No. 710,774. Patented Oct. 7, 1902.

H. W. HALES.

SPOOL FOR PHOTOGRAPHIC FILMS.

(Application filed Mar. 5, 1901.)

(No Model.)

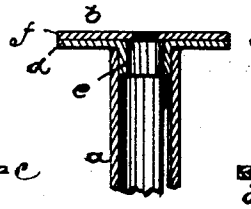

Fig. 4.

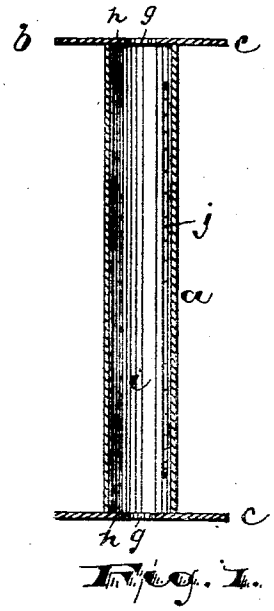

Fig. 1.

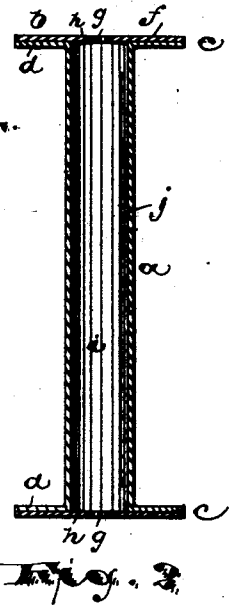

Fig. 2.

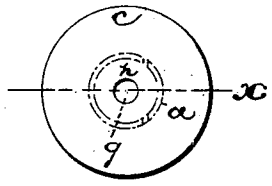

Fig. 3.

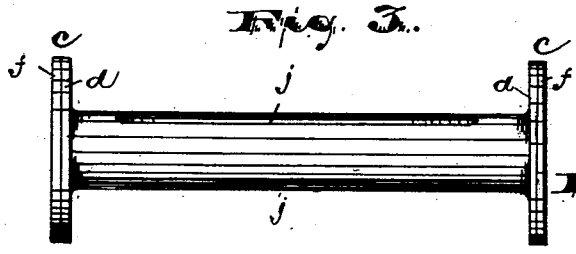

Fig. 5.

WITNESSES:

Henry King

Russell M. Everett.

INVENTOR:

Henry W. Hales.,

BY

Drake & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

HENRY W. HALES, OF RIDGEWOOD, NEW JERSEY.

SPOOL FOR PHOTOGRAPHIC FILMS.

SPECIFICATION forming part of Letters Patent No. 710,774, dated October 7, 1902.

Application filed March 5, 1901. Serial No. 49,835. (No model.)

To all whom it may concern:

Be it known that I, HENRY W. HALES, a citizen of the United States, residing at Ridgewood, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Spools for Photographic Films; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The objects of this invention are to provide a spool for rollable-film cameras that can be manufactured more cheaply than those now commonly in use, one that will be light in weight and strong to resist ordinary use, that will be rigid and true in winding and unwinding the film, and that can be used in most, if not all, of the existing forms of rollable-film cameras. In the spools now in use, constructed of hard wood with heads or flanges of metal, a cylindrical or round hole is usually bored in one end, and the other end is constructed with a cross-slot, square hole, a triangular shape of hole, or some other form of device, according to the shape of the moving power attached to the winding-key. This necessitates the use of a variety of different constructions and patterns of spools, as it is evident that a spool with a square opening at one end will not properly work in a camera which required a spool with a triangular perforation or recess, and a spool with a cross-slot cannot be used in a camera constructed to fit a spool with any other shaped opening. In prior practice it has been found necessary to make the spools of hard wood in order to be able to attach the metal heads or flanges with sufficient rigidity and avoid the heads getting loose and turning out of true, thus making them more or less heavy in weight and not in keeping with the extreme lightness of the best pocket rollable-film cameras. Furthermore, they cannot readily be adapted or changed to fit any other camera, and therefore can be used only in those they were made especially for. My invention disposes of these features and produces a spool of simple construction equally strong and less than half the weight of the wood and metal headed spools.

My invention consists of a spool made of paper, pasteboard, or other light material that, although strong and durable, can be readily cut with an ordinary pocket or pen knife.

The invention consists also in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth, and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the several figures, Figures 1 and 2 are central longitudinal sections of spools, showing variations in the construction of my improved spool. Fig. 3 is an end view of one of said spools. Fig. 4 is a central longitudinal section showing one end of another spool, and Fig. 5 is a plan of a spool of the preferred construction.

In said drawings, *a* indicates the hollow cylindrical or tubular body portion of the spool, and *b b* are the end pieces or heads, secured to the extremities of the tubular portion and forming the flanges *c c*. Said flanges are on their inner sides set at right angles to the longitudinal axis of the tubular portion, as shown in the several views, so as to lie close against the edges of the tape-like film wound on said tubular portion and guard against the entrance of light between the coils. Said heads or flanges are preferably formed each of two pieces, as shown in Fig. 4, the piece or part *d* having a tubular center part *e* projecting inwardly from one side and fitting into the bore of the tube and cemented therein, and an outside plate or disk *f*, having a central hole *g* smaller than the bore or chamber *i* of the tube, so that said disk forms at the ends of said bore an inwardly-projecting flange *h*, said disk or plate being cemented to the outer side of the piece *d*. The tubular extensions of the disks fitting within the tube, as described, not only enable the heads or flanges to be fastened to the ends of the tube with great security, but also break the joint between the parts, so that light cannot possibly enter to the edges of the rolled photographic film lying between the flanges. The edges of the roll of film are also guarded more

effectively against light by having the inside surfaces of the flanges lying at right angles to the tubular body *a* plane and unbroken, and thus devoid of recesses, cuts, or openings through which light may enter to the film, either through the flanges or along the recesses on the inside surfaces thereof. The inner flanges *h* are integral with the outward flanges, so that no openings are formed by imperfect joints in the rapid manufacture of the spool, and the said flanges are thin and easy to be cut or perforated by the supporting and motive mechanism of the camera.

The spool can also be manufactured as in Fig. 2, where the tube is provided with the pieces or part *d d*, integrally united with the tubular body. I can also obtain a practical construction by dispensing with the part *d*, the disk or plate *f* in that event being cemented directly to the end of the tube, as in Fig. 1. By either method of construction an extremely light, strong, and smooth-working spool is produced, and the heads or flanges cannot become displaced or out of true, as metal ones are apt to do. The head or flange also, while very strong and firm, is not so hard but that it may be cut with an ordinary pen or pocket knife, and thus it will be seen that the small round opening at either end of the spool may be cut or opened in a few seconds to any desired shape or size, thus adapting it to universal use in any style of camera.

The tubular body of the spool is provided with longitudinal saw cuts or slits *j*, made in any suitable manner, into which the end of the film may be inserted and sufficiently fastened preliminary to rolling or winding it upon the spool.

Having thus described the invention, what I claim as new is—

1. The improved spool for rollable-film cameras, comprising a tube and end pieces, said end pieces providing heads or outward flanges and integral extensions into the bore of the tube, the said pieces forming with the tube joints impervious to light.

2. The improved spool for rollable-film cameras, comprising a tube, having means for fastening the film preliminary to rolling the same upon the spool, end parts *d*, having at their inner sides tubular extensions *e*, fitting into the bore of the tube and outside plates applied to the end parts *d*, at the outer sides and having central holes, smaller than the bore of the tube, substantially as set forth.

3. The improved spool for rollable-film cameras, comprising a tube and end pieces, said end pieces being secured to the opposite ends of the tube and forming flanges to protect the edges of the rolled film from light and near their centers having tubular extensions which enter the first said tube and break the joints between said parts and render the spool impervious to light at said joint, substantially as set forth.

4. The improved spool for photographic films, comprising a tubular body and flanges secured to the opposite ends of said tubular body, the said flanges at both their inner and outer sides presenting surfaces formed at right angles to the axis of said tube, the inside surfaces of said flanges being plain and unbroken by recesses such as will permit access of light to the edges of the rolled film and the outer surfaces presenting unbroken extensions from the peripheries of said flanges to a point within the line of the bore or passage through said tube, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 26th day of February, 1901.

HENRY W. HALES.

Witnesses:
CHARLES H. PELL,
C. B. PITNEY.