

PATENTED DEC 20 1870.

George Draper's Impt. in Machinery for Dressing Warps.

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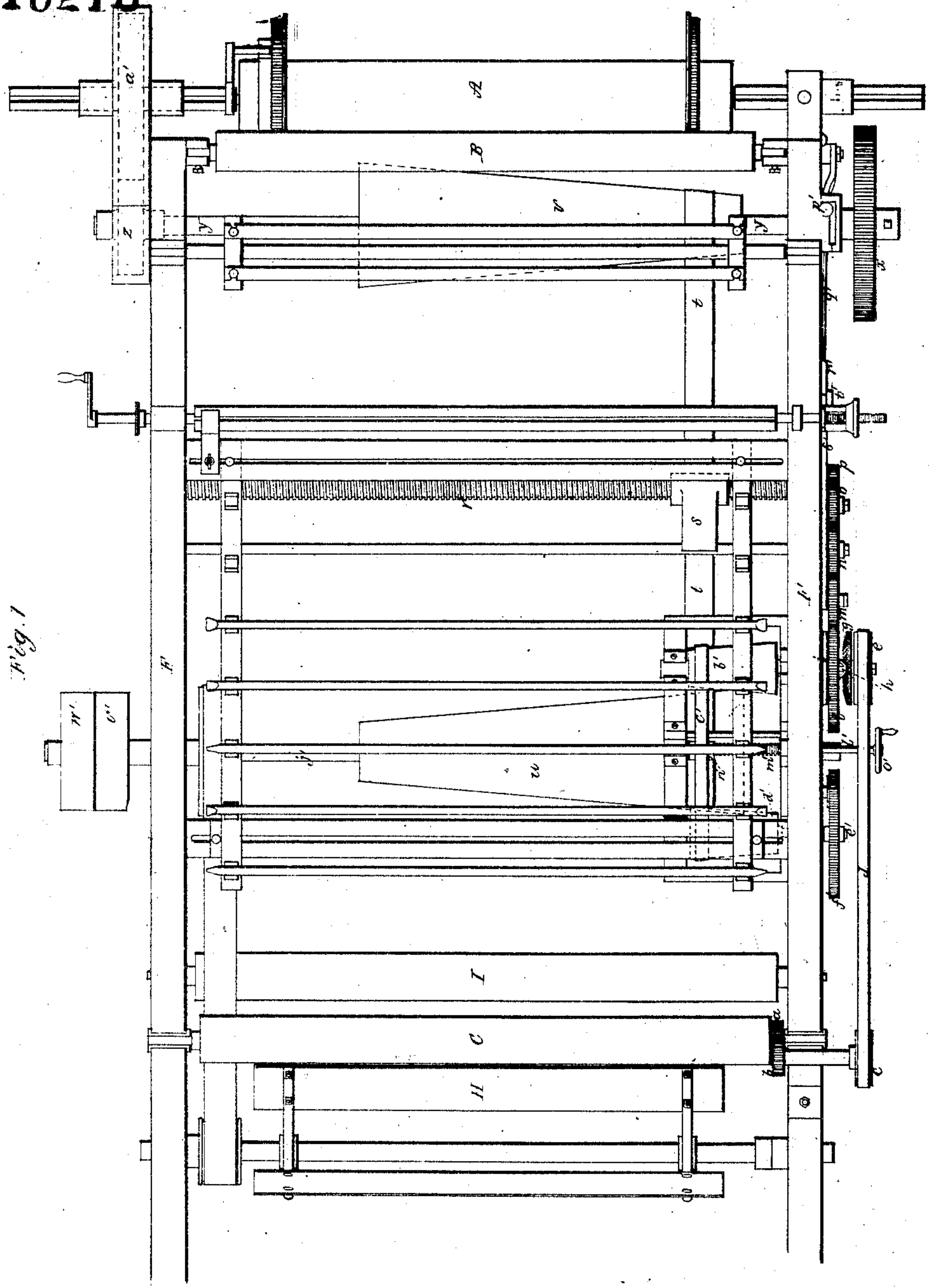


Fig. 1

Witnesses
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by his attorney
R. W. May

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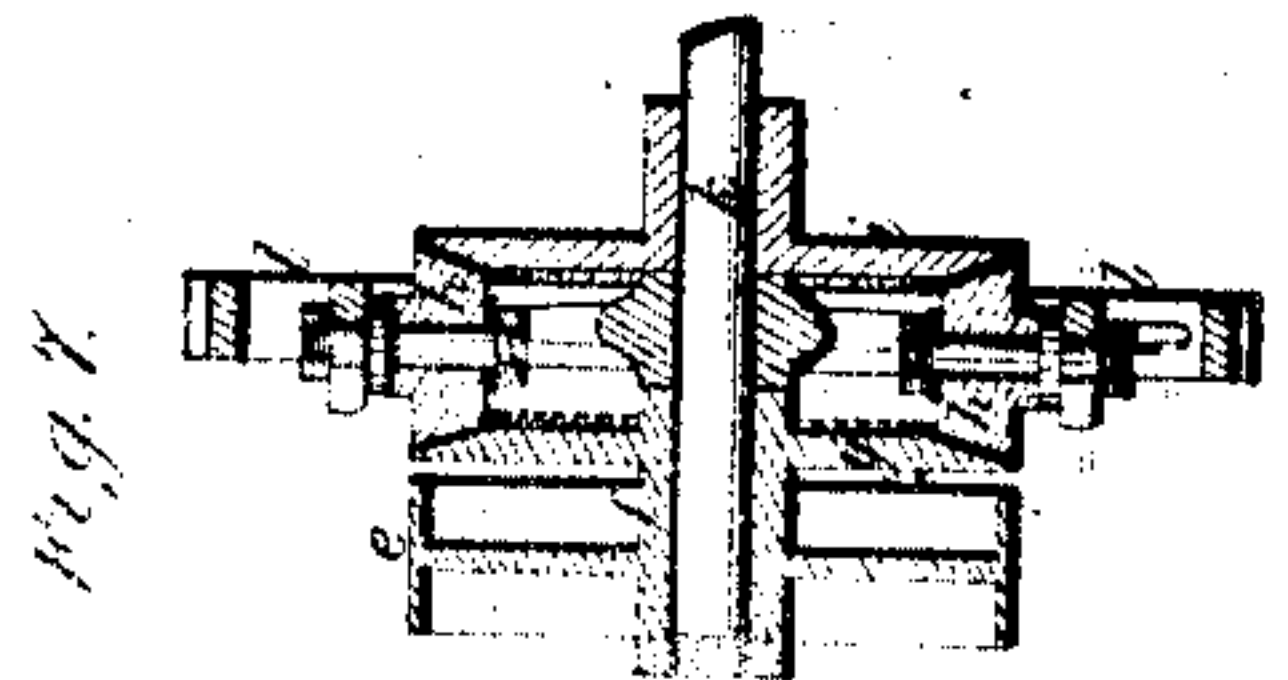
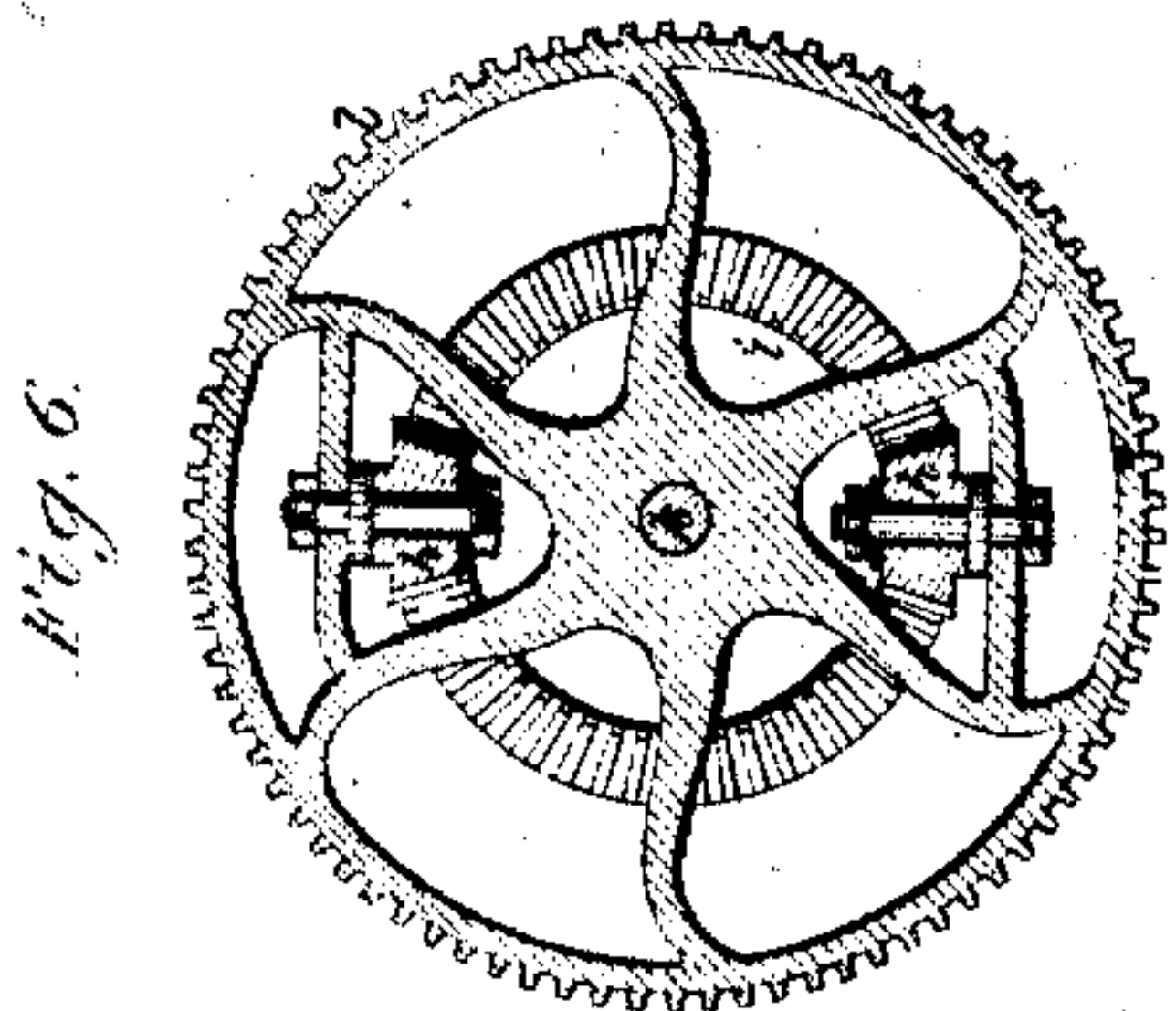
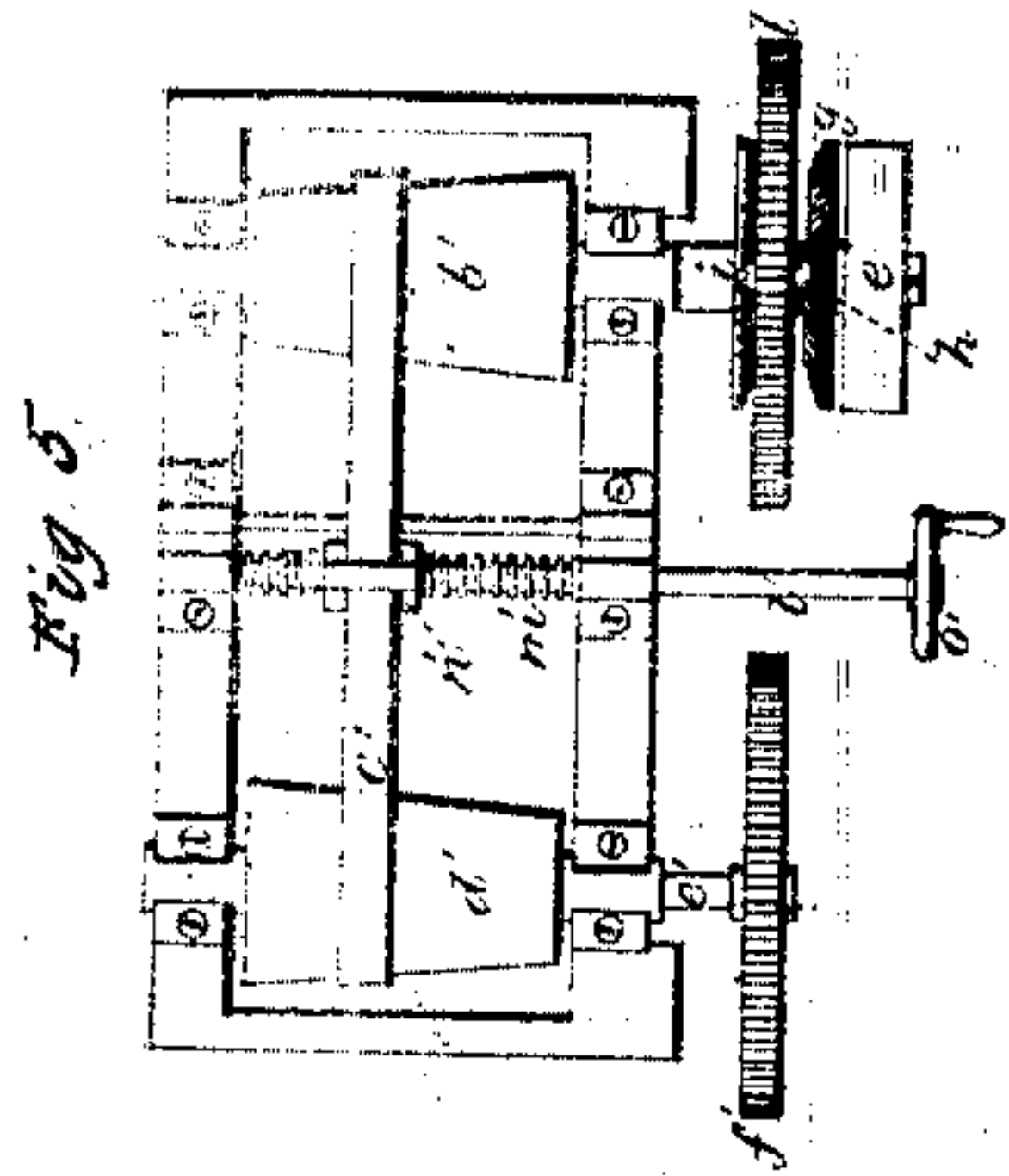
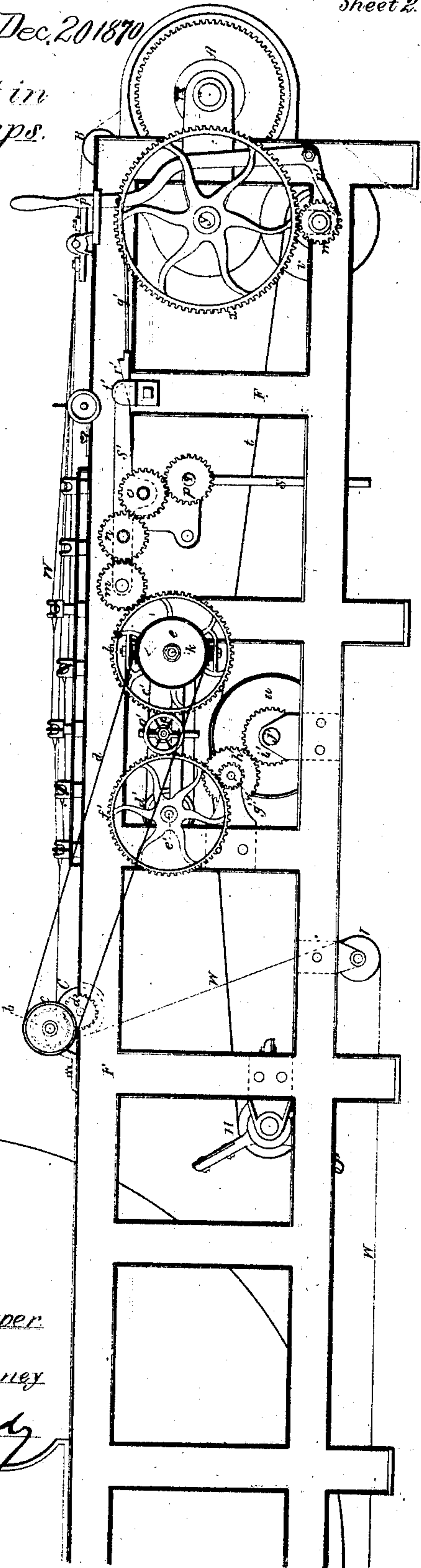


Fig. 2.



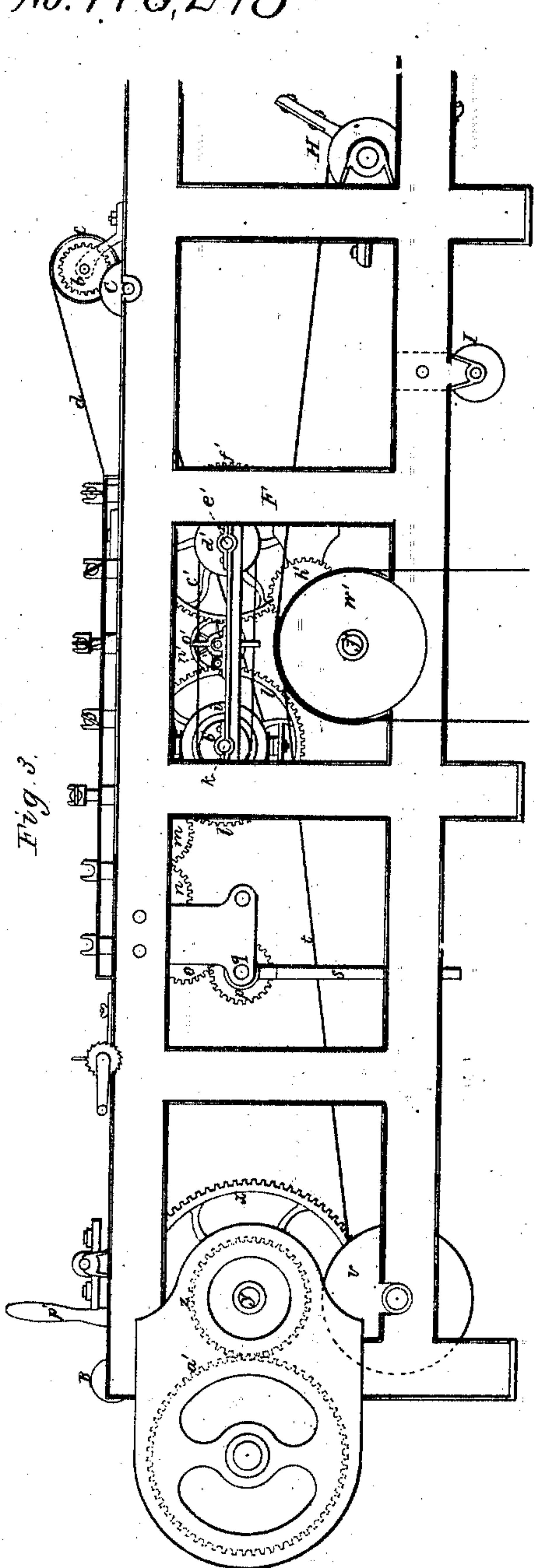
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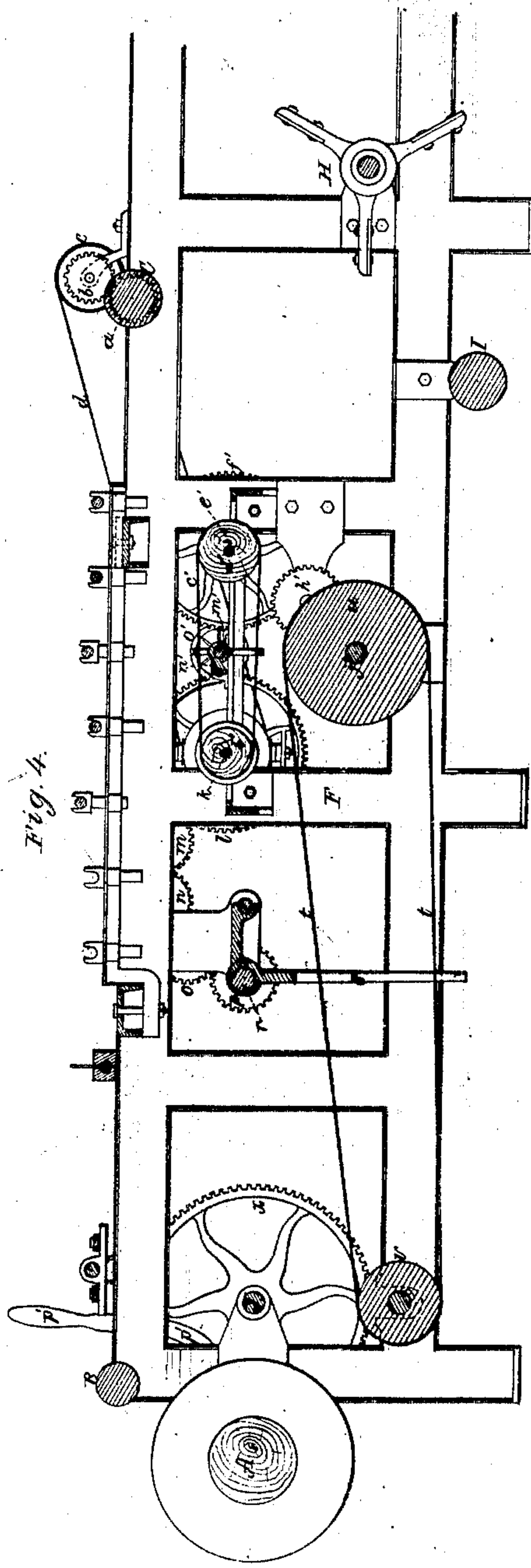
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George Draper's Impt. in Machinery for Dressing Warps.

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Witnesses
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 by his attorney
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United States Patent Office.

GEORGE DRAPER, OF HOPEDALE, MASSACHUSETTS.

Letters Patent No. 110,218, dated December 20, 1870.

IMPROVEMENT IN MACHINES FOR BEAMING YARN OR WARPS.

The Schedule referred to in these Letters Patent and making part of the same.

To all persons to whom these presents may come:

Be it known that I, GEORGE DRAPER, of Hopedale, of the county of Worcester and State of Massachusetts, have made new and useful invention having reference to Machines for Beaming Yarn or Warps; and do hereby declare the nature and purpose of the said invention, and the manner in which it is to be performed or is constructed and operated, to be hereinafter described, reference being had to the accompanying drawing, in which the said invention is represented in its application to what is technically called a "slasher."

The main purpose of the invention is to effect the winding of the yarns or warps on the warp-beam or roller at a uniform speed or velocity while the winding may be in the process of being carried on. In other words, the mechanism constituting the invention is for maintaining uniformity of wind or surface-speed of wind of the yarn on the beam.

When a warp-dresser or a slasher-beam is driven or revolved at a uniform speed the yarn or quantity wound thereon will have its draft or velocity of wind increased as the mass on the beam may increase in diameter.

With my invention, notwithstanding the constant variation in the diameter of the mass of the yarn on the beam, the yarn will be wound upon the beam with a uniform velocity.

Furthermore, the degree of velocity of wind of the yarn may be varied at will, and to a greater extent, by my invention than by any other known to me.

The velocity of the winding of the yarn on the beam will remain uniform until the machinery may be set to produce a different rate of speed or wind of such yarn.

In carrying out my invention I do not employ, on a vertical shaft connected with the yarn-beam by a train of gears, a friction-wheel to slide on such shaft or on a "feather" or rib extended therefrom, and also to rest circumferentially against the side of a driving-disk to be put in revolution by another shaft, such mechanism being very uncertain for operating the yarn-beam, although the velocity of motion of such may be changed by moving the friction-wheel nearer to or further from the center or axis of the driving-disk.

I have substituted for such friction-wheel and disk a set of cone-pulleys or drums, an endless belt, and certain other mechanism, to be hereinafter described. I have also made other important changes, all of which I shall now proceed to explain.

In the drawing—

Figure 1 denotes a top view;

Figures 2 and 3, side elevations; and

Figure 4, a longitudinal section of portions of a

slasher, with my mechanism or invention applied thereto.

Figure 5 is a top view;

Figure 6, a longitudinal section; and

Figure 7, a transverse section of portions of what I term the "compound motion," and sundry accessories, the nature of which and their modes of operation being hereinafter particularly defined.

In figs. 1, 2, 3, and 4 of such drawing—

F denotes a portion of the frame, and

G, a part of the drying-drum of a slasher, while

H denotes the rotary fan or blast-wheel.

A is the yarn-beam or roller upon which the warps or yarn are to be wound.

B and C are guide-rollers, on which the warps pass during their passage from a roller, I, to the beam A, all of which is the same as in an ordinary slasher.

The warp or warps are shown in fig. 2 by the line or lines W.

It will be evident that the rate of velocity of the periphery of each of the guide-rollers, B, C, and I must correspond with that of the mass of yarn wound on the beam, or with that of the yarn as drawn over such rollers B C I.

On the shaft of either of the rollers C I, and at or near the outer end of such shaft, there is fixed a spur-gear, *a*, to engage with another such gear, *b*, fixed upon a short shaft, provided with a driving-wheel, *c*.

An endless belt, *d*, goes around the wheel *c*, and another wheel, *e*, fixed on a short tubular shaft or sleeve, *f*, (see fig. 7.)

The shaft *f* revolves freely on another or longer shaft, *k*, and is provided with a bevel-gear *g*, that engages with two bevel-pinions, *h h*, whose spindles are arranged in and supported by a spur-gear, *l*, all as represented.

The spur-gear *l* is to revolve freely on the shaft *k*, and to run between the said gear *g* and another such bevel-gear, *i*, fastened to the shaft *k*.

The gear *l* engages with a spur-gear, *m*, of a train of gears, *m n o p*, arranged as represented.

The two intermediate gears *n o* have their axes or pivots projected from and supported by a lever, *s*, whose fulcrum is the axle or pivot of the gear *m*.

The gear *p* is fixed on a horizontal shaft, *q*, extending across the frame of the machine, and being provided with a long screw, *r*.

The said screw extends through or works in a belt-shifter, *s*, applied to an endless belt, *t*, arranged upon two conical drums or pulleys, *u v*.

The cone-drum *u* is fixed on a shaft, *j*, provided with a driving-pulley, *e'*, and a loose pulley, *w*.

On the shaft of the cone-drum *v* is a spur-gear, *w*,

(see fig. 2,) that engages with a larger gear, *z*, fixed on one end of a shaft, *y*, which on its opposite end carries a spur-gear, *z*, to engage with another spur-gear, *a*, fixed on the shaft of the yarn-beam A.

On the shaft *k* of the bevel-gear *i* there is a cone-drum, *b*, which, by means of an endless belt, *c*, receives rotary motion from another cone-drum, *d*, fixed upon a shaft, *e*.

On the shaft *e* is a gear, *f*, that receives motion from a train of gears, *g*, *h*, and *i*, the latter of which is fixed on the driving-shaft *j*.

A screw, *m*, having its shaft *l* duly supported in boxes, so that the screw can have a rotary motion only, screws through a belt-shifter, *n*, applied to the endless belt *c*.

There is a cranked wheel, *o*, fixed on the shaft *l*. By taking hold of the handle of the cranked wheel and turning the wheel the screw *m* may be revolved so as to move the belt *c* on and endwise of the cone-drums *b* & *d*.

From the above it will be seen that, when the driving-shaft *j* is in revolution, the yarn beam A will have a rotary motion imparted to it by means of the cone-drum *a*, the endless belt *t*, the cone-drum *v*, and the train of gears *w* *x* *z* *a* and their shafts, such constituting in substance the mechanism for effecting rotary motion of the yarn-beam.

Furthermore, it will also be seen that there is applied to the belt *t*, of the said mechanism, a mechanism for gradually moving it from the smaller to the larger end of the cone-drum *v* as the mass of yarn wound on the beam A may increase in diameter, the purpose of such mechanism being to gradually slacken the speed of the beam A.

This latter mechanism is composed substantially of the train of gears *i* *h* *g* *f*, the cone-drums *d* and *b*, the endless belt *c*, the train of gears *l* *m* *n* *o* *p*, the shafts *k*, *e*, and *q*, the screw *r*, and the belt-shifter *s*.

Were such the only mechanism employed for actuating the beam A it would have a constant decrease of velocity imparted to it, such being regulated or determined according to the position of the belt *c* on the drums *b* & *d*.

Now a constant decrease in the velocity of the yarn-beam will not suffice to enable it to properly take up or wind up the yarn or warps; for as the amount wound on the beam may increase in diameter, the yarn would be wound up too fast and its draft would be increased to too great an extent.

To reduce the velocity of the beam, or regulate such so as to cause it to impart to the surface of the wind a uniform velocity as it may increase in diameter, it becomes necessary to combine with the mechanism last described another, viz., that composed of the gears *a* *b*, the pulley *c*, the endless band *d*, the pulley *e*, the shaft *f*, and gears *g*, *h*, and *i*, such being applied together, and to the shaft *k* and the yarn-guide roller C, in manner as described and represented.

This latter mechanism may be termed the "compound motion."

Its mode of operation may be thus described.

When there is any tendency of the beam A to take or wind up the yarn too fast, a corresponding increase will take place in the rotary motion of the guide-roller C, which will be imparted to the bevel-gear *g*, thereby causing it to revolve faster than its fellow gear *i*.

In consequence of this the gear *g* will, by its action on the gear *h*, cause the gear *l* to revolve, whereby the screw *r* will be put in revolution and the belt *t* will be moved up the drum *v*.

It necessarily follows from this that the speed of the beam A will be slackened to the requisite extent.

By moving the belt *c* on the cone-drums *b* & *d* we are able to vary the speed of the beam A more or less as occasion may require.

So long as the two gears *g* & *i* may revolve at a like speed, the gear *l* will remain stationary relatively to such gears *g* & *i*; but, as soon as an increase of speed takes place in the gear *g* over that of the gear *i*, there will be produced a corresponding movement of the gear *l*, whereby a relative motion will be imparted to the screw *r*.

In the drawing—

p exhibits a "shipper" or lever applied to the box of one of the journals of the shaft of the cone-drum *v*, such box resting on the shorter arm of such lever, and being applied to the frame F so as to be capable of being moved vertically thereon.

By moving the lever *p* the gear *w* may be thrown either out of or into engagement with the gear *z*, thereby effecting a stoppage of the yarn-beam A or a starting of it, as occasion may require.

It being desirable to arrest the rotary motion of the screw *r* simultaneously with the stoppage of the yarn-beam, and to start the said screw simultaneously with the starting of the yarn-beam, I have applied to the lever *s* a wedge, *r'*, resting in or on a stationary bracket, *t'*, such wedge being connected with the lever *p* by means of a rod, *q*, all as represented.

The said wedge, when pushed forward by the lever *p*, will raise the lever *s* so as to lift the gear *o* out of engagement with the gear *p*, thereby causing a cessation of motion of the screw *r*, and, as a consequence, a stoppage of motion of the belt-shifter *s*.

On drawing back the lever *p* so as to raise the gear *w* into engagement with the gear *z*, the wedge *r'* will be retracted so as to allow the lever *s* to fall by its gravity and engage the gear *o* with the gear *p*.

The mechanism hereinbefore described not only performs the functions as hereinbefore stated, but readily and quickly adjusts itself to an empty beam when put in the place of a full one or one previously removed from the frame, thus saving the necessity, which would otherwise result, of having the endless belt of the main drums *u* & *v* moved by an attendant back to the necessary starting position.

The change is effected without any attention on the part of the attendant.

The screw *r* will be rapidly revolved in a direction opposite to that it previously had, the movement being continued until the two gears *g* & *i* of the compound motion revolve with a like speed, after which the motion of the screw will be reversed, and it will be caused to actuate the belt-shifter *s* in an opposite direction and as may be required.

I make no claim to any combination or arrangement of devices as shown in the United States Patent No. 25,266, my invention being what, with reference to the machine described in such patent, may be considered as an improved machine, one specially applicable to a slasher of ordinary construction, one in most respects more efficient and accurate and sensitive in its operations.

I claim—

1. The combination as well as the arrangement of the mechanism for effecting rotary motion of the yarn-beam, the same consisting of the cone-drums *u* & *v*, the belt *t*, and the gears *w* *x* *z* *a* and their shafts, with the mechanism for gradually moving the belt *t* from the smaller to the larger end of the drum *v*, such consisting substantially of the train of gears *i* *h* *g* *f*, the cone-drums *d* and *b*, the endless belt *c*, the train of gears *l* *m* *n* *o* *p*, the shafts *k* & *q*, the screw *r*, and the belt-shifter *s*, and with the compound motion as described, composed of the gears *a* & *b*, the pulley *c*, the endless belt *d*, the pulley *e*, the shaft *f*, and the

gears *g h* and *i* applied together and to the shaft *k*, and the yarn-guide roller *C*, in manner as described and represented.

2. The combination of the screw *m'* and the belt-shifter *n'*, or their mechanical equivalents applied to the belt *c*, with the mechanism for effecting rotary motion of the yarn-beam, the mechanism for gradually moving the belt *t* from the smaller to the larger end of the drum *v*, and with the compound motion, as described.

3. The combination of the wedge *r'*, lever *s'*, bracket *t'*, and rod *q'*, with the lever *p'*.

4. In combination with the mechanism for effecting the engagement and disengagement of the gears *w*

and *x*, and, with the gears *o p*, of the mechanism for moving the endless belt *t* along the drum *v*, a mechanism, substantially as described, or its equivalent, for effecting the simultaneous engagement or disengagement of the said gears *o p*, such mechanism consisting of the wedge *r'*, the lever *s'*, bracket *t'*, and the rod *q'*, applied to the lever *p'* and the gear *o* in manner and so as to operate and be operated essentially as hereinbefore explained.

GEORGE DRAPER.

Witnesses:

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J. R. SNOW.