

(No Model.)

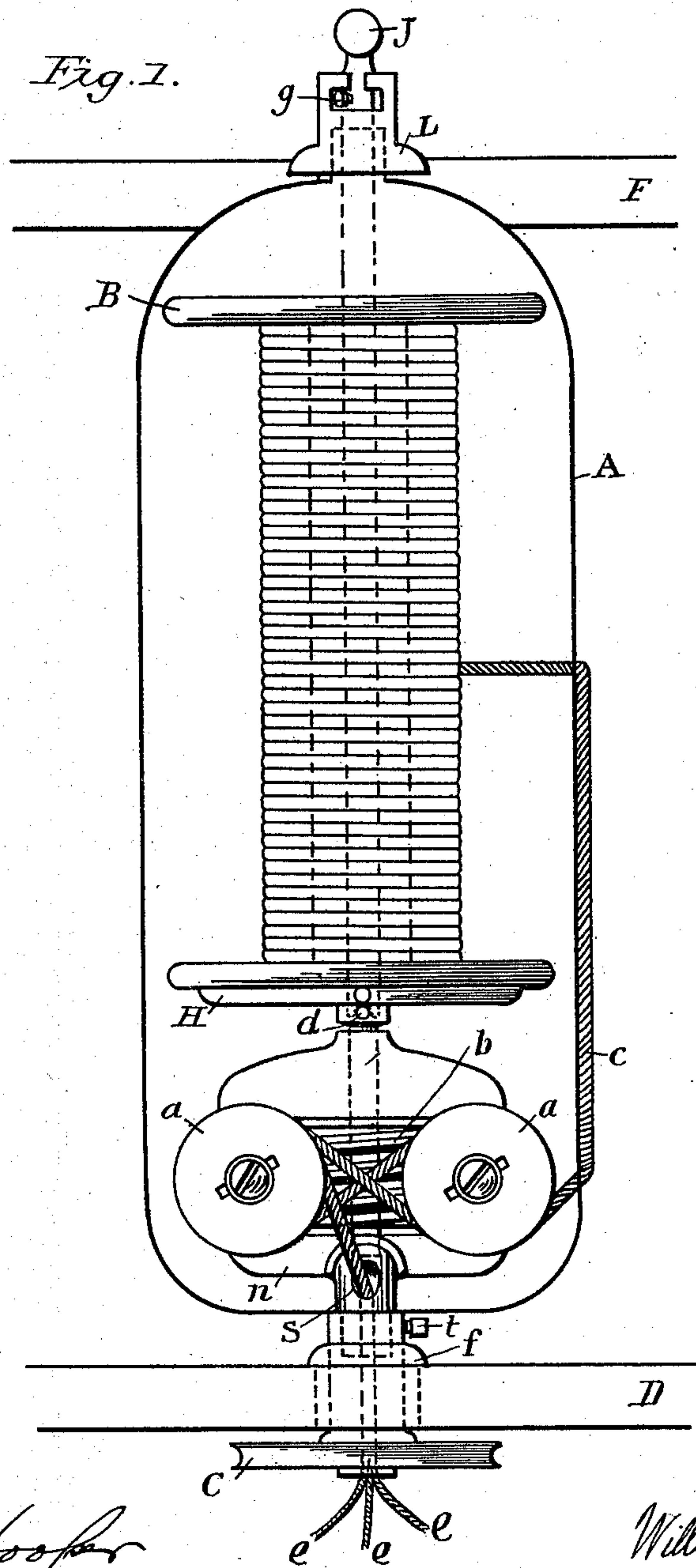
2 Sheets—Sheet 1.

W. HOLLINGSWORTH.

CAPSTAN HEAD FEED MOTION FOR ROPE OR TWINE MACHINES.

No. 412,708.

Patented Oct. 8, 1889.



WITNESSES:

James I. Hooper
Edward L. Wilson

INVENTOR

William Hollingsworth

(No Model.)

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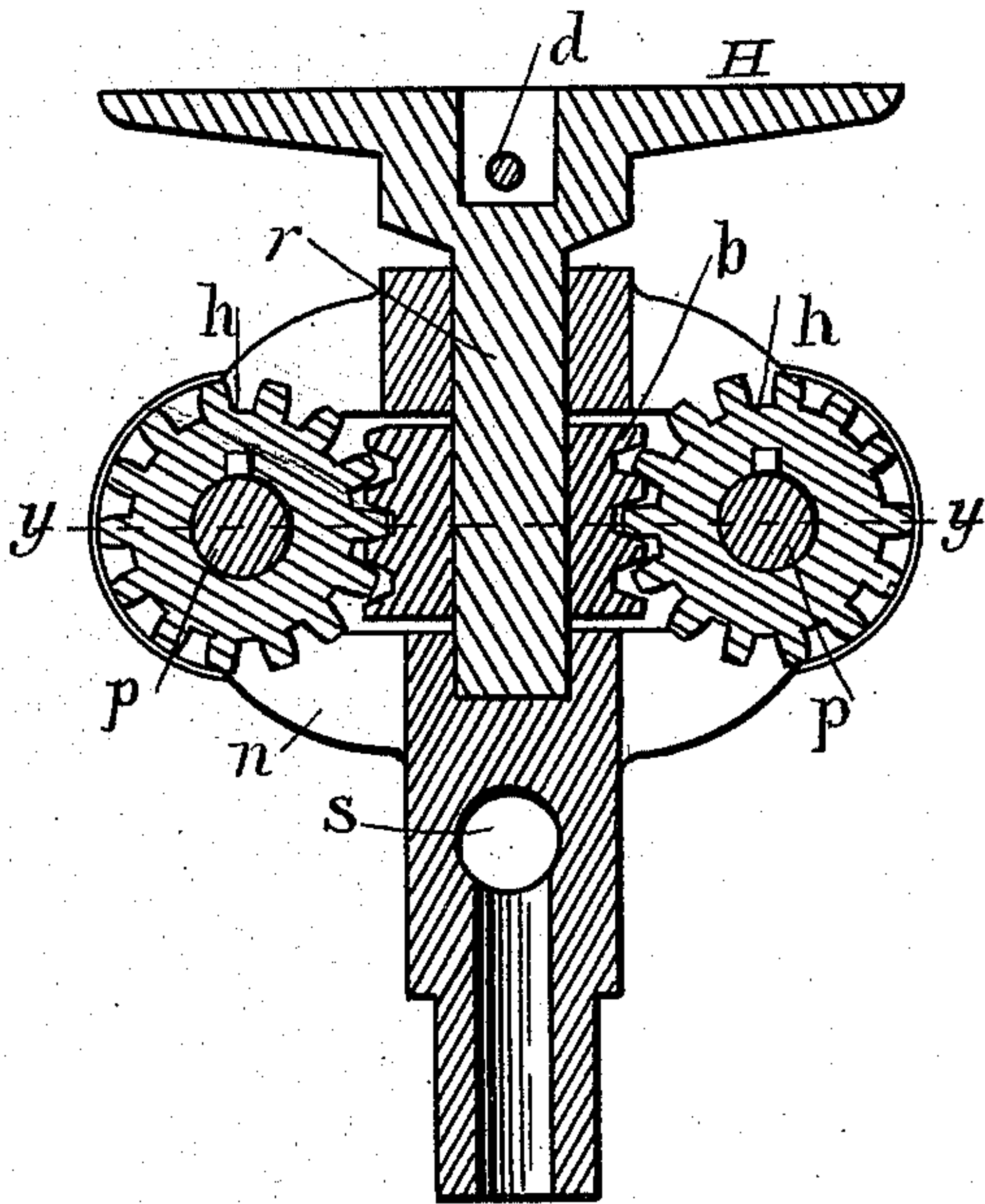


Fig. 2.

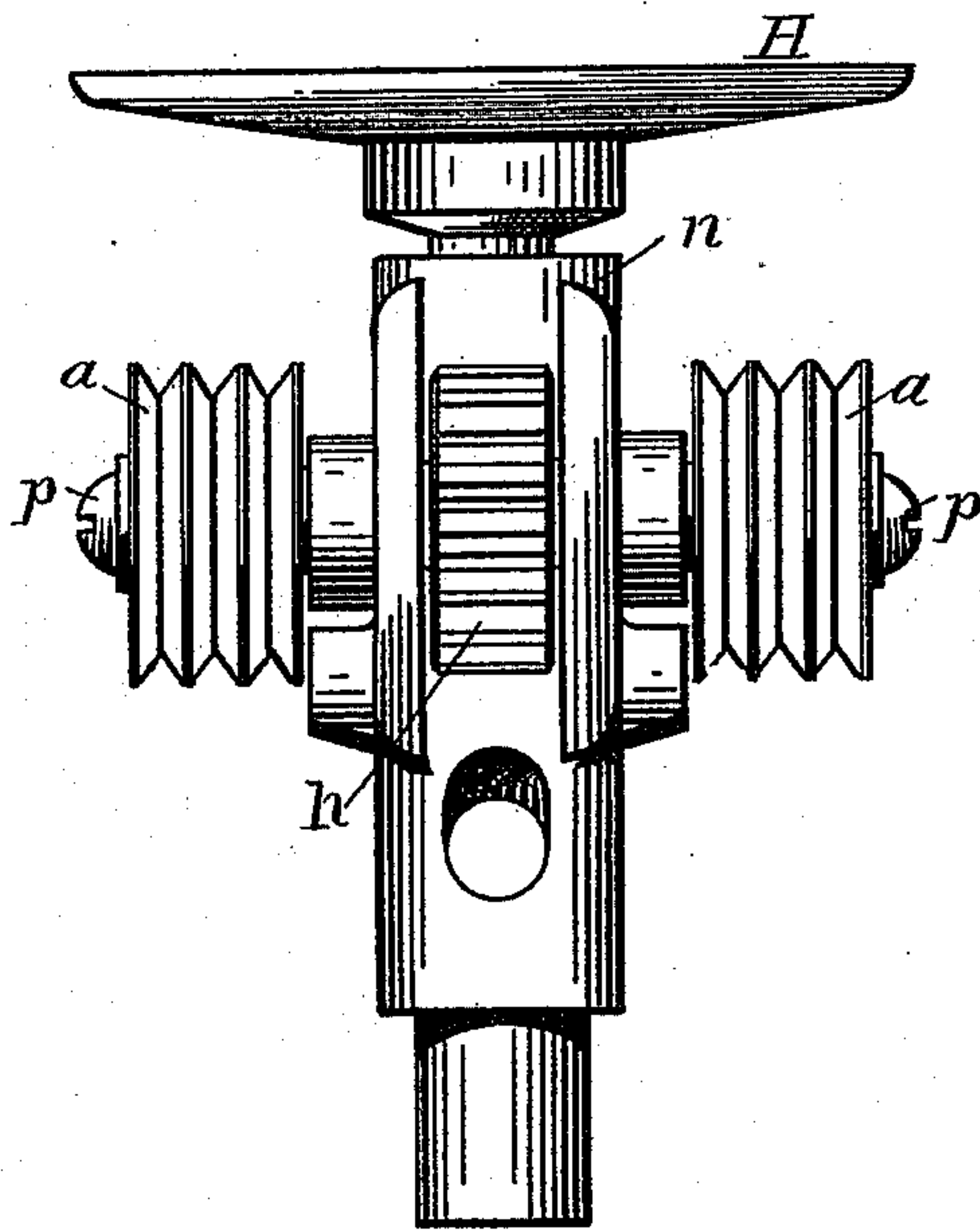


Fig. 3.

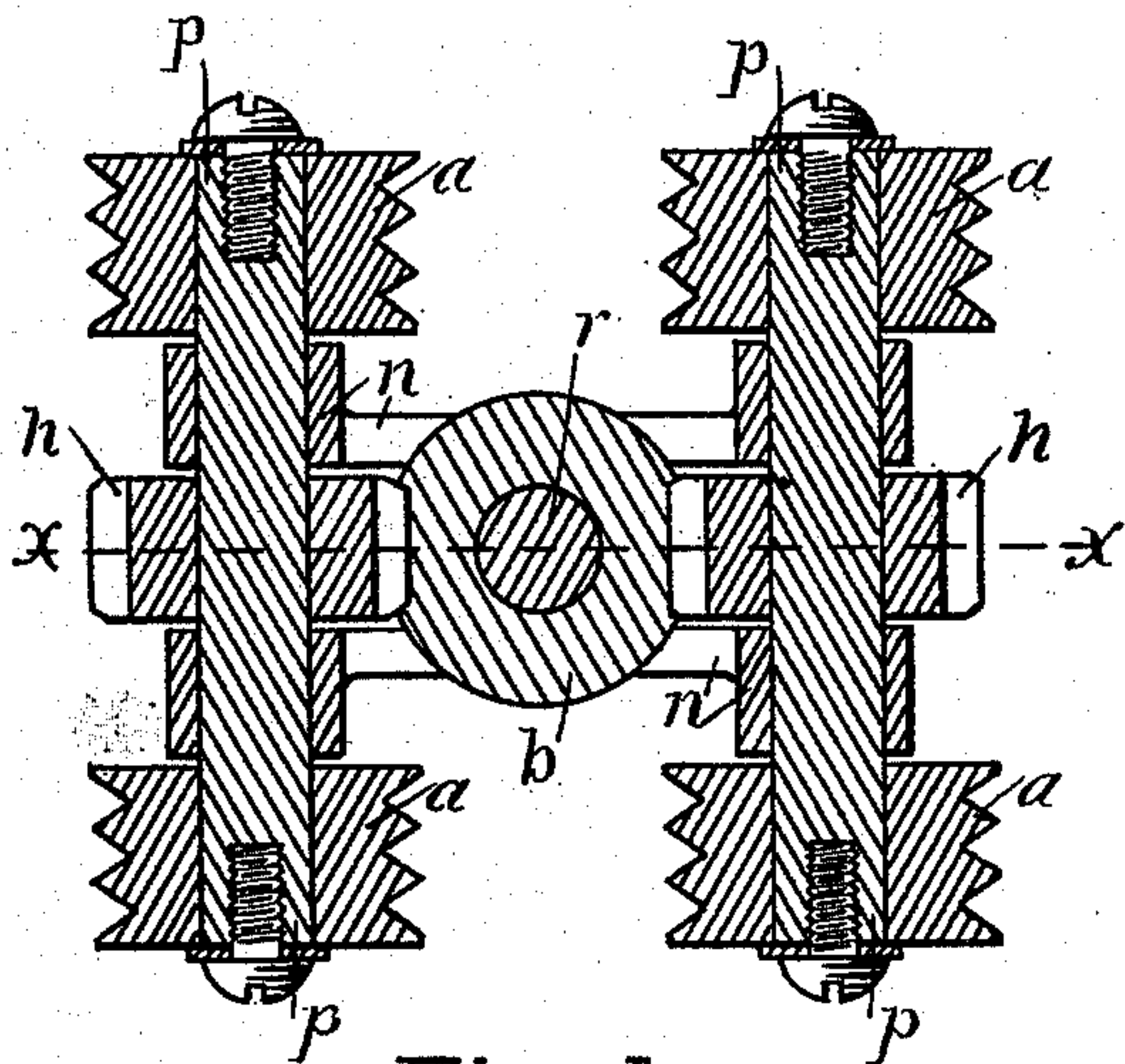


Fig. 4.

WITNESSES:

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WILLIAM HOLLINGSWORTH, OF BALTIMORE, MARYLAND, ASSIGNOR TO
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CAPSTAN-HEAD FEED-MOTION FOR ROPE OR TWINE MACHINES.

SPECIFICATION forming part of Letters Patent No. 412,708, dated October 8, 1889.

Application filed June 26, 1889. Serial No. 315,671. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HOLLINGSWORTH, of Baltimore, in the State of Maryland, have invented certain new and useful
5 Improvements in Capstan-Head Feed-Motions for Rope or Twine Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and
10 to the letters of reference marked thereon, which form a part of this specification.

This invention relates more especially to the feed or draft mechanism employed in machines used for laying up twines or ropes,
15 though it is applicable to machinery for other purposes.

Its construction and application in this specification are explained as an improvement on the invention shown in United States
20 Letters Patent No. 364,371, to E. W. Price, June 7, 1887.

In the drawings, Figure 1 shows an elevation of the capstan-head in connection with a flier and its supporting devices. Fig. 2
25 shows a vertical section of the head, taken through its center in the line $x x$, Fig. 4. Fig. 3 is an elevation of the head, taken from one side of Fig. 1. Fig. 4 shows a horizontal section taken on the line $y y$ in Fig. 2.

It is thought that the mechanism would be more readily understood if the construction of the capstan-head proper were first explained, and then its position and connection with the other mechanism set forth. The
35 frame n of the head supports the moving mechanism. It has two wings or flanges extending from two opposite sides, in each pair of which a horizontal shaft p is fitted to turn freely. To these shafts are secured two
40 worm gear-wheels $h h$, one wheel on the middle of each shaft, so that they come between each pair of wings. (See Fig. 4.) Small pulleys $a a$, having one or more grooves in their peripheries, are made fast, one on each end
45 of the two shafts p , so that all the pulleys and gear-wheels on these shafts turn with them. A short vertical shaft r is fitted to turn freely in the center of the frame n , with a circular plate H firmly secured to its upper
50 end, and a worm-wheel b is fastened to

the same shaft near its lower end in a recess made through the center of the frame n . The shaft r has a bearing in the frame above the worm-wheel, and also below it. The screw-thread on the worm-wheel b is fitted to
55 engage with the teeth of the worm-gears $h h$, so that when the frame n is held still and the shaft r , with the plate H and worm-wheel b , are turned, or the plate and worm are held still and the frame n and wheels revolve, a
60 rotary motion in a vertical plane is given to the grooved pulleys $a a$. This latter position—the shaft r with its plate and worm-gear standing still—is the one adopted in this case. This mechanism, constituting the capstan-
65 head, is placed in the lower end of the flier A , (see Fig. 1,) to which it is made fast by having a portion of its lower end inserted in a recess in the flier, where it is held by the set-screw t . The flier A has a support at
70 both its upper and lower ends. The upper end extends up into a recess in the plate L , which is firmly bolted to the top rail F , and its lower end is carried down through a bolster f , held in the middle rail D . A grooved
75 pulley C is attached to the lower end of the flier that extends below the bolster, by means of which a rotary motion is given to the flier in the usual way. A movable rod J is fitted to slide freely through a hole in the plate L
80 and top of the flier, but is prevented from turning by a pin g , inserted in the rod and held in a slot in the plate L . This slot is extended in a horizontal direction on each side, that the pin g may turn under and the rod
85 be prevented from rising while the machine is running. The rod J is extended down through the center of the flier to hold the spool B , and its lower end enters a recess in the plate H . The lower end of the rod J is
90 made forked, so that when it enters the recess in the plate it will straddle a pin d , (see Fig. 2,) passing through the hub and recess in the plate H . In this way the rod J , being held from turning by the pin g in its upper
95 end, will hold the plate H and its shaft r and worm-wheel b still by means of the pin d , while the flier and frame n , with its pulleys and gear-wheels, will be revolved around them
100 by means of the pulley C . This, as before

explained, will, by means of the central worm-wheel *b* and worm-gears *h*, give a vertical rotary motion to the grooved pulleys *a a*. The way in which this feeds or draws the twine 5 from the strand-spools and feeds it to the upper twine-spool B is as follows: The strands *e e e* are supposed in Fig. 1 to come from spools set below, as shown in the patent before referred to. These strands are conducted 10 through the opening in the lower end of the flier A and frame *n* and out through a side opening *s* in the frame, up around one of the grooved pulleys *a*, and over the other pulley on the same side of the frame *n*, and may pass 15 back and forward around these two pulleys as many times as is required to produce sufficient friction between the twine and pulleys to draw it off of the spools below. From these pulleys the twine passes out through an opening 20 in the flier, up on its outside, and then in through opening to the spool B, which stands on the stationary plate H. The friction between the plate and spool will cause the latter to drag as it is carried around by the 25 twine and take up what twine the capstan-head draws from the spools below.

The speed of the feed, and consequently the number of twists per inch in the twine, are governed by the size of the pulleys *a a*, 30 which are so arranged that they may be readily taken off and others of a different size substituted for them. It will be readily seen that one pulley alone would feed the

twine; but it is difficult to carry the twine around a single pulley a sufficient number of 35 times to obtain the friction necessary to draw it off of the strand-spools. For that reason I prefer to use two pulleys to do the drawing of the twine, and by putting two pairs of pulleys on the head of different sizes I have two 40 degrees of feed and twist always ready for use, and the head is thereby so nearly balanced that a very high rate of speed for such machines (over two thousand one hundred turns per minute) is attainable. 45

A reel similar to that shown in the patent above referred to may be substituted for the spool B, if desired.

Having thus described my improved capstan-head feed, what I claim as my invention 50 is—

A feed-head for twine and rope machines, consisting of a frame carrying a central vertical shaft having a worm-wheel fastened thereon, and one or more horizontal shafts 55 having bearings in said frame and having one or more feed-pulleys and a worm-gear wheel secured thereon, the worm-gear engaging with the central worm-wheel and being moved thereby, substantially as and for the 60 purpose set forth.

WILLIAM HOLLINGSWORTH.

Witnesses:

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