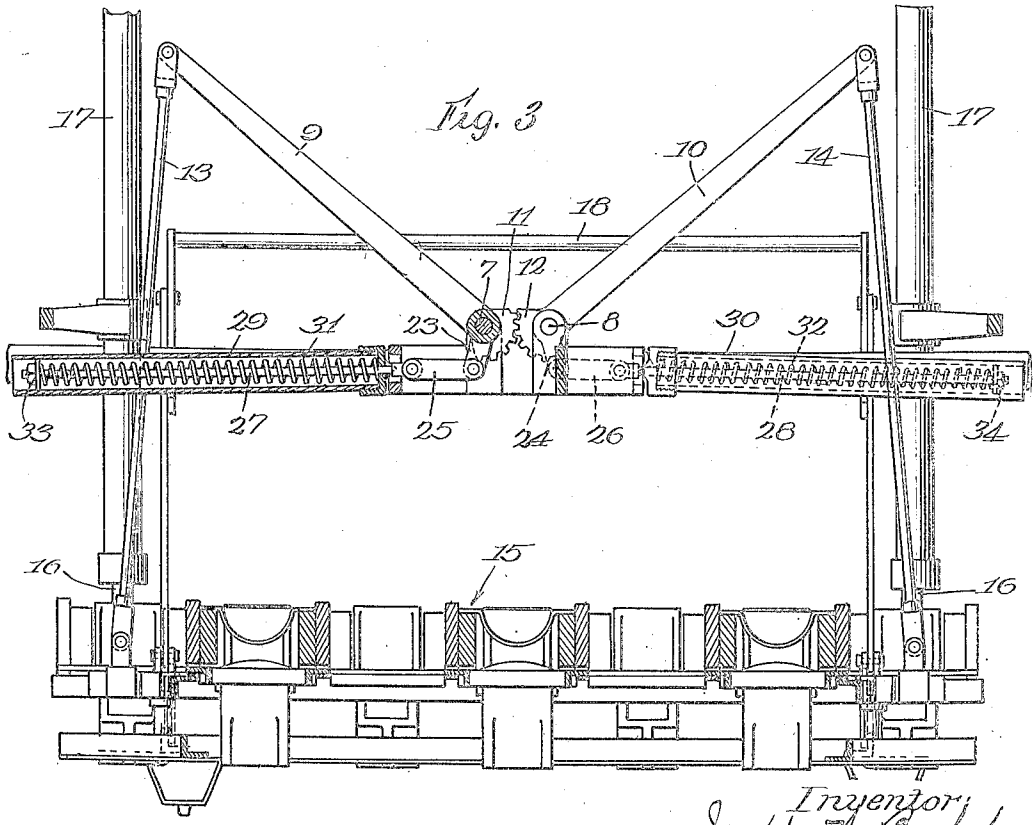


Fig. 3



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Patented Jan. 18, 1927. 1,615,064

UNITED STATES PATENT OFFICE.

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PIN-SETTING MACHINE.

Application filed July 1, 1925. Serial No. 40,727.

Pin setting machines of the hand operated type are usually controlled by counterweights arranged in front of the setter frame and rising and falling according as the frame is lowered or raised. The object of my invention is to provide a setter, particularly of the hand operated type referred to in which the counterweight is replaced by a spring operated means for returning the frame to its normal position above the alley bed.

Another object is to provide a device of the above character composed of a minimum number of parts and which shall be easily made and efficient in operation;

In the accompanying drawings in which I have shown a selected embodiment of my invention—

Fig. 1 is a front elevation of my invention as applied to an alley bed.

Fig. 2 is a section taken on the line 2—2 of Fig. 1, but drawn to a larger scale.

Fig. 3 is a section on the line 3—3 of Fig. 2.

Referring now to the drawings, I have shown at 1 an alley bed at the sides of which are placed posts 2 carrying cross-bars 3 and 4, these elements forming a frame on which the machine may be supported. Carried on the cross-bars 3 and 4 is a bracket 5 having thereon upstanding ears 6 supporting bolts 7 and 8, which form pivots on which are mounted levers 9 and 10 extending transversely of the alley bed.

The levers 9 and 10 are provided beyond their pivots with intermeshing segment gears 11 and 12, whereby the levers will move in unison. Pivoted at the ends of the levers 9 and 10 are links 13 and 14 secured at their lower ends to the setter frame, which I have designated generally as 15. This frame is of the type shown and described in my co-pending application Serial No. 16,332, filed March 18, 1925 and for the purpose of the present application need not be further described. The frame is provided with suitable guide rods 16 sliding in guide tubes 17, as disclosed in my aforesaid co-pending application, this arrangement insuring movement of the frame in a vertical direction.

As well understood in the art, the setter frame is adapted to contain bowling pins, which are placed therein when the frame is in the raised position, shown in Fig. 1 and which are deposited on the proper spots on the alley bed when the frame is lowered. Any suitable means may be provided for releasing the pins from the frame. For the purpose of lowering the frame I provide the handle 18 pivoted to the cross bar 4 by suitable arms 19 and connected to the frame by links 20.

The levers 9 and 10 are provided with hubs 21 and 22 respectively and formed integral with these hubs are arms 23 and 24 connected to links 25 and 26 pivotally secured at their outer ends to rods 27 and 28 mounted to slide in cylinders 29 and 30 respectively. Surrounding rods 27 and 28 are springs 31 and 32, the tension of which may be adjusted by suitable means exemplified by the nuts 33 and 34 threaded on the ends of the rods.

It is believed that the operation of the device will be obvious from the above description, but it will be briefly summarized as follows: Upon actuation of the handle 18 to lower the setter frame 15, the frame will pull downwardly on the links 13 and 14, thus causing the levers 9 and 10 to rotate on the pivots 7 and 8 and compress the springs 31 and 32. Due to the intermeshing gears 11 and 12 the levers work in unison and the force exerted by each spring is uniformly distributed to each of the links 13 and 14. After the pins have been set on the alley bed, the handle may be released and the springs will then return the frame to its uppermost position, as shown in Figs. 1 and 3. During this movement each spring will do its full share of work due to the intermeshing gears. Moreover, it will be evident that by the above arrangement a plurality of small springs may be employed instead of one large spring.

From the above it will be apparent that I have provided a novel and improved pin setting machine which will operate in an efficient manner and which entirely eliminates the counterweight previously used. In actual practice I have found that my machine is very satisfactory as regards manufacture, operation and maintenance. It will be seen that the number of parts has been reduced to a minimum and that the cost of heavy expensive springs has been avoided by the use of a plurality of springs so connected to the machine as to have all parts of the lifting devices operated in uni-

son. While I have shown the device used with a particular type of setter frame, it is obvious that it may be employed with any other type without requiring any substantial modification. The cylinders containing the springs may be arranged in any desired position, but I have found the substantial horizontal position, as shown in the drawings as being very advantageous in operation and moreover it will be seen from an inspection of Fig. 1 that the cylinders are practically concealed from view behind the cross-bar 4 thereby adding to the appearance of the device by avoiding the presence of elements of the machine in a conspicuous place. A pin setting machine is of necessity placed in a conspicuous position and any arrangement of the parts thereof which will diminish its conspicuousness is desirable. It will be evident that the arrangement which I have devised achieves the above result. While I have shown my invention as being operated by compression springs, it is of course obvious that tension or other forms of springs may be used if desired, all that is necessary being an arrangement whereby a spring is stressed.

I am aware that changes in the form, construction and arrangement of parts may be made without departing from the spirit and without sacrificing the advantages of the invention and I reserve the right to make all such changes as fairly fall within the scope of the folowing claims.

I claim:

1. A pin setting machine comprising a setter frame, means to lower said frame to set the pins, and a plurality of springs compresed by the lowering of said frame and acting to raise the frame to its uppermost position upon release of said lowering means.

2. A pin setting machine comprising a setter frame, means to lower said frame to set the pins, and a plurality of springs compressed by the lowering of said frame and means causing said springs to act in unison to raise said frame upon release of said lowering means.

3. A pin setting machine comprising a frame adapted to set the pins, means to lift said frame to its uppermost position and comprising a plurality of springs and a plurality of members connected to said frame and each member acted on by one of said springs.

4. A pin setting machine comprising a setter frame, means to lift said frame and comprising a plurality of springs, a plurality of members connected to said frame and each member acted on by a spring, and means causing said members to move in unison whereby the action of said springs will be uniformly distributed to said members.

5. A pin setting machine comprising a setter frame, means to lift said frame and comprising two pivoted levers, gears on said levers intermeshing with each other, a spring acting on each lever, and connections between said levers and said frame, said spring being stressed by lowering of said frame.

6. A pin setting machine comprising a setter frame, means to lift said frame and comprising a plurality of levers, intermeshing gears on said levers, connections between said levers and said frame, and a spring connected to each of said levers and stressed by lowering of said frame.

7. A pin setting machine comprising a setter frame, a handle connected to said frame for lowering the same, a plurality of links connected to said frame, a lever pivoted to each of said links and pivotally supported above said frame, and a spring connected to each of said levers and stressed by lowering of said frame.

8. A pin setting machine comprising a setter frame, a handle connected to said frame for lowering the same, a plurality of links connected to said frame, a lever pivoted to each of said links and pivotally supported above said frame, a spring connected to each of said levers and stressed by lowering of said frame, and interengaging means carried by said levers to cause them to move in unison.

9. A pin setting machine comprising a frame adapted to set the pins, means to lift said frame and comprising a plurality of springs, and a plurality of members connected to said frame and each member acted on by one of said springs, said springs being disposed in a substantially horizontal position, for the purpose set forth.

JOSEPH W. BISHOP.