(No Model.)

4 Sheets—Sheet 1.

J. ECCLES.

MACHINE FOR COILING WARPS.

No. 349,148. Patented Sept. 14, 1886.

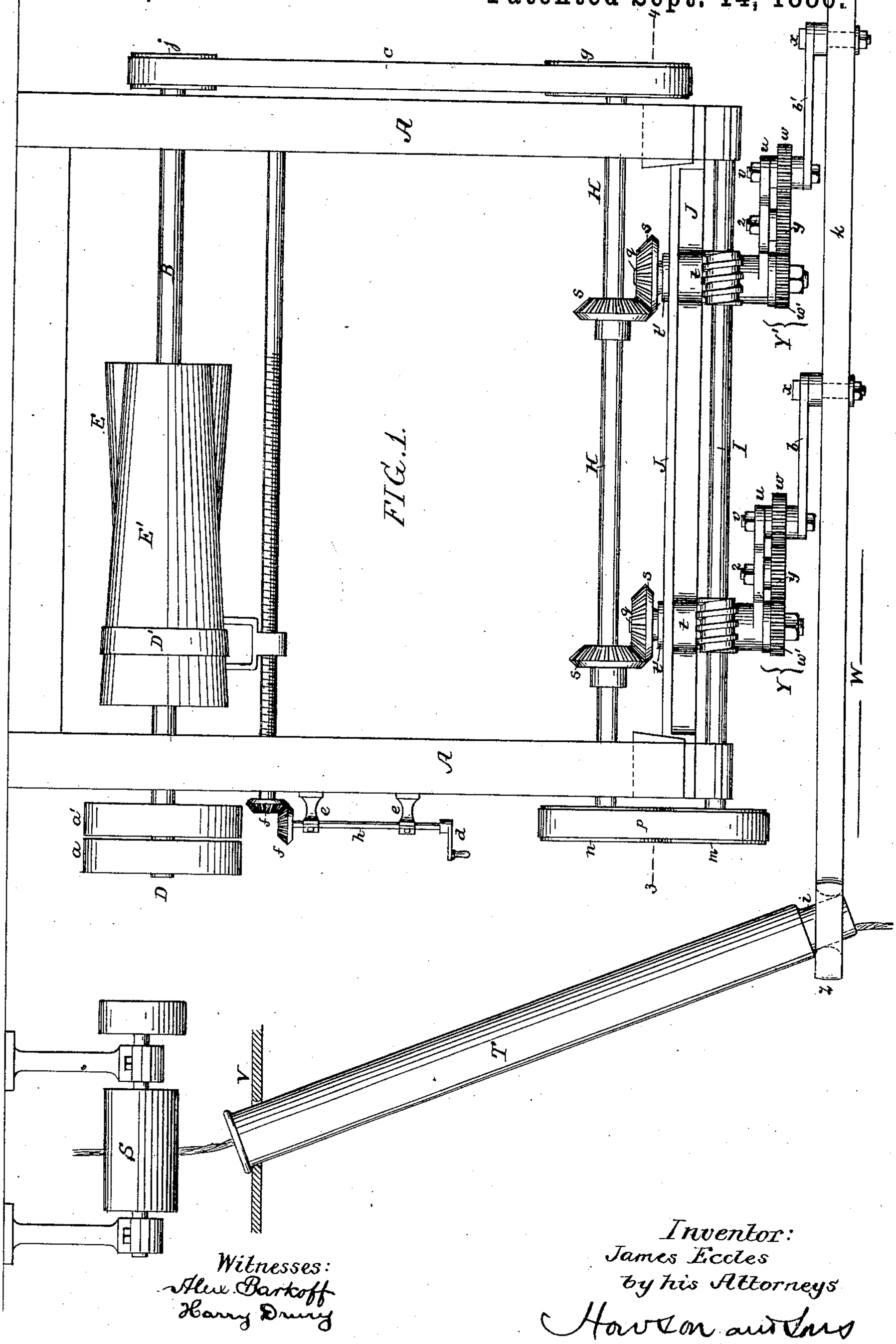

FIG. 1.

Witnesses:
Alex. Barkoff
Harry Drury

Inventor:
James Eccles
by his Attorneys
Howson and Sons

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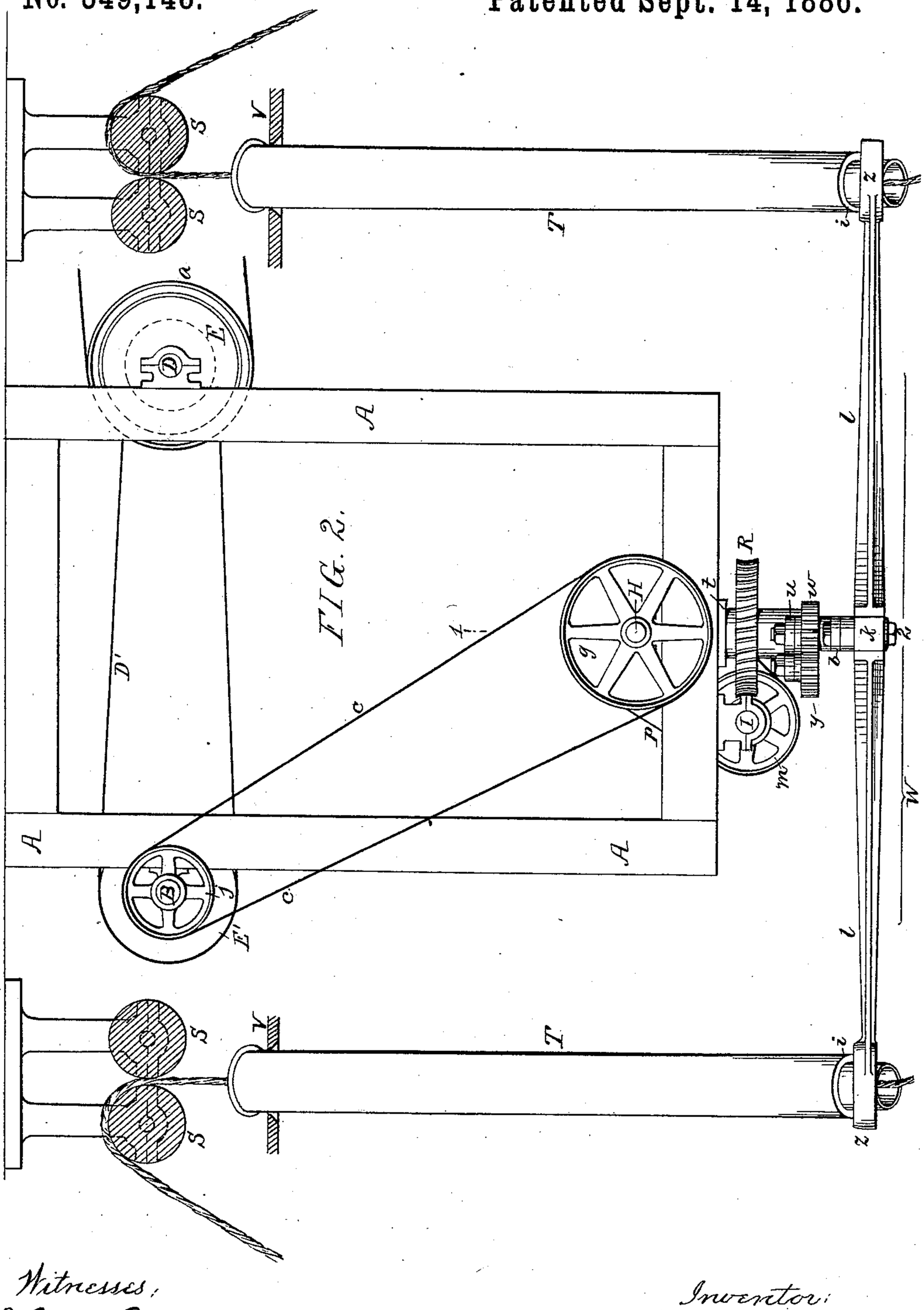

FIG. 2.

Witnesses:
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Hubert Howson

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J. ECCLES.

MACHINE FOR COILING WARPS.

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FIG. 4.

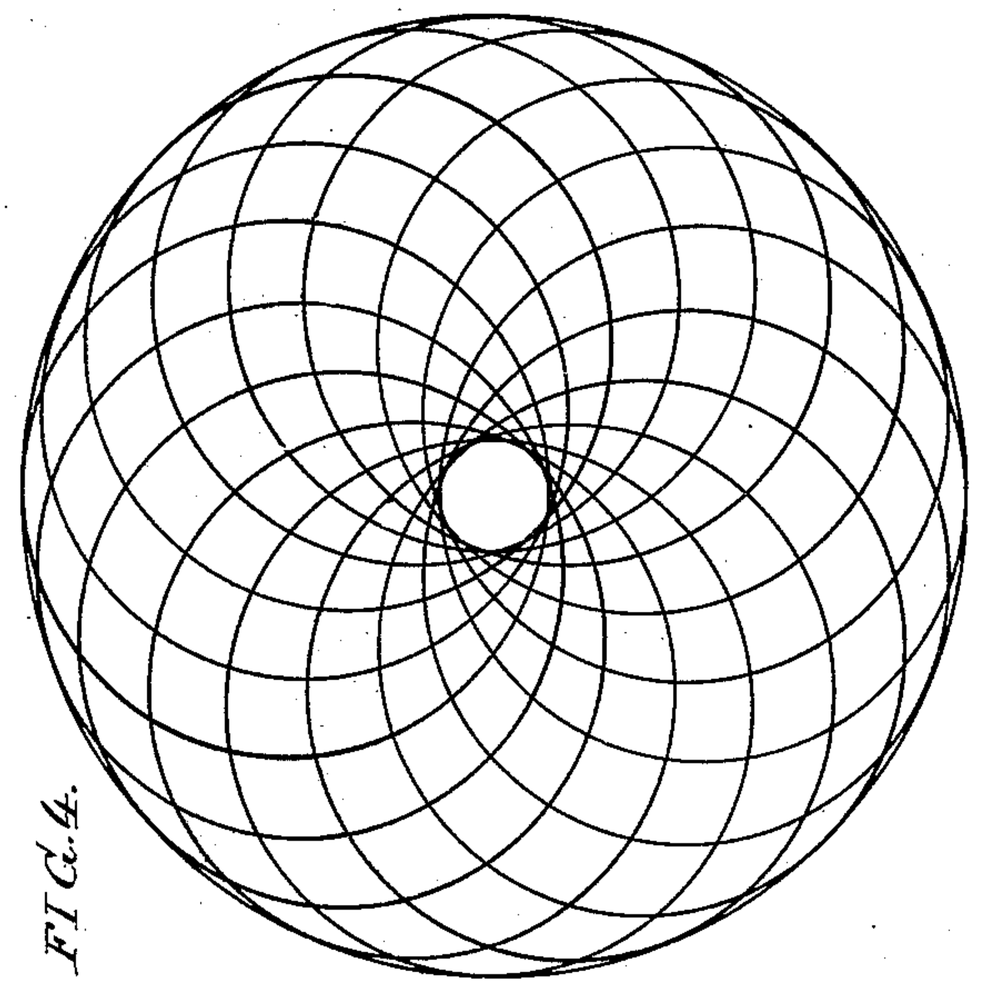


FIG. 5

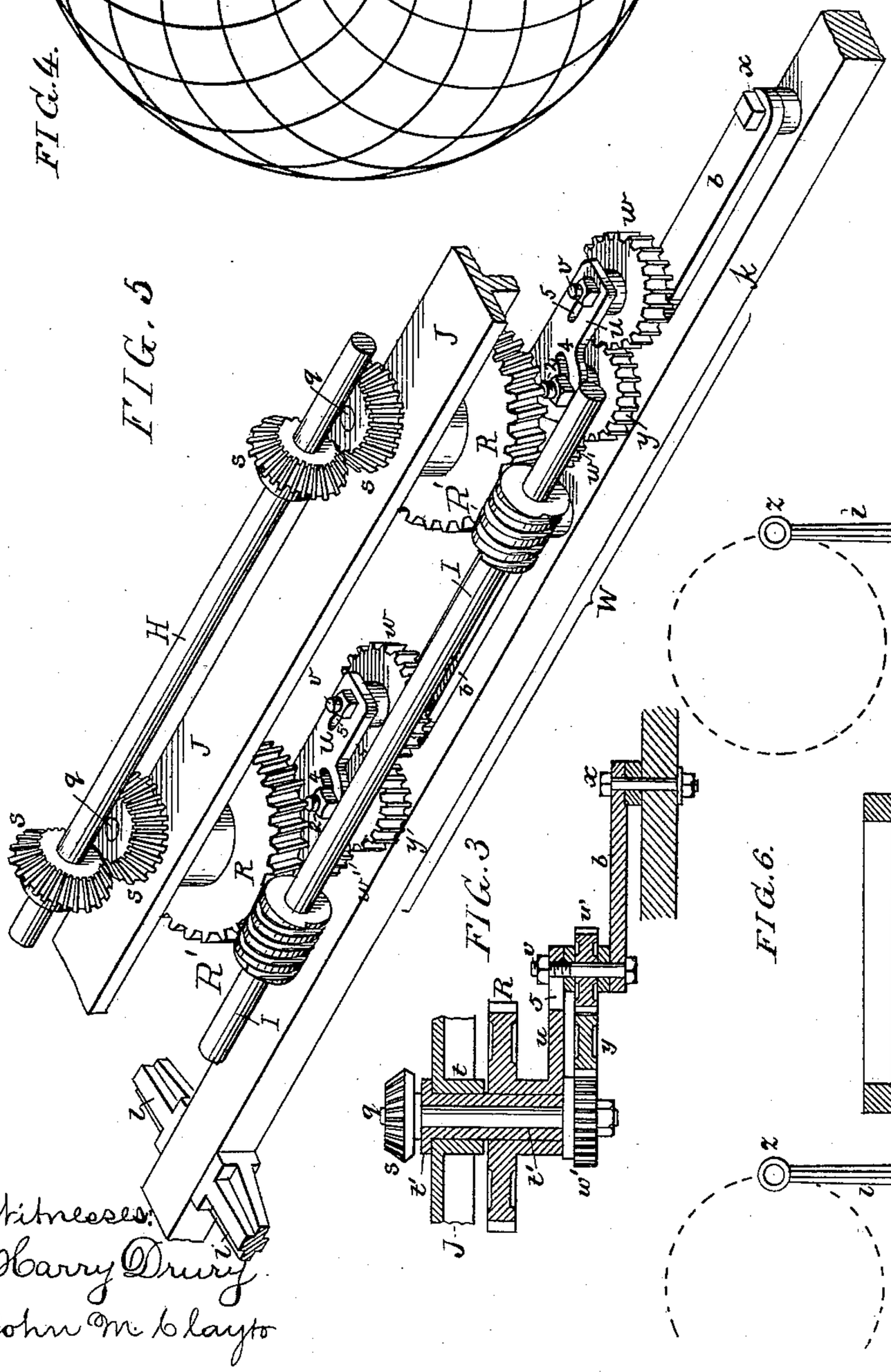


FIG. 3

FIG. 7.

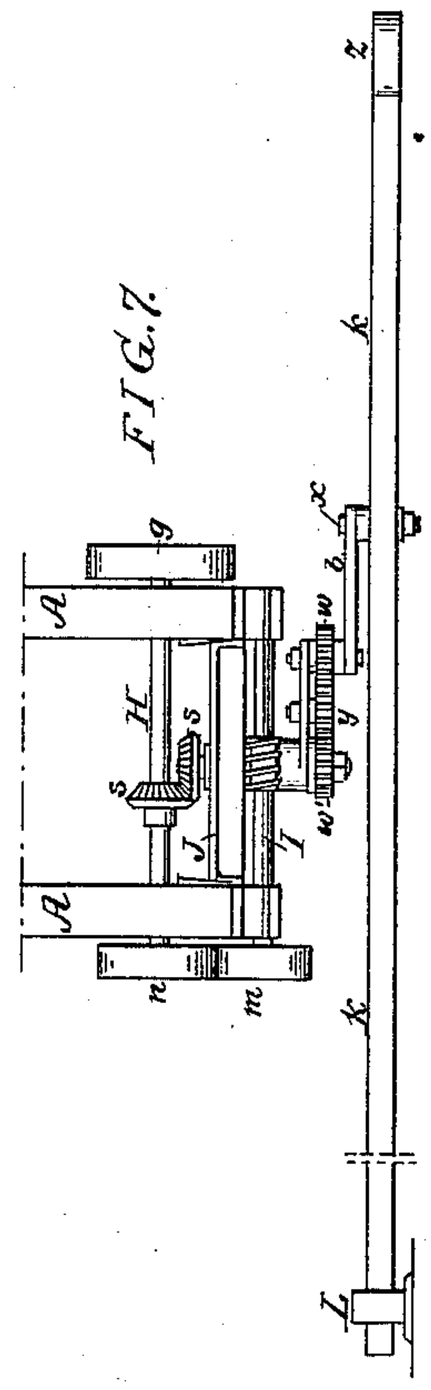
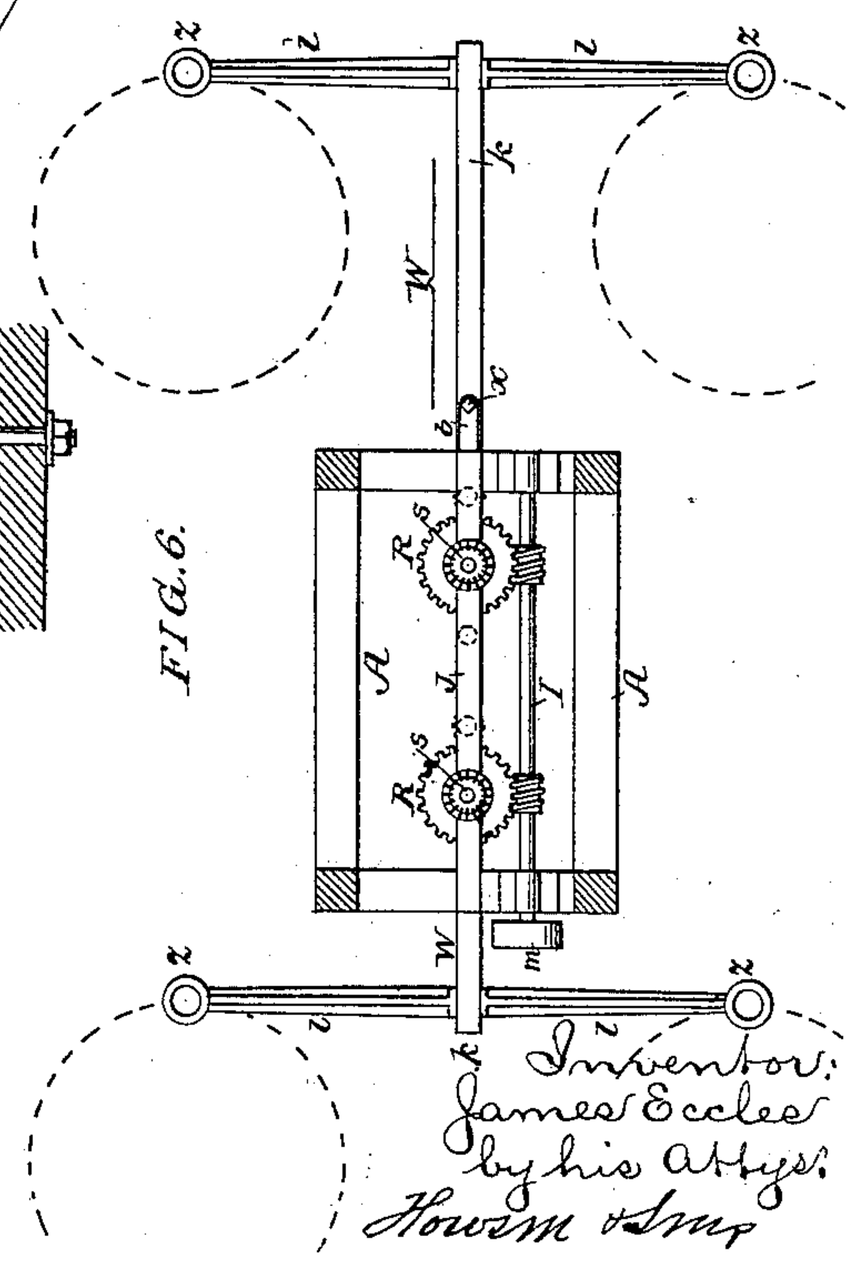


FIG. 6.



Witnesses:
Harry Drury
John M. Clayton

Inventor:
James Eccles
by his Attys:
Howson & Sons

(No Model.)

4 Sheets—Sheet 4.

J. ECCLES.

MACHINE FOR COILING WARPS.

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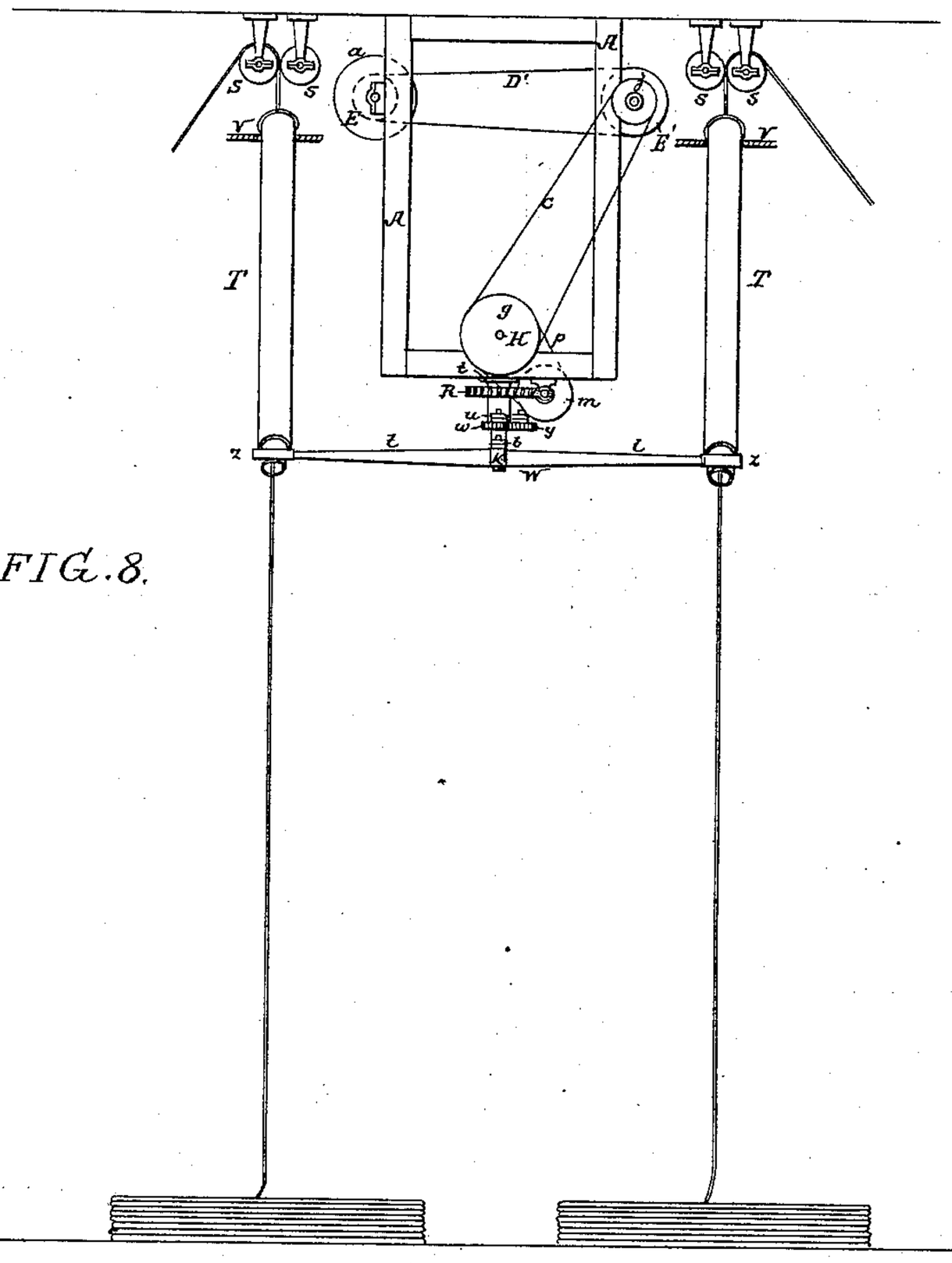

FIG. 8.

Witnesses:
Alf. Barkoff
Jos. A. Klein.

Inventor:
James Eccles.
by his Attorneys
Howson & Sons

UNITED STATES PATENT OFFICE.

JAMES ECCLES, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR COILING WARPS.

SPECIFICATION forming part of Letters Patent No. 349,148, dated September 14, 1886.

Application filed November 11, 1884. Serial No. 147,613. (No model.)

To all whom it may concern:

Be it known that I, JAMES ECCLES, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Machines for Coiling Warps, of which the following is a specification.

My invention consists of mechanism, fully described and claimed hereinafter, whereby warps may be rapidly and accurately coiled into uniform bundles, warps having been heretofore coiled or folded into bundles in a very irregular manner, usually by hand.

In the accompanying drawings, Figure 1 is a side view, partly in section, of the warp-coiling machine. Fig. 2 is an end view, partly in section. Fig. 3 is a vertical section on the line 1 2, Fig. 2, illustrating but one set of operating devices, of which two sets are shown in Fig. 1. Fig. 4 is a diagram illustrating the manner in which the warp is coiled. Fig. 5 is a perspective view of the coiling-frame and machinery connected therewith. Fig. 6 is a sectional plan on the line 3 4, Fig. 1, drawn to a reduced scale. Fig. 7 is a side view, illustrating a modification of my invention; and Fig. 8 is a side view, partly in section, on a reduced scale, of the complete mechanism, showing the floor or other stationary support for the warp-bundles.

A pendent frame, A, is secured to the rafters and above the floor of an apartment, and on this frame are the bearings for the two shafts, B and D, the latter being furnished with the usual fast and loose pulleys, *a a'*, for the driving-belt, and on the same shaft D is a cone-pulley, E, corresponding with a similar cone-pulley, E', on the shaft B, the two cone-pulleys being arranged one the reverse of the other, as usual. A belt, D', passes round both cone-pulleys and between the prongs of a belt-shifter, F, which is controlled by the screw-shaft G, having its bearings in the frame A. I use in the present instance a counter-shaft, *h*, provided with a handle, *d*, for operating the screw-shaft, the said shaft *h* having its bearings in brackets *e e*, secured to the frame A, and the two shafts being geared together by bevel-wheels *f f*.

The cone-pulleys E E' serve to regulate the speed of the coiling-frame without varying the speed of the delivering-rollers, described hereinafter.

The devices above described form no part of my invention, as they are well-known adjuncts to other machines. The pendent frame has also bearings for the two shafts, H and I, the former having a pulley, *g*, round which and round a pulley, *j*, on the shaft B, passes a belt, *c*, and the shaft I has a pulley, *m*, round which and round a pulley, *n*, on the shaft B passes a belt, *p*.

Other mechanism for driving the shafts H and I will readily suggest themselves to expert mechanics.

On a cross-bar, J, of the frame are two bearings, *t t*, carrying sleeves *t'*, which form bearings for the vertical shafts *q q*, the latter being geared by bevel-wheels *s s* to the shaft H.

There are two mechanisms, Y Y', Fig. 1, each connected with one of the shafts *q*, and hence a description of one will suffice for both. Turning loosely on each sleeve *t'* is a worm-wheel, R, driven by a worm, R', on the shaft I, and having an arm, *u*, to which is secured a stud, *v*, a cog-wheel, *w*, loose on the said stud, being geared to the wheel *w'* on the shaft *q* by an intermediate wheel, *y*. (See Fig. 3.) A pin, *x*, connected to an arm, *b*, secured to or forming part of the wheel *w*, fits loosely in the coiling-frame referred to hereinafter.

Taking one of the above-described mechanisms, including the rotating shaft *q*, the wheel R, and the arm *b*, rotated on a pin carried by an arm, *u*, of the wheel R, the pin *x* will have two movements, one being its rotation in a circular path round the axis of the stud *v*, and the other being a constantly advancing movement in an annular course, due to the rotation of the said stud round the axis of the shaft *q*. In consequence of these two movements the pin *x* will pursue the course indicated by the diagram Fig. 4, the pin making a succession of convolutions, continually advancing in an annular course.

W is the coiling-frame, consisting of a bar, *k*, from which project arms *l*—four in the present instance; and this frame is carried by the pins *x x* of the mechanisms Y Y', the pins being attached to the arms *b b*, and loose in the frame; or the pins may be secured in the frame and loose in the arms. The end of each arm *l* will pursue precisely the same course as that pursued by the pin *x*, and consequently if a warp be directed through each of the eyes *k*,

at the ends of the arms *l* of the coiling-frame, it will be coiled on the floor X, or other stationary support, in the manner indicated in the diagram Fig. 4, and as the movement of the mechanism continues the warp will be formed into a bundle consisting of a succession of convolutions arranged in the annular course shown by dotted lines in Fig. 6.

The cog-wheel *w* on the arm *b* might be geared directly to the wheel *w'*; but I prefer the use of an intermediate wheel, *y*, on a stud, 2, which can be adjusted in a slot, 4, in the arm *u*. I also prefer to make the pin *v* adjustable in a slot, 5, in the arm *u*, Fig. 5, as these facilities for adjustment permit me to so change the position of the wheels as to alter the relation of the pin *v* of each rotating arm *u* to that of the shaft *q*, in order to diminish or increase the radius of the circle in which the pin *v* travels, thereby making larger or smaller bundles of warps.

S S are the feed-rolls for delivering the warps to the eyes *z*, the journals of these rolls being adapted to fixed bearings on the ceiling, and each warp being guided to the eye by a tube, T, which is contracted at the lower end, so as to form a shoulder, *i*, which bears upon the upper edge of the eye *z*, the contracted portion passing through the eye, as shown in Figs. 1 and 2. The upper end of the tube passes through and is supported laterally by a bar, V, secured either to the frame of the machine or to the bearings S of the feed-rollers, as circumstances may permit. By this means the passage of the warps through the eyes is insured, whatever may be the position of said eyes in respect to the feed-rolls.

The coiling-frame may be constructed in different ways without departing from my invention. For instance, but one warp has to be coiled, only one of the mechanisms Y may be used, (see Fig. 7,) the bar *k* in this case sliding in a swiveled bearing, L. As before remarked, the journals of the feed-rolls S S for each warp are adapted to stationary bearings, and the warp delivered by the rolls passes freely through the guide-eye, so that no twist is imparted to the said warp, this being an essential feature of my invention, and one in which it differs from sliver-carrying machines—such, for instance, as are shown in English Patents No. 10,106 of 1844, and No. 11,271 of 1846—for in the latter the feed-rolls for the sliver are caused to traverse in a circular course to form the convolutions of the sliver, and in consequence twist is imparted to the sliver. This, while an advantage to a sliver-carrying machine, would be a fatal defect in a warp-balling machine, as one of the main requirements of such a machine is that it shall lay the warp perfectly straight, so that it can be readily unwound from the ball onto a warp-beam.

I therefore claim as my invention—

1. The combination of feed-rolls adapted to fixed bearings, with a coiling-frame having beneath said rolls a guide-eye, through which the warp delivered by the rolls can freely pass, and with mechanism, substantially as described, whereby the coiling-frame is caused to traverse in a circular path, all substantially as specified.

2. The combination of feed-rolls adapted to fixed bearings, a coiling-frame having beneath said rolls a guide-eye, through which the warp delivered by the rolls can freely pass, an arm carrying said coiling-frame, a second arm carrying the center pin of the first, and mechanism, substantially as described, for rotating both arms, whereby the guide-eye is caused to traverse in a circular path, the axis of which is constantly advancing in an annular course, all substantially as specified.

3. The combination of a coiling-frame, an arm, *b*, carrying the same, a pivot-pin for said arm, an arm, *u*, carrying said pin, a sleeve to which said arm *u* is secured, a shaft passing through said sleeve, gearing whereby said shaft is connected to the arm *b*, and mechanism for rotating the sleeve and shaft, all substantially as specified.

4. The combination of a coiling-frame, a pair of arms, *b*, carrying the same, pivot-pins for said arms, a pair of arms, *u*, carrying said pins, sleeves to which the arms *u* are secured, shafts passing through said sleeves, gearing whereby each of said shafts is connected to one of the arms *b*, gearing for connecting the two sleeves, gearing for connecting the two shafts, and mechanism for rotating the sleeves and shafts, all substantially as specified.

5. The combination of the coiling-frame, an arm, *b*, carrying the same, a pivot-pin, *v*, for said arm, an arm, *u*, carrying said pin, a sleeve to which said arm *u* is secured, a shaft passing through said sleeve, means for rotating the shaft and sleeve, spur-wheels *w*, *w'*, and *y*, whereby the shaft is geared to the arm *b*, and means for adjusting the pivot-pin *v* and the spur-wheel *y*, all substantially as specified.

6. The combination of the feed-rolls adapted to fixed bearings, the coiling-frame having a guide-eye beneath said rolls, mechanism, substantially as described, for causing said coiling-frame to traverse in a circular path, a guide-tube having at the lower end a bearing in the guide-eye of the coiling-frame, and a fixed eye forming a bearing for the upper end of said guide-tube, all substantially as specified.

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

JAMES ECCLES.

Witnesses:

JOHN M. CLAYTON,

HENRY HOWSON, Jr.