Dec. 16, 1952 H. M. BLACK 2,621,443

WALKING DOLL

Filed Jan. 9, 1950

Fig. 1

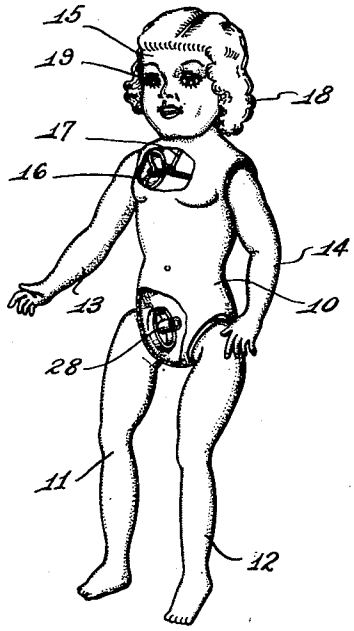


Fig. 2

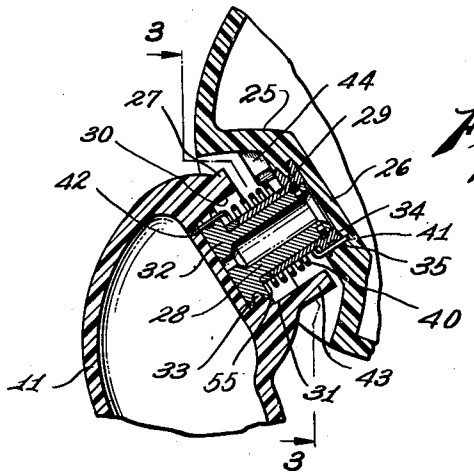


Fig. 3

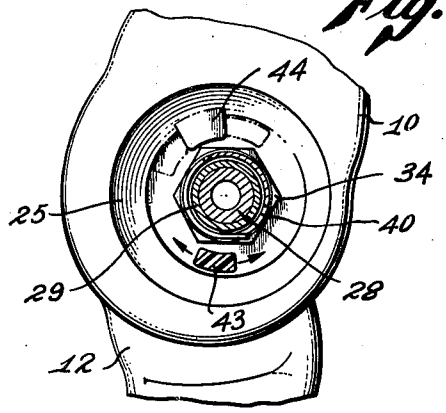


Fig. 4

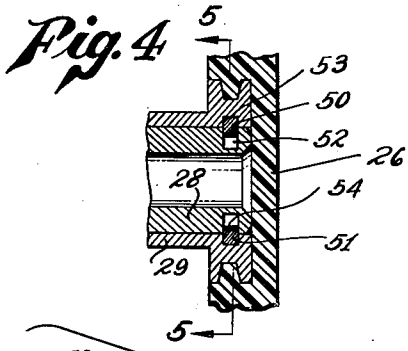


Fig. 5

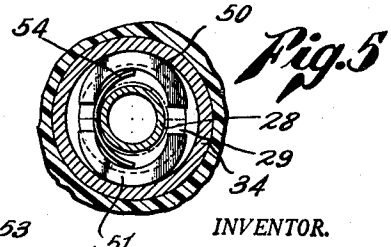
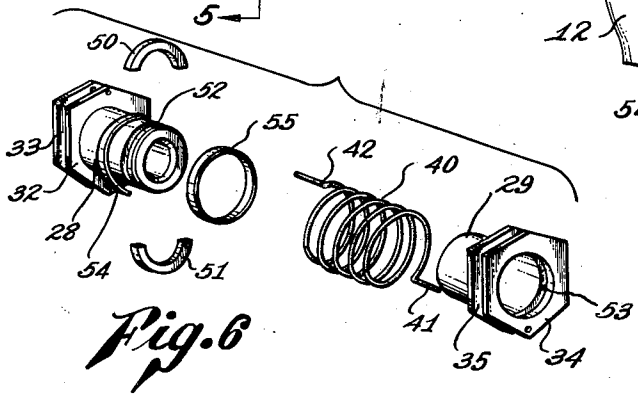


Fig. 6



INVENTOR.
HOWARD M. BLACK
BY
Attorney

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UNITED STATES PATENT OFFICE

2,621,443

WALKING DOLL

Howard M. Black, Los Angeles, Calif., assignor to Artisan Novelty Company, Gardena, Calif., a corporation of California

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5 Claims. (Cl. 46—149)

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My invention relates generally to toys, and more particularly, to an improved walking doll.

Many prior walking dolls have been constructed, some having self-contained power sources, such as the well-known windup motor, and others operated by advancing them across a flat surface. The former type are easily broken, and cannot be made realistic without becoming complex and expensive. This invention relates to dolls adapted to be moved by the child, and may be used in a doll of any desired form. The walking mechanism in no way interferes with the usual attractive characteristics of the doll, and is easily operated by a child.

The outstanding characteristic of walking is the oscillating movement of the legs which produces a translating movement of the person across a flat surface. There are, of course, many other complex responses such as the flexing of the knees and ankles, which characterize the walk of any live animal. To reproduce these complex motions in a simple and economical toy is obviously impossible, and need not be attempted to satisfy a child. If advancing the doll body causes the legs of the doll to move forwardly and backwardly in an alternate sequence, the simulation of walking is realistic to the vivid imagination of the child and the child is quite pleased. Prior walking toys have partially accomplished this result, but not without sacrificing many of the advantages of conventional dolls, such as stability, flexibility, and durability. Furthermore, many of the prior devices have been complex in operation and their manipulation beyond the comprehension of a small child. For these reasons, the prior devices have not been satisfactory, or attractive to children.

The legs of a walking doll must necessarily be pivotally connected to the body, and consequently the doll has a tendency to become unstable when standing erect or sitting. To overcome this instability, many of the prior devices have used complex interconnected leg joints which are easily broken, and destroy the usual freedom of leg action. For example, the legs will no longer both go forwardly or backwardly at the same time, and the doll cannot be made to sit with the legs in front thereof. In addition to these disadvantages, many of the prior devices are difficult to manipulate and may be easily broken by improper operation. Any doll will receive considerable rough usage, and its durability is one of the most important practical considerations. If the provision of a walking feature in the doll sacrifices its general utility, it is undesirable as a plaything for children.

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Accordingly, it is a major object of my invention to provide an improved walking doll which does not sacrifice the characteristics of a conventional doll having movable arms and legs.

Another object of my invention is to provide a walking doll which is unusually stable in either the erect or sitting position.

It is also an object of my invention to provide a walking doll that simulates walking in a realistic manner and may be manipulated by a small child.

A further object of my invention is to provide a doll on which the legs are easily attached, but impossible to detach.

Still another object of my invention is to provide a walking doll that is ruggedly and economically constructed and cannot be damaged by anything less than intended destruction.

A still further object of my invention is to provide an improved walking mechanism that can be used without modification in many different sizes and shapes of dolls, that is simple and compact, and has no external elements to cut or otherwise injure a child.

These and other objects and advantages of my invention will become apparent from the following detailed description of a preferred form thereof, and from an inspection of the accompanying drawings in which:

Figure 1 is a perspective view of my improved walking doll with the body in partial section to show the installation of the legs and arms thereon;

Figure 2 is a vertical cross-section of the doll body and the left leg, showing the connection therebetween;

Figure 3 is a vertical cross-section taken along the line 3—3 of Figure 2;

Figure 4 is an enlarged detail of a portion of the leg connection as shown in Figure 2;

Figure 5 is a cross-section taken on the line 5—5 of Figure 4; and

Figure 6 is an exploded view of the leg mechanism.

Referring now to the drawings, and particularly to Figure 1 thereof, the numeral 10 indicates a doll body having movably attached thereon legs 11 and 12, arms 13 and 14, and a head 15. The body 10 is hollow, as are the other members, and all of them are preferably made of a hard and durable plastic material, numerous of which are known in the art. The arms 13 and 14, and the head 15 may be attached to the body 10 by means of a partial ball and socket connection, as shown in Figure 1, wherein each arm 13 and 14 has a swiveled hook 16 imbedded therein that is urged inwardly by a strong resilient band 17

passing through the hooks 16 and a similar upper hook (not shown) imbedded in the doll head 15. The resilience of the band 17 allows the arms 13 and 14 and the head 15 to be rotated and moved angularly, but urges them strongly inwardly so that they bear firmly on the body 10 and are held by friction in any selected position. The members of the doll may be formed in any desired shape by an economical moulding operation. The preferred form is a female image, having attached hair 18 and movable eyes 19 which add to the attractiveness of the doll.

The legs 11 and 12 are pivotally connected to the body 10 to permit the doll to walk, stand erect, or sit as will hereinafter be explained. The construction of the leg joints is identical, and reference will be made only to the details of the leg 11, it being understood that leg 12 is similarly joined. As best seen in Figure 2, the body 10, has, at the hips, laterally faced sockets 25, each formed as a circular recess, dished inwardly and having a flat circular inner wall 26 which inclines outwardly and upwardly from the vertical axis of the body. The upper end of the leg member 11 is rounded and carries an inwardly facing circular flange 27 angled upwardly from the longitudinal axis of the leg 11, and adapted to extend coaxially within the socket 25 so as to lie parallel to and spaced from the wall 26.

A tubular stud or axle 28 is imbedded within the leg member 11 to project inwardly from the center of the flange 27, and a sleeve member 29 is imbedded in the wall 26 to extend outwardly within the socket 25 and journal the axle. The sleeve 29 and axle 28 pivotally connect the leg 11 to the body 10, so that when the body is held erect, the leg 11 and the similarly connected leg 12, can be moved forwardly and backwardly with respect thereto. As can best be seen in Figure 2, because of the angular position of the axle 28 as the leg 11 is moved forward or backward, it is displaced outwardly from the body 10.

The parent material of the leg 11 is thickened rearwardly of the flange 27, and the latter is formed with a counterbore 30, terminated by a flat end wall 31, from which the axle 28 extends perpendicularly. On the outer end of the axle 28 is a non-circular flanged head 32, being polygonal in the preferred form, which is molded into the parent material of the leg to hold the axle rigidly in alignment. The peripheral edge of the flanged head 32 carries a deep channel groove 33 into which the parent material of the leg 11 is forced to lock the head 32 in place. As can best be seen in Figure 6, the flat sides of the polygonal head 32 positively prevent any rotation of the head or the axle 28 relative to the leg 11. Similarly, the sleeve 29 carries an inner flanged non-circular or polygonal head 34 which is imbedded within the wall 26 during the molding of the body 10. The non-circular head 34 and a peripheral groove 35 likewise prevent any rotation or movement of the sleeve 29 relative to the body 10. The use of the locking heads 32 and 34 to hold the cooperating axle 28 and sleeve 29 rigidly positioned within the plastic members of the doll is very important, as the axle and sleeve are preferably made of metal to provide a good bearing surface, and they tend to break or wear away within the plastic material of the leg 11 and body 10 if even a slight amount of movement is permitted.

Surrounding the sleeve 29 is a helical coil spring 40 having a rear end 41 engaged in the sleeve head 34, and a forward end 42 engaged in the axle head 32. The relative angular engagement of the spring end 41 with the head 34, and the spring end 42 with the head 32, is such that when the doll leg 11 extends normally downwardly parallel to the body 10, there is neither tension nor compression on the spring 40. When the leg member 11 is pivoted forwardly, the spring 40 is placed under tension, and when the leg 11 is moved rearwardly, the spring is placed under compression. Either tension or compression, of course, causes the spring 40 to urge the leg member 11 back towards its normal position in alignment with the longitudinal axis of the body 10 much faster than it would tend to return merely under the influence of gravity.

To prevent unwinding or overwinding of the spring 40, the leg member 11 is fixed to make only a half-turn forwardly or half-turn rearwardly with respect to the body 10. At the bottom of the flange 27 is a projecting ear 43, and at the top of the wall 26 is a fixed projecting ear or stop 44 which the ear 43 meets as the leg 11 is rotated. As can best be seen in Figure 3, the ear 43 rotates upwardly in either direction until it comes to bear against the rear or front edge of the stop 44. The ear 43 and stop 44 have a substantial cross-sectional area, and are adapted to sustain a severe shock without breakage if the doll be given rough usage.

The axle 28 and the sleeve member 29 have a large contact area and are closely fitted to provide a sturdy pivot for the leg member 11. As can be understood, it is highly advantageous that the leg members 11 and 12 be locked on the body 10 so that they cannot work loose or be intentionally removed by the child. I have provided locking means in the form of a split keeper ring having an upper half 50 and a lower half 51, to connect the axle 28 and sleeve 29 and prevent any axial movement therebetween. Near the inner end of the axle 28 is a deep annular groove 52, and in the head 34 of the sleeve 29 is a shallow groove 53 adapted to register with the former when the axle and sleeve are slidably engaged.

The keeper elements 50 and 51 are seated within the groove 52 and urged outwardly by a leaf spring 54 as is best seen in Figure 6. The combined radial depth of the spring 54 and keepers 50 and 51 is less than the depth of the groove 52 so that they may be held inwardly to lie flush with the surface of the axle 28. After the axle 28 and sleeve 29 have been slidably engaged, as is best seen in Figures 4 and 5, the spring 54 urges the keepers 50 and 51 outwardly into the groove 53 which is not as deep as the groove 52 and cannot entirely contain the keeper 50, 51. Consequently, the keepers 50 and 51 remain partially within the groove 52 and provide an annular key which locks the axle 28 and sleeve 29 against axial movement. Once the keepers 50 and 51 have been urged outwardly into the groove 53, there is no way in which the leg member 11 can be removed from the body 10 since the keepers are inaccessible from the outside of the doll.

As can be understood, the entire mechanism of the leg joint is compactly positioned within the socket 25 and there are no external elements to mar the attractiveness of the doll, or in any way injure the child. Moreover, the center of gravity of the doll is very low, because the entire doll body 10 is hollow, and contains no walking mechanism.

To allow simple and rapid assembly of the axle 28 within the sleeve 29, I have provided a floating spacer or ring 55 having the same inner and outer diameter as the sleeve 29 and adapted

to ride at the outer end thereof on the axle 28. The assembly of the device can best be understood by following the steps thereof in the exploded view of Figure 6. The sleeve 29 is, of course, held rigidly within the socket 25 and the coil spring 40 is placed around the sleeve with the inner end 41 engaging the head 34. The axle 28 is likewise held rigidly on the leg member 11, and the leaf spring 54 is dropped into the groove 52 followed by the keeper members 50 and 51. In order to slidably engage the axle 28 within the sleeve 29, it is necessary to force the keepers 50 and 51 flush into the groove 52 against the urging of the spring 54, and hold them in this position until they have passed into the sleeve.

It is relatively easy to push the keepers 50 and 51 into flush engagement with the groove 52, but it is almost impossible to hold them in this position by hand, and at the same time insert the leg member 11 into the socket 25. Hence, the spacer 55 is used, being slipped over the axle 28 until it registers with the groove 52 and holds the keepers 50 and 51 therein. The hands of the operator are free to rotate the leg member 11 until the free spring end 42 is in proper position to engage with the axle head 32, and then slidably engage the axle 28 within the sleeve 29. As this is done, the spacer 55 rides to the outer end of the axle abutting the axle head 32, as shown in Figure 2.

The length of the axle 28 is longer than the combined length of the sleeve 29 and spacer 55, and the axle extends inwardly into the sleeve head 34 when the members are completely engaged. The external groove 52 registers with the internal groove 53 of the sleeve head 34 and the keeper elements 50, 51 are in a position to move into the groove 53. The keepers 50 and 51 then move outwardly under the urging of the spring 54, as previously described, to positively lock the sleeve and axle together. As can now be fully understood, the use of the floating spacer 55 greatly facilitates the assembly of the device and makes its production cost much less.

The spacer 55 also has an advantage in reducing wear on the spring 40 which would otherwise take place. When the leg 11 is rotated in a direction to tighten the spring 40, the diameter of the latter is reduced and it approaches the surface of the sleeve 29. Also, the spring 40 is cocked in the direction of rotation, and its axis inclined to the axis of the sleeve 29, causing the innermost coil to bear firmly on the sleeve and the outermost coil to bear on the spacer 55. When the leg 11 is being rotated, the inner spring end 42 remains fixed, being held by the sleeve head 34, but the outer spring end 41, being held by the axle head 32, rotates and causes the outermost coil of the spring 40 to rotate and turn the spacer 55 because of its frictional engagement therewith. If the spacer 55 were not free to rotate relative to the sleeve 29, there would be rubbing or binding of spring 40 thereon that would shorten the life of the spring. By using the floating spacer 55, the action of the spring 40 is made much freer, and the walk of the doll is consequently more lifelike. The leg 12 is connected to the body 10 by the same type of leg joint as is used on the leg 11, and it is therefore deemed unnecessary to describe its construction in detail.

To make a doll of the general class described simulate walking, it is advanced and rocked slightly from side to side, allowing the rear leg sufficient clearance to swing forwardly. The motion is well-known in the art and is used in operating many prior types of dolls. Utilizing the same motion, I have made the operation of the doll much easier to comprehend, and explain to a child. The spring 40 will always tend to return the leg 11 to its vertical position whether the leg is moved forwardly or backwardly. However, the action of the spring 40 is very free, and the leg joint 28, 29 is an excellent bearing, causing the leg member 11 to overtravel under the urging of the spring, i. e., if the leg is in a forward position, it will travel rearwardly slightly past the vertical, and if the leg is in a rearward position it will travel forwardly slightly past the vertical. When the doll is advanced gently, if the weight is shifted slightly from side to side, the rear leg will be free to swing forwardly. Continuing in an alternate sequence, the doll will appear to be walking. By disposing the axis of the leg joints 28, 29 at an angle with the horizontal, the leg 11, and similarly the leg 12, will normally be displaced laterally from beneath the doll body 10 as it swings forwardly. This may be overcome in operating the doll by pivoting the doll on the foot of the supporting leg, causing the opposite leg to swing inwardly to a position in front of the doll body instead of being laterally displaced at the side thereof.

As was previously mentioned, the pivoting or rocking motion is desirable in operating the doll to give the rear leg sufficient clearance to swing forwardly. This rocking motion, however, must be very slight, and if the operator concentrates on rocking the doll, he will tend to impart too much swaying motion to the legs and they will not advance properly. In my improved walking doll, the child need only to be told to concentrate on placing the legs of the doll generally in front of the body. To do this, he will necessarily pivot the doll on the supporting foot, and will impart the natural rocking motion from side to side as the doll is advanced. As can be understood, this advantage is not provided in conventional walking dolls wherein the legs are mounted to swing directly in front of the body, and the concentration of the child must be on rocking the body from side to side. This simplified operation causes the doll to be more desirable to a child, and is a substantial advantage in a device of this character.

The angular joints 28, 29 likewise cause the legs 11 and 12 to spread into an open triangular position when the body 10 is placed in an erect sitting position with the legs outstretched. In this position, the doll is very stable and will not fall over to either side as is customary with conventional walking dolls that may be placed in a sitting position. When the doll body 10 is standing erect with the legs 11 and 12 vertically disposed, therebeneath, the device is again unusually stable and will not normally rotate at the hips. If the body 10 is to rotate forwardly or backwardly relative to the leg members 11 and 12, the latter members must spread, and as they are in frictional engagement with the supporting surface, they tend to resist any such spreading, and hold the body 10 in an erect vertical position. Thus, the doll is stable in either a standing or sitting position, notwithstanding the fact that the legs 11 and 12 are freely mounted for the walking action.

As was previously mentioned, the doll is very mass-produced and used in a variety of different shapes and sizes of dolls without modification.

Many changes in design and construction will be apparent to those skilled in the art, and I do not wish to be restricted to the details of the preferred form shown and described herein, except as defined in the appended claims.

I claim:

1. In a walking toy of the class described, a joint connecting each of the leg members to the body member, which comprises: an axle having a flanged polygonal head with a peripheral groove therein adapted to be imbedded in one of said members to prevent relative axial or rotational movement and having an annular groove near the opposite end thereof; a cooperating tubular sleeve journaling said axle and having a flanged polygonal head with a peripheral groove therein adapted to be imbedded in the other of said members to prevent relative axial or rotational movement and having an internal annular groove near the head end thereof registering with the groove in said axle when said axle and sleeve are slidably engaged, said axle groove being deeper than said sleeve groove; a leaf spring seated in the bottom of said axle groove; ring segments seated within said axle groove and urged outwardly into partial engagement with said internal sleeve groove by said spring to prevent relative axial movement between said sleeve and said axle; a floating collar on said axle having the same internal and external diameter as said sleeve and located between said head of said axle and the free end of said sleeve; and a helical spring surrounding said sleeve and connected to said sleeve head and said axle head to urge said leg member to a predetermined position with respect to the longitudinal axis of said body when displaced in either direction therefrom.

2. A walking toy of the class described which includes: a molded body member of elongated vertical dimension; a pair of leg members on the opposite sides of said body extending downwardly therefrom for independent forward and rearward rotation; and a rotatable joint connecting each of said leg members to said body member and disposed with its axis directed outwardly and downwardly from the horizontal causing said leg members to spread apart when rotated in the same direction with respect to the longitudinal axis of the body, whereby the upper portion of said body will remain erect when said toy is standing or sitting, said rotatable joint comprising an axle having a flanged polygonal head with a peripheral groove therein adapted to be imbedded in one of said members to prevent relative axial or rotational movement, and having an annular groove near the opposite end thereof, a cooperating tubular sleeve journaling said axle and having a flanged polygonal head with a peripheral groove therein adapted to be imbedded in the other of said members to prevent relative axial or rotational movement, and having an internal annular groove near the head end thereof registering with the groove in said axle when said axle and sleeve are slidably engaged, said axle groove being deeper than said sleeve groove, a leaf spring seated in the bottom of said axle groove, ring segments seated within said axle groove and urged outwardly into partial engagement with said internal sleeve groove by said spring to prevent relative axial movement between said sleeve and said axle, a floating collar on said axle having the same internal and external diameter as said sleeve and located between said head of said axle and the free end of said sleeve, said collar being rotatable with respect to both said sleeve and said axle; and a helical spring surrounding said sleeve and connected to said sleeve head and said axle head to urge said leg member to a predetermined position with respect to the longitudinal axis of said body when displaced in either direction therefrom.

3. A walking toy of the class described which includes: a body; a leg having a normal static position, corresponding to a standing position, said body and said leg forming a pair of relatively pivotal members; a sleeve having a head nonrotatably anchored in one of said pivotal members and projecting therefrom; an axle having a head nonrotatably anchored in the other of said pivotal members and projecting therefrom, said axle being journaled in said sleeve for rotation with respect thereto about their common longitudinal axis but held against rotation about an axis perpendicular thereto, said axle and said sleeve having aligned annular grooves therein; locking means within said annular grooves holding said axle and said sleeve against axial movement with respect to each other while not restraining rotational movement therebetween; and a floating collar having the same internal and external diameter as said sleeve, mounted on said axle between the head thereof and the projecting end of said sleeve.

4. A walking toy of the class described which includes: a body; a leg having a normal static position, corresponding to a standing position, said body and said leg forming a pair of relatively pivotal members; a sleeve having a head nonrotatably anchored in one of said pivotal members and projecting therefrom; an axle having a head nonrotatably anchored in the other of said pivotal members and projecting therefrom, said axle being journaled in said sleeve for rotation with respect thereto about their common longitudinal axis but held against rotation about an axis perpendicular thereto, said axle and said sleeve having aligned annular grooves therein; locking means within said annular grooves holding said axle and said sleeve against axial movement with respect to each other while not restraining rotational movement therebetween; spring means connected to said sleeve and said axle and having a normal, unstressed position corresponding to said normal position of said leg, said spring means being stressed by the pivoting of said leg in either direction from said normal position, the strength of said spring means being such as to pivot said leg when the latter is suddenly released from a displaced position moving said leg to its normal position, and then beyond, to stress said spring in the opposite direction; and a floating collar having the same internal and external diameter as said sleeve, mounted on said axle between the head thereof and the projecting end of said sleeve.

5. A walking toy of the class described which includes: a body; a leg having a normal static position, corresponding to a standing position, said body and said leg forming a pair of relatively pivotal members; a sleeve having a head nonrotatably anchored in one of said pivotal members and projecting therefrom; an axle having a head nonrotatably anchored in the other of said pivotal members and projecting therefrom, said axle being journaled in said sleeve for rotation with respect thereto about their common longitudinal axis but held against rotation about an axis perpendicular thereto, said axle and said sleeve having aligned annular grooves therein·

locking means within said annular grooves holding said axle and said sleeve against axial movement with respect to each other while not restraining rotational movement therebetween; helical spring means surrounding said sleeve and connected to said sleeve and said axle and having a normal, unstressed position corresponding to said normal position of said leg, said spring means being stressed by the pivoting of said leg in either direction from said normal position, the strength of said spring means being such as to pivot said leg when the latter is suddenly released from a displaced position, moving said leg to its normal position and then beyond, to stress said spring in the opposite direction; and a floating collar having the same internal and external diameter as said sleeve, mounted on said axle between the head thereof and the projecting end of said sleeve.

HOWARD M. BLACK.

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