

(No Model.)

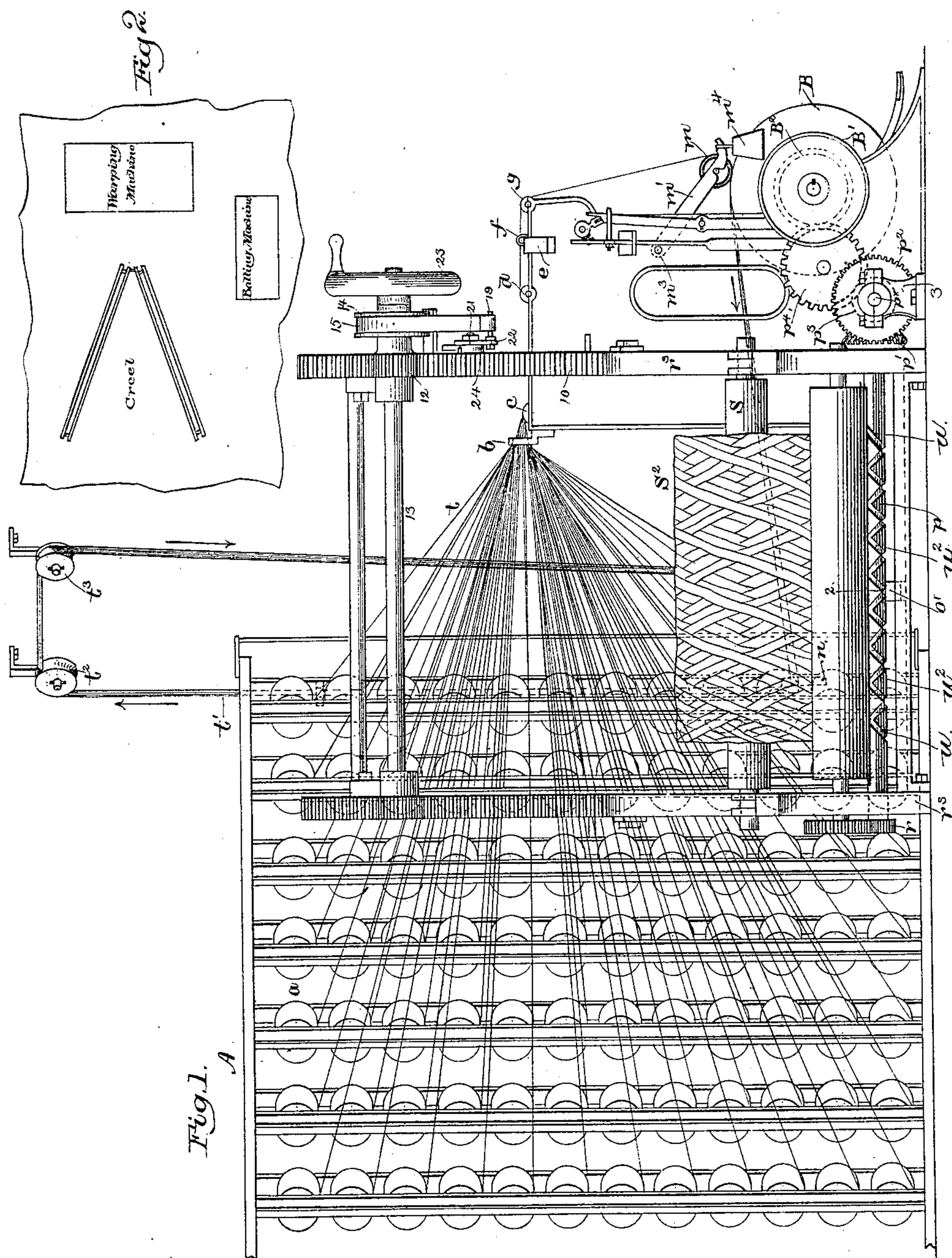
2 Sheets—Sheet 1.

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WINDING OR BALLING MACHINE.

No. 379,616.

Patented Mar. 20, 1888.



Witnesses.

Howard F. Eaton.

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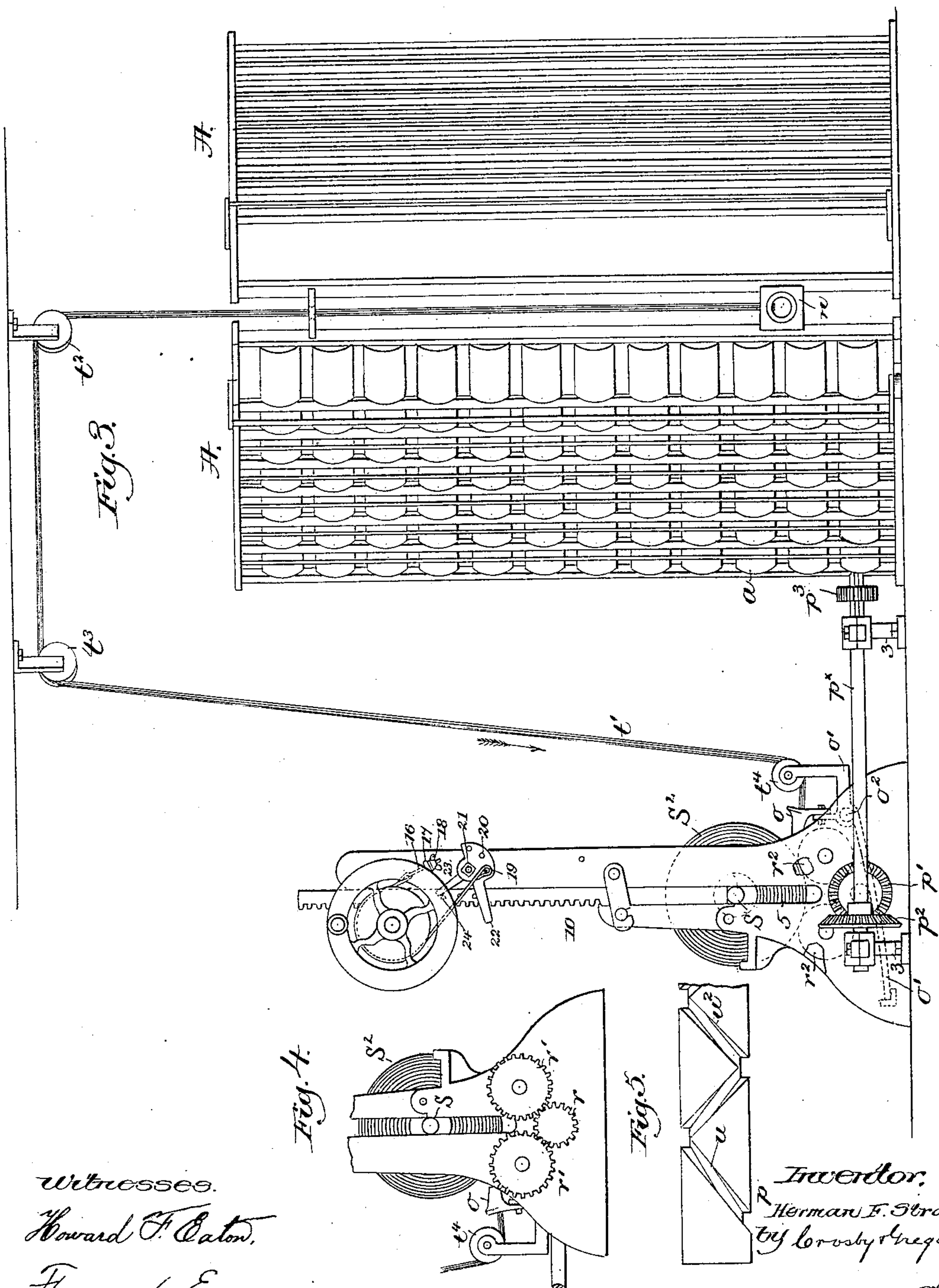
Inventor.

Herman F. Straw.
by Crosby & Gregory,
attys.

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UNITED STATES PATENT OFFICE.

HERMAN F. STRAW, OF MANCHESTER, NEW HAMPSHIRE.

WINDING OR BALLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 379,616, dated March 20, 1888.

Application filed May 13, 1887. Serial No. 238,110. (No model.)

To all whom it may concern:

Be it known that I, HERMAN F. STRAW, of Manchester, county of Hillsborough, and State of New Hampshire, have invented an Improvement in Winding or Balling Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention, applicable to that class of winding or balling machines wherein a number of yarns or threads taken from spools or bobbins are gathered together and wound spirally upon a beam for subsequent processes, has for
15 its object to prevent the winding of the material in such manner as to make the mass or ball of yarn of greatest diameter at its ends. For the best results the mass of yarn on the beam must be of uniform diameter from end
20 to end of the ball.

In my invention yarns taken from spools or bobbins mounted in a creel-frame, and led through usual raddles over usual rolls and under a bearing-roller resting upon the cylinder
25 of an ordinary warping-machine, are led back through a yarn-collecting eye at the apex of the creel-frame, where the yarns are made into a chain or rope, and from thence the mass of yarn is led over suitable sheaves into and
30 through a traveling guide-eye actuated by a traverse-screw, which effects the laying of the rope of yarn helically from end to end of the beam or ball.

In all double or crossing screw-shafts known
35 to me for reciprocating a carriage or other device the screw-thread has been made of uniform pitch from end to end, and as a result the maximum speed of the carriage or device moved by the screw is reduced as the direction
40 of movement of the carriage or device actuated by the screw is reversed, and in a winding or balling machine the yarn accumulates more at the ends of the ball than at its center.

Figure 1, in elevation, represents a creel-frame, a warping-machine, and a ball-winding
45 mechanism combined in accordance with my invention; Fig. 2, a diagram showing on a smaller scale the arrangement of the creel-frame, warping-machine, and winding mechanism shown in Fig. 1; Fig. 3, a view of Fig.

1 viewing it from the right, the warping-machine being omitted; Fig. 4, a detail of the winding mechanism; and Fig. 5 a view of one end of the traverse-shaft having the double or crossing screw-thread.

The creel-frame A, a >-shaped frame carrying the spools *a*, of any desired number, the warping-machine containing as elements a raddle or reed, *b*, guide-rolls *c d*, expansion comb-box *e*, drop-wires *f*, leading-roll *g*, winding-drum B, the shaft of which is provided with a belt-pulley, as *B'*, behind which is a gear, *B''*, (shown by dotted lines, Fig. 1,) are and may be all as usual, so need not be herein described.

The yarn or thread *t*, taken from the spools
55 or bobbins *a*, and led through the raddle over and under usual rolls of the warping-machine of usual construction, are led under a bearing-roller, *m*, the journals of which are acted upon by levers *m'*, pivoted at *m''*, the levers being
60 acted upon by weights *m'''*. Instead of winding the yarn or thread upon the roll *m*, it is led directly between the said roll and the cylinder B, the two rolls *m* and B acting as a feed for the yarn. After passing between the roll *m*
65 and the winding-cylinder B the sheet of yarn or thread is led through a gathering-eye, *n*, arranged between the warping-machine and the creel-frame, and preferably at the apex of the creel-frame, as shown by full lines, Fig. 3,
70 and by dotted lines, Fig. 1.

The warping-machine herein shown is substantially that shown in United States Patent No. 266,331, dated October 24, 1882, and instead of it I might employ any other usual or
75 well-known warping-machine. The winding-cylinder and bearing-roll constitute a feeding mechanism for the sheet of warp. The gathering-eye forms the yarns or threads into a rope or chain, *t'*, which is led over suitable
80 sheaves, *t'' t''' t''''*, and thence into and through the delivery-eye *o* of a carriage block or hub, *o'*, arranged to slide backward and forward longitudinally on a rod or bar, *o''*, the said carriage block or hub having a stud or pin, *2*,
85 (see Fig. 1,) which enters the space of the threaded screw or traverse-shaft *p*, having attached to it a bevel-gear, *p'*, engaged and driven by a bevel-gear, *p''*, on a shaft, *p'''*, mounted in stands 3 3, the said shaft at its
90 100

opposite end having a pinion, p^3 , (shown in full lines, Fig. 3, and dotted lines, Fig. 1,) the said pinion being engaged by an intermediate, p^4 , in engagement with the toothed gear B^2 , (shown by dotted lines, Fig. 1,) and fast on the shaft carrying the belt-wheel B' .

The threads at each extremity of the screw p are longer or less abrupt than at any other point, so that as the pin 2 arrives at the end of its traverse the carriage is given a quicker movement to quickly wind back the rope or chain, thus avoiding undue accumulation of the rope or chain at the ends of the ball, which fault exists in all balling-machines known to me having a traverse-shaft provided with a screw of uniform pitch from end to end.

Fig. 5, on a larger scale, shows one end of the traverse-shaft, and it will be seen that the pitch of the thread u is longer than that of the thread u^2 .

The screw-shaft p at its rear end is provided with a pinion, r , (see Figs. 1 and 4,) which engages like toothed gears, r' , on the journals of two cylinders, r^2 , mounted in the standards r^3 of the balling-machine frame, the said standards being slotted, as at 5, Fig. 3, to receive the journals or ends 6 of the roll, cylinder, or spool S , upon which is wound the rope or chain of yarn to form a ball, S^2 , the roll and yarn lying upon and being rotated by the cylinders r^2 .

The journals 6 of the roll S within the slots 5 have resting upon them rack-bars 10, which engage pinions 12 on a cross-shaft, 13, provided near one end with a friction-drum, 14, over which is extended a friction-band, 15, one end of the band having fixed to it a screw, 16, extended through an ear, 17, where the screw has applied to it a nut, 18. The opposite end of the band 15 is attached by a pin, 19, to a

locking-lever, 20, pivoted at 21, and having a handle, 22, and a shipping-arm, 23. The rack has a series of holes, in one of which may be adjusted the pin 24, so that the latter, as the bar 10 is lifted by the ball as it increases in diameter, will strike the arm 23 sooner or later, turn the lever 20, and effect the release of the tension of the band 15 on the friction wheel or pulley 14.

The handle 22 is normally held in position by being depressed until the pin 19 is directly behind the pivot 21, both being in line with the lower portion of the friction-band 15. Fig. 3 shows the lever 22 moved from its normal position by contact of the pin 24 with the shipping-arm 23.

I claim—

1. The combination, with a carriage block or hub to be reciprocated, of a traverse-shaft having a double or crossing thread the pitch of which is longer at its ends than at the middle of its length to insure a quick reversal of the movement of the carriage block or hub moved by the traverse-shaft, substantially as described.

2. The cylinders r^2 , means to rotate them, and the traverse-shaft having double or crossing threads of steepest pitch at its ends, combined with a carriage block or hub actuated by the said traverse-shaft, and a delivery-eye mounted on the said carriage block or hub, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HERMAN F. STRAW.

Witnesses:

G. W. GREGORY,
C. M. CONE.