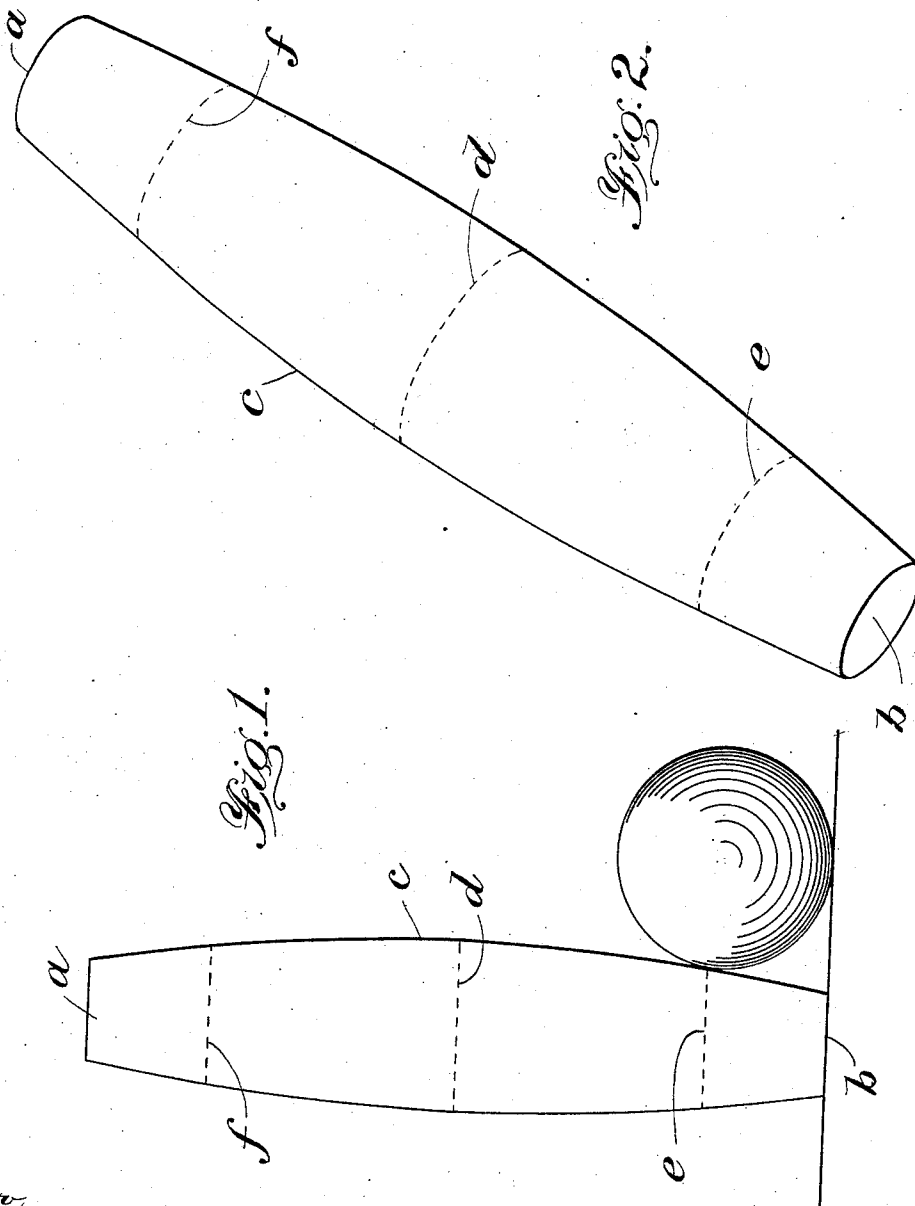


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F. M. WOOD, G. S. LITTLEFIELD & F. W. PHILBRICK.  
BOWLING PIN.

APPLICATION FILED OCT. 19, 1904.



*Witnesses:*  
H. L. Robbins -  
A. C. Ratigan

*Inventors*  
F. M. Wood.  
G. S. Littlefield.  
F. W. Philbrick.  
by Wright, Benson & Kimbly  
*Attorneys.*

# UNITED STATES PATENT OFFICE.

FREDERICK M. WOOD, OF BOSTON, AND GEORGE S. LITTLEFIELD AND FRANK W. PHILBRICK, OF WINCHESTER, MASSACHUSETTS, ASSIGNORS TO FREDERICK M. WOOD, TRUSTEE, OF BOSTON, MASSACHUSETTS.

## BOWLING-PIN.

No. 846,372.

Specification of Letters Patent.

Patented March 5, 1907.

Application filed October 19, 1904. Serial No. 229,050.

*To all whom it may concern:*

Be it known that we, FREDERICK M. WOOD, of Boston, in the county of Suffolk, and GEORGE S. LITTLEFIELD and FRANK W. PHILBRICK, both of Winchester, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Bowling-Pins, of which the following is a specification.

The present invention relates to pins used for bowling, and has for its object to provide a pin of this character having the features of advantage over similar devices previously used which are hereinafter enumerated.

The invention consists of the bowling-pin having the novel features which I will now proceed to describe and claim.

Of the accompanying drawings, Figure 1 represents a side elevation, and Fig. 2 represents a perspective view, of a bowling-pin constructed in accordance with our invention.

The same reference characters indicate the same parts in both figures.

The game of bowling or tenpins was formerly carried on with the use of large heavy pins having the general shape of a bottle and commonly known as "bottle-pins," in connection with which large and very heavy balls were required to attain the best results and make the highest scores. Such balls, however, weighing ordinarily about sixteen pounds, are too heavy for any but the strongest players to use without harmful effort, and when carried about from one place to another, as they must be by bowling teams when going to bowl away from their own alleys, (for visiting teams usually take their own balls with them,) can only be transported with considerable difficulty and cause great inconvenience and annoyance, and, in addition, such balls being made of lignum-vitæ, which is an expensive wood, and being difficult to manufacture are very expensive.

In order to avoid the necessity of using balls of such inconvenient size, thus making the mechanical part of the game easier, and also to increase the excitement and interest of the game, a pin of different character, substantially cylindrical in shape and known as the "candle-pin," has been introduced in place of the bottle-pin and has become ex-

ceedingly popular of late years, almost wholly superseding the bottle-pin. Pins of this character are much lighter and more lively than bottle-pins, so that it is possible to do considerable execution among them by using a small ball of four and one-half inches diameter, which is as large a ball as can conveniently be handled and rolled without being provided with finger-holes. These pins, however, are objectionable, for the reason that they jump and fly about so widely as to be a source of danger to the alley attendants, at least one attendant having been killed and several others injured by the flying pins, and a source of injury to the alley itself, for where they fall they strike the alley with such force as to scar and splinter it, very quickly making it unfit for use. Further, the use of these pins tends to discourage careful and accurate bowling and put a premium on haphazard play for it frequently happens that a clean well-directed ball will produce less results than a poorly-aimed and carelessly-delivered one, this by reason of the jumping tendency of the pins above referred to, which causes those pins directly in the path of the ball and squarely struck thereby to fly up and shoot clear over the standing pins without hitting them, while poor balls, striking the group of pins a glancing blow, may knock over two or three and set them rolling and twisting about among the others, where they may with luck overturn the whole set. Then, again, the upset pins are not removed, but are left lying about on the alley and constitute what is known as "dead-wood," which takes a too important part in the game as played with candle-pins, for one of these pins when lying on its side if struck by a ball will roll ahead and knock down all the pins in its path, which may be all the pins of the set, instead of spinning around and rolling or sliding off at one side, as the bottle-pins do. The dead-wood also is a source of danger, for the balls striking it are deflected and caused to leap into the air and fly about, constituting a menace to all in the neighborhood, so that in some alleys it has been made a rule to remove the pins as fast as they are knocked over; but when this is done the whole interest in the game is taken away, for without the dead-wood it is practically impossible by the exercise of any amount of skill and science to

make a fairly good score. It thus appears that bowling with candle-pins is a most uncertain as well as dangerous game when the dead-wood is allowed to remain, for it is practically impossible to tell in advance what the pins will do, so that the game becomes one of chance entirely instead of one of science and skill, and with the dead-wood removed it is still uncertain, and although not so dangerous, less interesting.

It has been our aim to produce, and by our invention we have produced, a pin in which are combined the desirable features of both the older types, while the defects of each are avoided. This pin, as seen in the drawings, has its ends or bases *a b* flat and perpendicular to its axis and its sides *c* convexedly curved or bulging. The pin is circular in cross-section and is made by turning down in a lathe a billet of wood, its greatest diameter being on the dotted line *d*, midway between its ends, and its sides tapering symmetrically on a smooth curve of revolution of a substantially circular arc to the ends, giving the pin a shape something like that of a barrel, though greatly elongated. We have found that for the attainment of the best results the greatest diameter of a pin fifteen inches in height should be about three and one-half inches, the diameter of the end two inches, and that of the zones *e* and *f*, where the pins are struck by the balls, being about two and nine-sixteenths inches from the ends when a ball of four and one-half inches diameter, which has been adopted as the regulation ball, is used about two and three-fourths inches. We do not wish to limit our invention to pins of these exact dimensions, as it may be desirable to construct those in which all the dimensions are larger or smaller; but we consider it essential that substantially the exact proportions between the diameters at the points specified, the height, and the ball be preserved, as any variation therein will prevent the attainment of the best possible, or even tolerably good results. Greater proportional thickness will make the pins too heavy and unweildy for the balls, and less will render them subject to the defects inherent in the candle-pins.

Pins constructed as described possess the same advantages over the old-style heavy bottle-pins described as existing in the candle-pins, while they are an improvement over the latter in that they do not fly and jump about, nor do they spin end for end when

struck fairly by a swift ball, as do the candle-pins. Frequently when one of the latter is so struck its base is knocked out from under it with such suddenness that before the pin has had time to fall its upper end has revolved into almost the exact position formerly occupied by the lower end and struck the alley with its sharp edge a smart blow. It is owing to these actions of the candle-pins that the alleys are injured by their use, and this source of injury is avoided with the use of our improved pin by reason of the construction, which locates a large proportion of the weight near the middle and gives the pin its central convexity, preventing the spinning and flying action and causing the pin always to fall on its bulging side. Furthermore, the protuberant shape of our pins causes them in falling to strike and knock over other pins instead of falling between the pins, whereby, as well as from the fact that they are prevented from flying over the heads of the standing pins, the scores can be made larger and the game more interesting without the necessity of leaving the dead-wood on the alleys. Thus another source of danger to the attendants and of uncertainty in the play is removed.

It will be apparent, therefore, that the use of pins of our invention has made possible the use of light balls in bowling and at the same time has made the game one of accuracy and science, in which good results are largely dependent on skill instead of chance, thus giving an opportunity for improvement to follow from the exercise of care.

We claim—

The combination with a ball or projectile of small diameter, of a pin the height of which is substantially treble the diameter of said ball, said pin being circular in cross-section and provided with flat bases or ends and bulging or curved sides tapering from the middle toward said ends, the diameter of the middle portion being nearly double the diameter of said bases or ends, the diameter of the zones where the pin is struck by said ball being slightly less than the diameter of said ball.

In testimony whereof we have affixed our signatures in presence of two witnesses.

FREDERICK M. WOOD.  
GEORGE S. LITTLEFIELD.  
FRANK W. PHILBRICK.

Witnesses:

ARTHUR H. BROWN,  
C. F. BROWN.