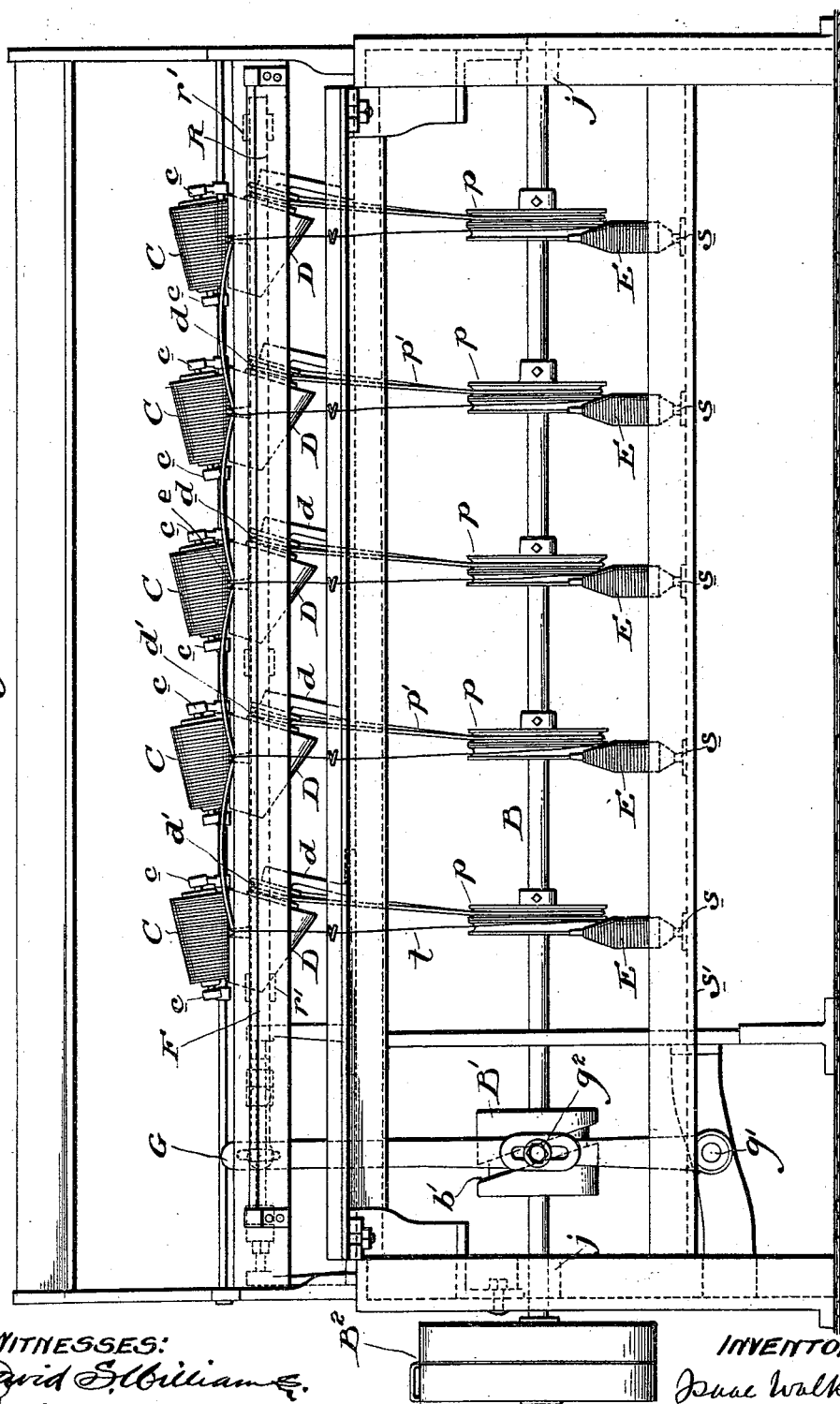


I. WALKER.
CONE WINDING MACHINE.

No. 493,049.

Patented Mar. 7, 1893.

Fig. 1.



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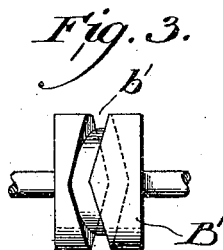
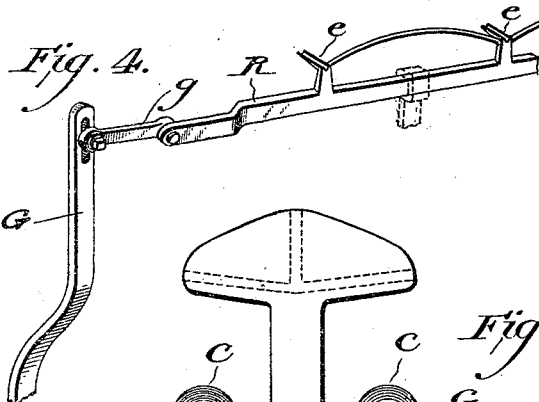
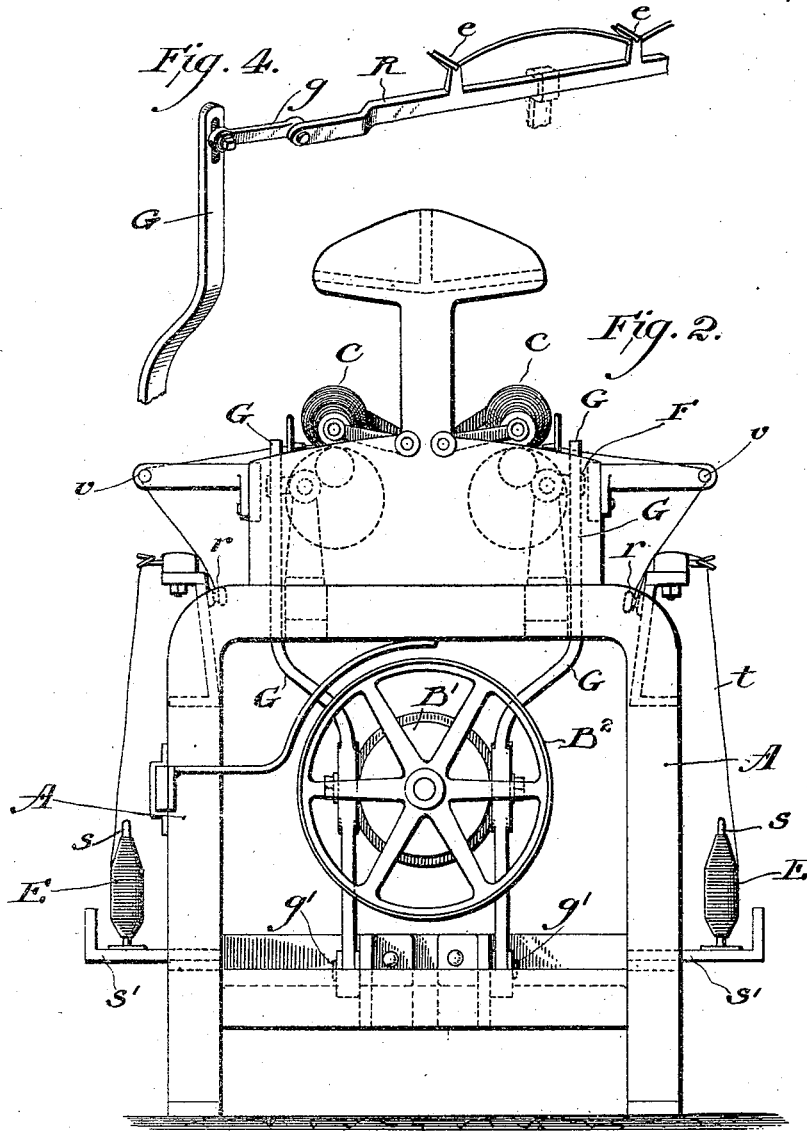
(No Model.)

2 Sheets—Sheet 2.

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WITNESSES:
David S. Williams,
J. Henderson.

INVENTOR:
Irene Walker,
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UNITED STATES PATENT OFFICE.

ISAAC WALKER, OF PHILADELPHIA, PENNSYLVANIA.

CONE-WINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 493,049, dated March 7, 1893.

Application filed April 13, 1892. Serial No. 428,963. (No model.)

To all whom it may concern:

Be it known that I, ISAAC WALKER, of the city of Philadelphia and State of Pennsylvania, have invented a certain new and useful
5 Improvement in Cone-Winding Machines; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention has relation to cone winding machines, and consists in a cone winding machine having a single cam-shaft as hereinafter particularly described.

The object of my invention is to provide an improvement in machines for winding cones of a more simplified construction than those
15 heretofore invented and now in use, and of a construction requiring less power to operate the machine in winding a given number of cones and to increase the winding facilities so that a given number of cones can be wound
20 at a greater speed than in the devices heretofore constructed and thus produce a saving of time and labor.

In the accompanying drawings:—Figure 1, is a side elevation of a cone winding machine containing my invention with two series of
25 five cones on each side for the purpose of illustration. Fig. 2 is an end view of the device. Fig. 3 is a detached side elevation of cam as provided on the main cam shaft. Fig.
30 4 is a detached perspective view of the thread guide rod attached to the cam operated up-right lever.

I will now describe the machine containing my improved device.

35 A is the main supporting frame of the machine into which the cam and pulley shaft, B, are journaled in suitable bearings, *j*, at each end of the machine, and at intermediate points if desired, where the machine is of a sufficient
40 length to require it; the shaft, B, is provided preferably at one end with a cam, B'. Band pulleys, *p*, are also provided upon the said shaft, B, at intervals by keying according to the number of cones to be operated.

45 Above each pulley, *p*, and to one side of the line of the shaft, B, two series of cone-shaped drums, D, are independently journaled in journal bearings, *d*, attached to the main frame of the machine preferably at an oblique
50 angle. Each drum, D, is provided with a pulley, *d'*, which is connected by a cord, *p'*, with the pulley, *p*, provided on the shaft, B;

the pulleys, *p*, are preferably provided with double grooves so that they may connect with and operate the respective drums provided
55 above but on different sides of the machine, as shown in Figs. 1 and 2; the winding cones, C, are mounted immediately above each respective drum, D, in loose journal bearings, *c*, so constructed as to allow the cone, C, to
60 be readily lifted out or inserted at will and to bear frictionally upon the upper face of the cone, D, so that as the cone, D, is revolved the winding cone, C, will also revolve by frictional contact therewith. The spools
65 or cops, E, from which the material is to be wound on the cones, C, are provided upon vertical spindles, *s*, secured upon a rod or bracket, *s'*, attached to the frame, A, of the machine in numbers according to the num-
70 ber of cones. One end of the thread, *t*, from the spool or cop, E, is secured to the cone, C, onto which it is to be wound passing immediately over any suitable tension device
75 such as, *r*, for keeping the thread taut while being wound and over an intermediate pulley such as *v*.

In order that the thread, *t*, may be evenly and smoothly wound upon the respective cones back and forth in layers according to
80 the length of the cone there is provided a longitudinal thread-guide-rod, R, secured in suitable bearings as *r'*, to the frame, A, to allow of a lateral motion; at one end of the rod, R, a vertical cam rod, G, is connected therewith
85 as by the link, *g*, which rod, G, is pivoted at its lower end, *g'*, to the frame, A; this rod, G, is secured in position in close proximity to the cam, B', and opposite the same and is provided with a pin or bolt, *g''*, engaging in
90 the indentation, *b'*, of the cam, B'; on the upper side of the rod, R, I provide, preferably about on a level with the upper face of the drum, D, an open eye, *e*, as a guide for the
95 thread, *t*, as it passes on to the cone, C, in the process of being wound. The cam, B', provided on the shaft, B, is so constructed that by its revolution the arm, R, carrying the eyes, *e*, will be reciprocated to and fro through the medium of the upright rod, G, at a de-
100 sired speed proportioned to the winding speed of the cones, C, driven by frictional contact with the face of the drums, D; the speed of the drums, D, being relatively regulated to

the rate of travel of the bar, R, by the respective size which the pulleys *d*, bear to the pulleys, *p*.

The machine is driven from the single centrally located shaft, B, through the medium of the belt pulleys, B². The upright rods, G, are preferably given a curvature shown in Fig. 2 to properly connect at their different bearings.

Two series of cones and drums are provided as shown in Fig. 2, one on each side of the machine and are driven from the pulleys, *p*, on the main shaft, B, as described; two cam rods G, one on each side of a single cam, B', are employed, together with the two longitudinal thread guide-rods, R, on each side. In my invention I employ a single cam only for operating both cam rods, G, which, of course, operate alternately in reverse directions.

I have described specifically the construction of a cone winding machine.

I am aware that cone-winding machines have been heretofore invented with series of cones and drums and thread guide rods operated by pulleys and two cams in which each cam is provided upon a separate shaft and I lay no claim to this construction broadly. My invention resides in the construction described of a cone-winding machine in which the cam or cams are provided upon a single shaft having the cam levers disposed on opposite sides of the cam or cams for operating the different reciprocating thread guide rods.

I have shown in the drawings two series of five cones each to illustrate the device; the machines are preferably constructed of much greater length than illustrated in the drawings with preferably about forty or fifty cones on each side each operated as described in this specification.

The machine may be constructed to operate any desired number of cones.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a cone winding machine a main frame, a single combined cam and pulley shaft properly longitudinally journaled in said frame, cam and pulleys secured to said shaft, two series of cones and drums provided in the proper part of said frame on either side thereof, said cones and drums being independently journaled to said frame, longitudinal thread guide rod for each series of cones, said thread guide rods adapted to reciprocate horizontally in suitable bearings attached to the machine, upright cam rods pivotally secured at the lower end to the frame of the machine one for each thread guide rod and linked or jointed at the upper end to said horizontal thread guide rod, said cam rods connected with and operated by said cam provided on the main shaft of the machine, eyes or guides provided upon said thread guide rod for the passage of the thread, thread supporting devices and

means for connecting and operating the various parts substantially as described.

2. In a cone winding machine a main frame, a main central cam shaft, cam or cams provided thereon for operating thread guide rods said thread guide rods mounted in suitable bearings longitudinally and a connecting cam rod on each side of the machine pivoted at its lower end and operated by the said cam provided on the main shaft to reciprocate said thread guide rods, two or more series of drums and cones independently journaled to the frame of the machine, each cone being mounted above its respective drum and frictionally operated thereby, each of said drums provided with a pulley, pulleys provided on the main shaft for operating said drums, thread supports and guides and means for actuating the device, substantially as described.

3. In a cone winding machine provided with two or more series of winding cones a single centrally located longitudinal cam shaft journaled in the frame of the machine and pulleys provided thereon in numbers according to the number of cones; a circumferentially grooved cam provided upon said main cam shaft, upright cam rods pivoted to the frame of the machine, one on each side connected with and operated by said cams horizontally disposed reciprocating thread-guide-rods mounted in the frame of the machine and attached to said upright cam rod and operated thereby, guides provided upon said thread-guide-rod and supports and tension device for regulating the feed of the thread, frictional drums journaled to the frame of the machine beneath each respective cone for frictionally operating the same and pulleys provided upon said drums for connecting with the pulleys upon the main shaft, and bearings and mechanism substantially as described.

4. In a cone winding machine having two series of cones, a centrally disposed longitudinal main cam shaft said shaft carrying the cam, the main driving pulleys and the cone-actuating pulleys, horizontal reciprocating thread-guide-rods provided in bearings in the frame of the machine one for each series of cones, upright cam-rods pivoted to the frame of the machine connected with one of said thread-guide-rods and operated by the cam provided upon the main shaft, thread supports and guides, substantially as described.

5. In a cone winding machine a frame, A, centrally located, longitudinal cam shaft, B, journaled in said frame, said shaft provided with the cam, B', two series of winding cones and drums independently journaled to said frame, pulleys, *p*, provided upon said main cam shaft one to each drum of each series for operating the same through the medium of cords or belts, horizontally disposed reciprocating thread-guide-rod, R, one to each series of cones, upright cam rod, G, linked or pivoted to said horizontal rod, R, and pivoted at

its lower end to the frame of the machine, said cam, B', provided on said shaft, B, engaging with the pivoted upright cam rod, G, for reciprocating the rod, R, thread guides provided upon the rod, R, tension device and thread supports, and means for operating the machine, substantially as described.

6. In a cone winding machine, frame, A, centrally journaled cam shaft, B, two series of cones, C, and drums, D, each independently journaled to the said frame, said cones, C, frictionally adjusted upon and operated by said drums, D, pulleys, *p*, provided upon the main cam shaft, B, pulleys, *d*, provided on each drum, D, horizontally disposed reciprocating thread-guide-rod, R, provided in bearings to the frame, upright cam rod, G, connecting therewith and pivoted to the frame of the machine at its lower end, cam, B, irregularly grooved upon its outer circumference and provided upon the main shaft, B, connected with and operating the upright cam-shaft, G, for reciprocating the thread

guide rod, R, thread guides provided upon and carried by the rod, R, one to each cone for guiding the thread thereon, vertical spindles, *s*, for supporting the thread spools or cops, E, and pulleys and bearings for regulating the tension of the feed of the thread to the cones and mechanism for operating the device substantially as described.

7. In combination with a cone winding machine its actuating mechanism and operative parts, a double acting cam provided on the shaft with the driving pulleys, said cam constructed to operate two upright cam rods pivoted to the frame of the machine at one end and connected at the other end each respectively with a thread guide rod in the manner and for the purpose substantially as set forth.

In witness whereof I have hereunto set my hand this 12th day of April, A. D. 1892.

ISAAC WALKER.

Witnesses:

HORACE PETTIT,

H. GORDON McCONOL.