

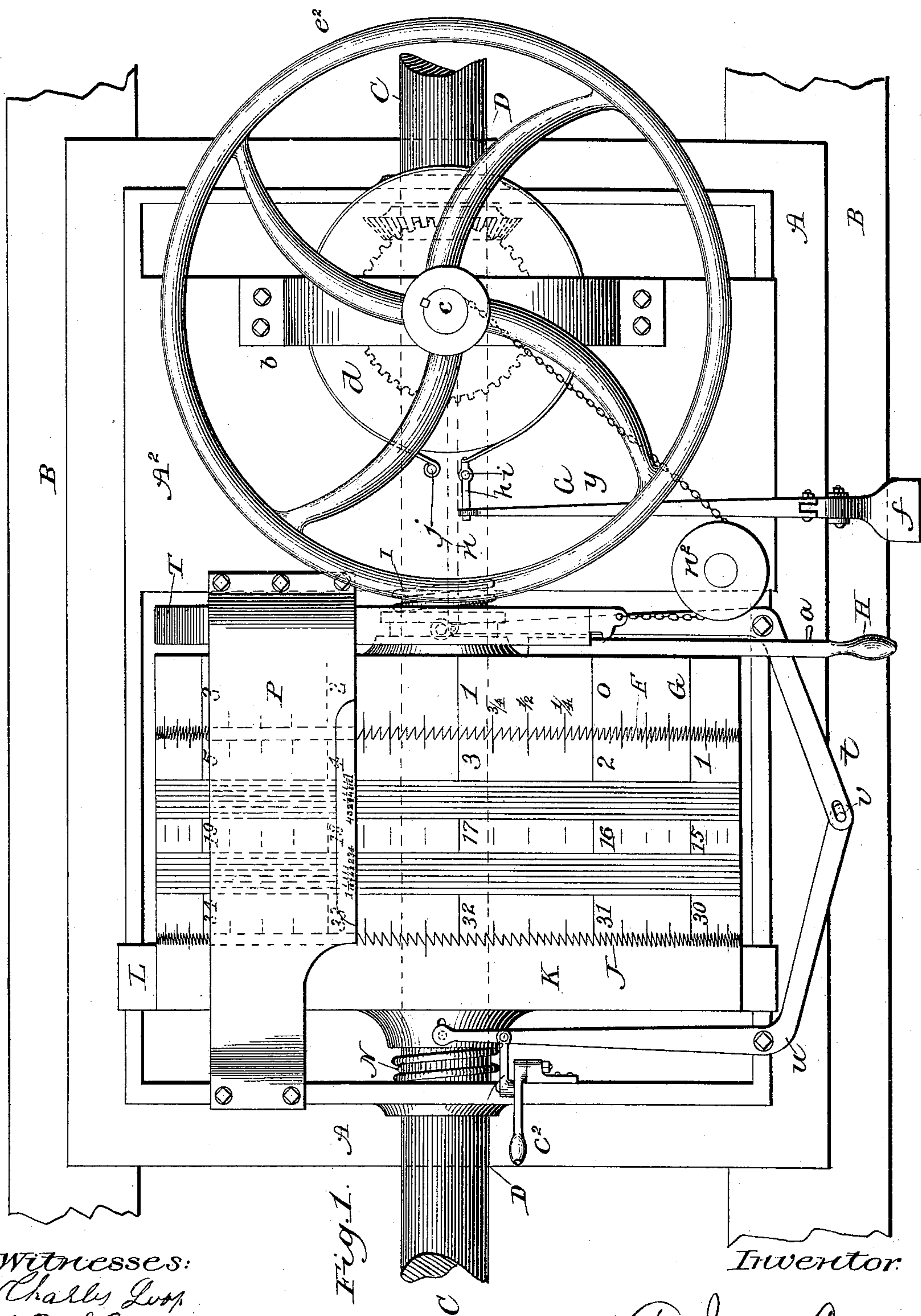
(No Model.)

5 Sheets—Sheet 1.

A. I. LOOP.
SAW MILL SET WORKS.

No. 338,684.

Patented Mar. 23, 1886.



Witnesses:
Chas. Loop
C. Lubke

Inventor:
A. I. Loop

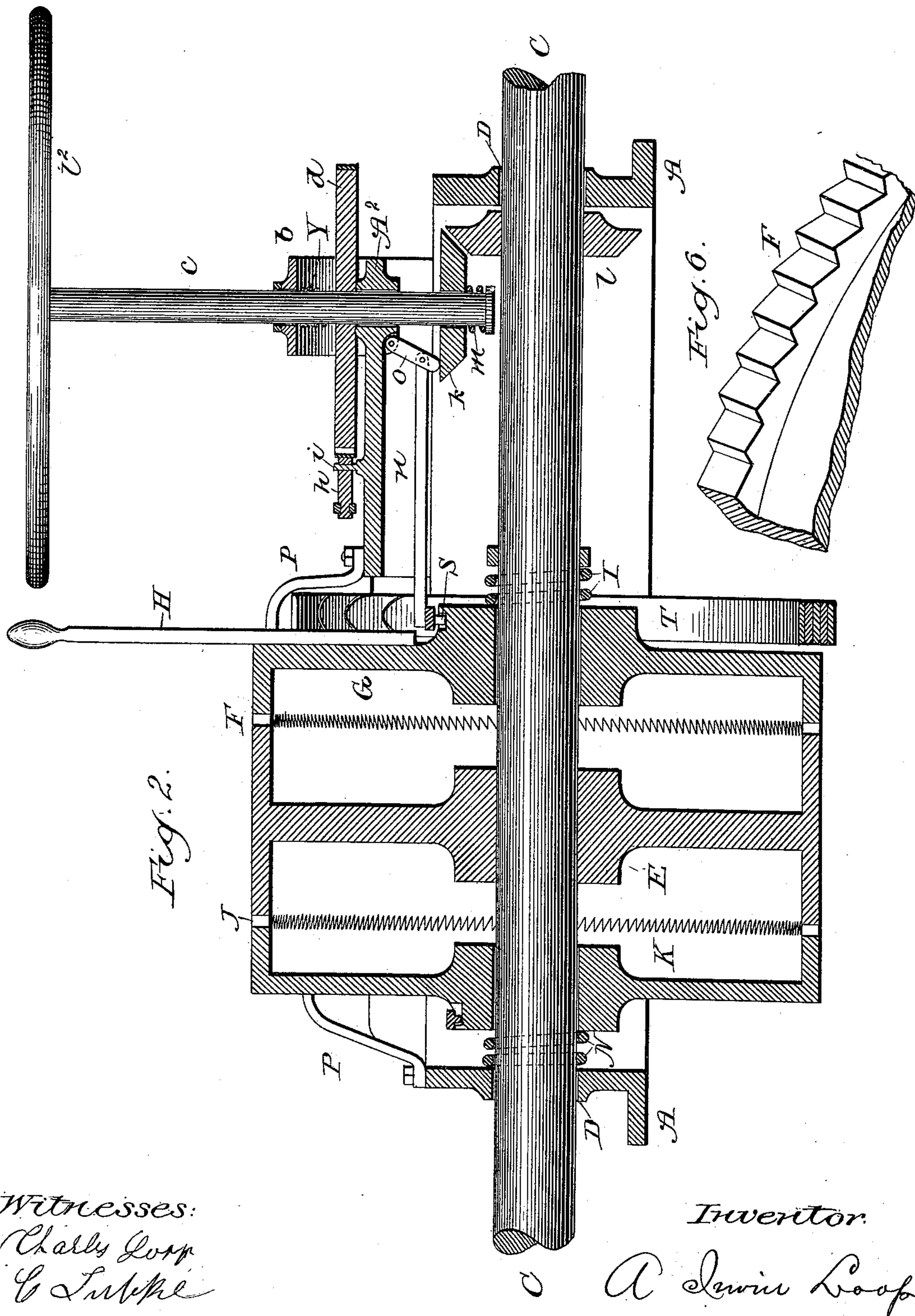
(No Model.)

5 Sheets—Sheet 2.

A. I. LOOP.
SAW MILL SET WORKS.

No. 338,684.

Patented Mar. 23, 1886.



Witnesses:
Chas. Loop
C. L. L. L.

Inventor:
A. I. Loop

(No Model.)

5 Sheets—Sheet 3.

A. I. LOOP.
SAW MILL SET WORKS.

No. 338,684.

Patented Mar. 23, 1886.

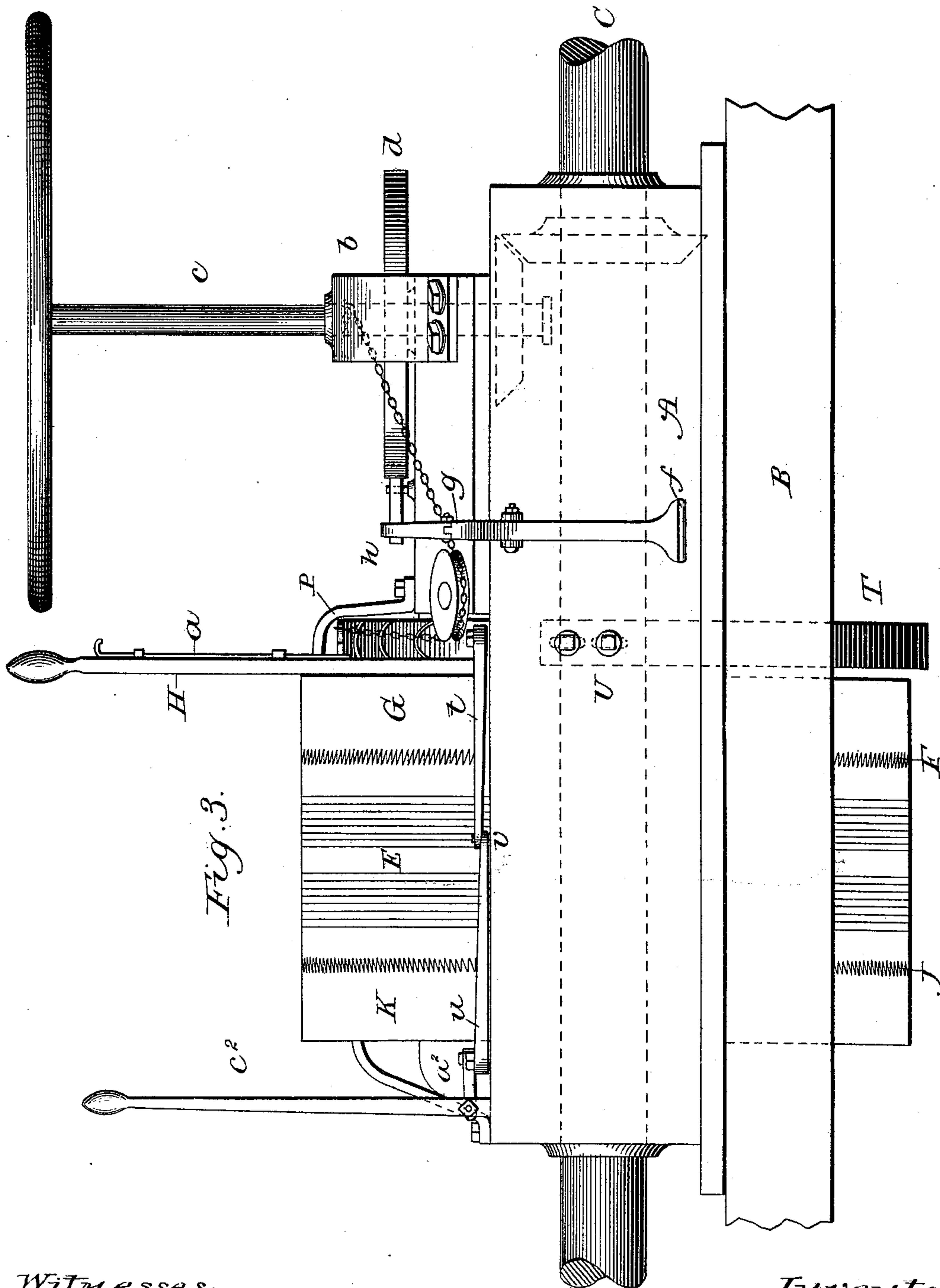


Fig. 3.

Witnesses:
Charles Loop
C. Lutke

Inventor:

A. Irwin Loop

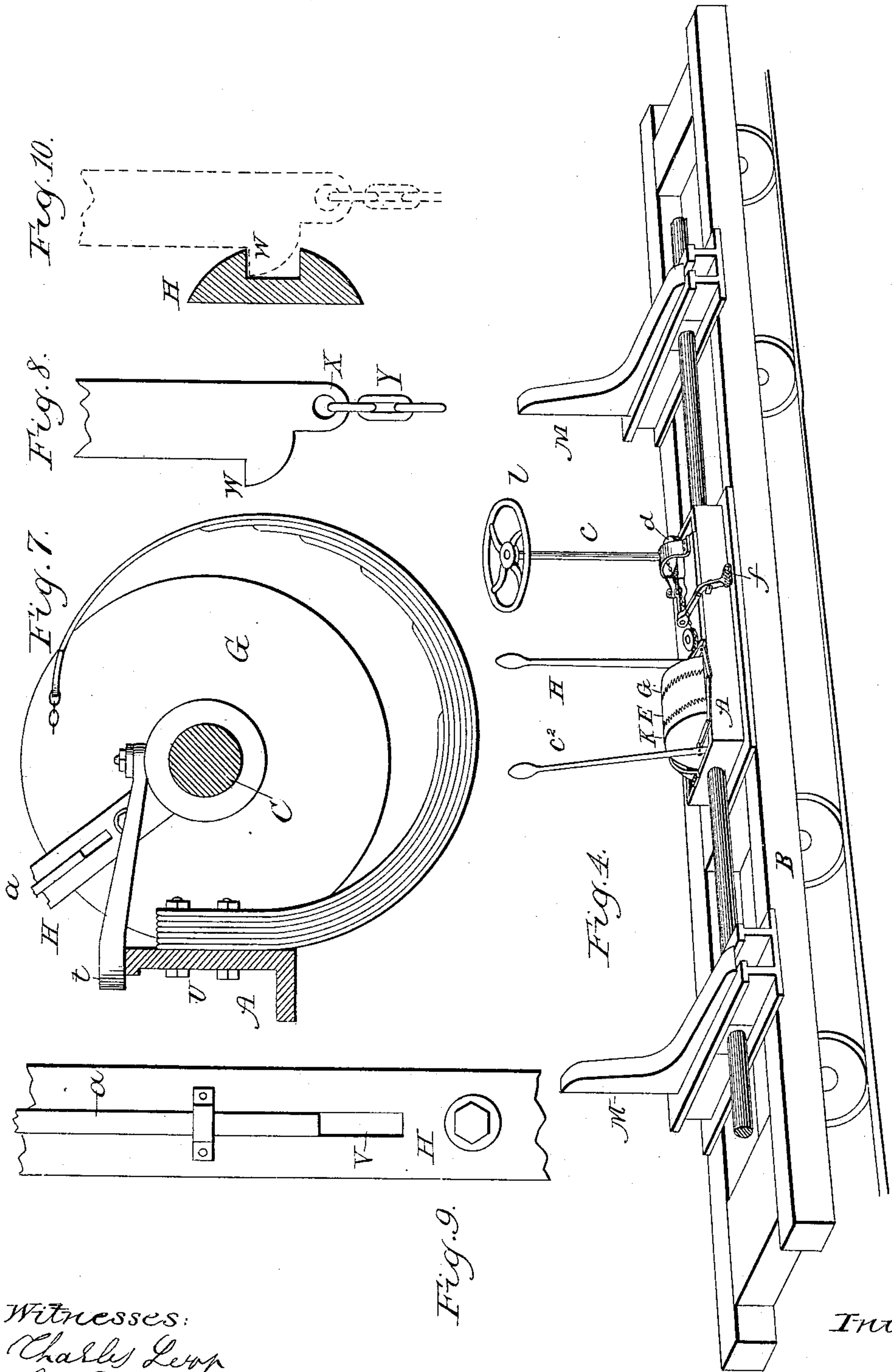
(No Model.)

5 Sheets—Sheet 4

A. I. LOOP.
SAW MILL SET WORKS.

No. 338,684.

Patented Mar. 23, 1886.



Witnesses:
Charles Loop
C. Lubke

Inventor:
A. I. Loop

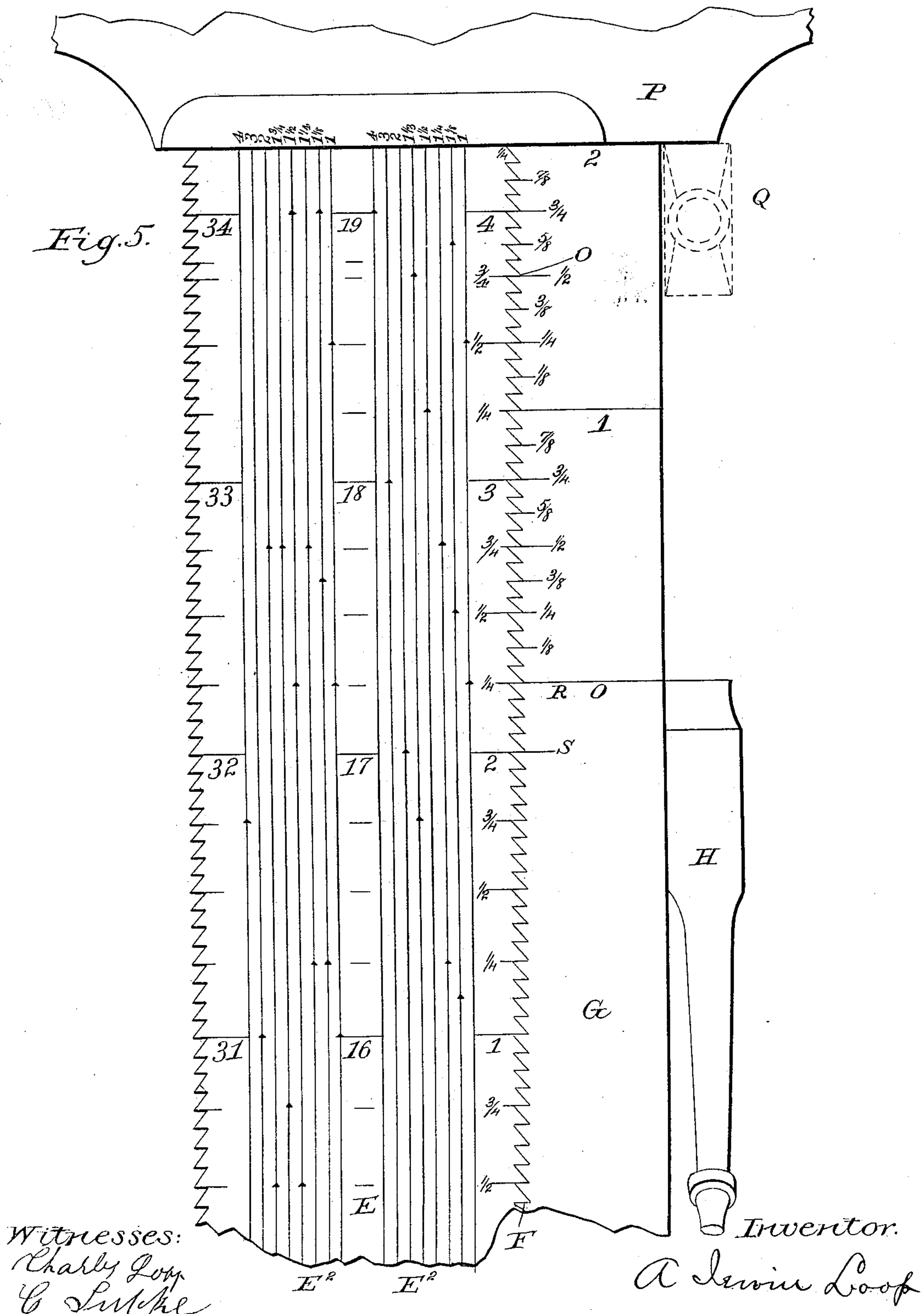
(No Model.)

5. Sheets—Sheet 5.

A. I. LOOP.
SAW MILL SET WORKS.

No. 338,684.

Patented Mar. 23, 1886.



UNITED STATES PATENT OFFICE.

A. IRWIN LOOP, OF NORTH EAST, PENNSYLVANIA, ASSIGNOR OF ONE HALF
TO WILLIAM H. STETSON AND CHARLES LOOP, BOTH OF SAME PLACE.

SAW-MILL SET-WORKS.

SPECIFICATION forming part of Letters Patent No. 338,684, dated March 23, 1886.

Application filed August 20, 1885. Serial No. 174,876. (No model.)

To all whom it may concern:

Be it known that I, A. IRWIN LOOP, of North East, in the county of Erie and State of Pennsylvania, have invented a new and
5 Improved Saw-Mill Set-Works, of which the following is a full, clear, and exact description.

My invention consists of a drum keyed fast to the setting-shaft, and fitted with the setting-lever by a rose clutch device on one side graduated to the smallest fraction of an inch that
10 may be required for graduating the thickness of the lumber to be sawed, together with a holding rose clutch device on the other side of said drum, and similarly graduated to effectually
15 prevent any slack motion of the setting-shaft; also, a heavy leaf-spring fastened at one end to the frame of the setting apparatus, and describing the same circle as the rim of setting-drum, having on the other end a lip that
20 may be connected or disconnected to the setting-lever at will of the setter; also being connected by the same end to a light steel chain or rope, which passes around an idler, and is fastened to a shaft, having on one end a large
25 hand-wheel and on the other end a bevel-gear fitted on a feather key, said shaft and chain being for the purpose of getting a tension on the leaf-spring to give the setter assistance in setting up large logs, and to run back the knees
30 by the bevel-gear meshing with a similar one on the setting-shaft, the said setting-drum being graduated relatively to the devices for moving the knees, and suitably scaled to show the distance of the knees from the saw at all times, and also to enable the knees to be
35 set so that any given size of lumber can be cut from the log or cant, leaving the last piece that remains on the carriage after all others have been cut off of a size or thickness the
40 setter may have adjusted for at the commencing of the setting up of the cant; also, to enable the setting to be done quickly, and to secure perfect accuracy of movement of the knees, and to save time by allowing the setter
45 to make all calculations and do most of his work while the saw is cutting, all as hereinafter fully described.

Reference is to be had to the accompanying drawings, forming part of this specification, in
50 which similar letters refer to similar parts in all the figures.

Figure 1, Sheet 1, represents a top view of my improved set-works. Fig. 2, Sheet 2, is a sectional view of the same. Fig. 3, Sheet 3, is a back view. Fig. 4, Sheet 4, is a perspective view of my set-works, showing the
55 position which they occupy on the carriage. Fig. 5, Sheet 5, is a detail of the linear circumferential scale with which the setting-drum is provided, and also the stop-gage and
60 setting-lever. Fig. 6, Sheet 2, is a detail of teeth of rose-clutch drawn to size. Fig. 7, Sheet 4, is a detail of leaf-spring, showing the manner in which it is attached to the frame of
55 set-works, also the position it occupies in relation to the setting-lever and clutch. Fig. 8, Sheet 4, is a detail of end of leaf-spring. Fig. 9, Sheet 4, is a detail of end of setting-lever. Fig. 10, Sheet 4, is a cross-section of setting-lever, showing how the spring is connected to
70 same.

Within a suitable frame, A, fitted on the carriage frame or timbers B, and having the set or feed shaft C passing through its sides at D, I arrange a drum, E, on the set-shaft C
75 and keyed fast to it, which drum has one edge of its rim fitted with rose clutch-teeth F, set for turning the drum forward to set up the log to the saw by the clutch-drum G, having the edge of its rim next the drum E correspondingly toothed, and being attached to the
80 setting-lever H and fitted to turn loosely on the setting-shaft C, and having a spring, I, that presses it forward into engagement with the teeth of the drum E when said drum is
85 to be turned forward for setting the log, and allows the teeth to escape when the lever is pulled back for a starting-point for setting. The other edge of the drum E has a similar row of teeth, J, but pitched in the opposite
90 direction, and is provided with a clutch-drum, K, correspondingly toothed, and being free to slip out and into connection with the teeth J to allow the drum E to be turned forward, but being held against rotation by the lips L, which
95 engage with the frame A for effectually holding the drum E against any back play by slackness of any of the parts or by thrusts of the log on the knees M, by the jar of the mill, friction of the saw, or by the log-turner, thereby
100 insuring a perfect uniformity of the thickness of the lumber sawed. The great number of

teeth F J give a large bearing at a distance from the shaft C that gives the greatest strength for resisting said shocks or thrusts.

The lips L are cast on the drum K and slip on the top of the frame A, allowing the drum K to be thrust back by the teeth of the drum E when it turns forward, and the spring N shifts the clutch forward into connection with the teeth on drum E.

10 The drum E has a scale, O, suitably graduated to show by the gage P the movements of the knees in inches and fractions thereof, said knees being moved by pinions on shaft C, geared with racks of the knees. (Not shown, but well understood.)

15 In this example one revolution of the drum E causes the knees M to move fifteen inches, and said drum is spaced and marked accordingly to represent inches and fractions thereof for a setting-scale, O. When the line 15 on drum E stands at the edge of the gage P, the knees M are understood to be fifteen inches from the saw, and each forward movement of the drum one line will advance the knees one inch toward the saw. The gage P also forms a stop for the lever H at Q when setting up the log to the saw. The clutch-drum G is also scaled for a distance of four lines, the length of its range, similarly to the scale of the drum E.

30 The setting-lever H is attached to drum G at a distance representing one-quarter of an inch (more or less) back from the zero-line of its scale to allow for the kerf.

35 To enable the setter to more readily set up large logs or heavy cants, and to provide a way for running the knees quickly back to receive another log to be sawed, I provide a combination of springs and levers as follows: I attach, by means of adjustable bolts, a large stiff leaf-spring, T, to the frame A at U. The small end of this spring, Fig. 8, is fitted on one edge with a lip, W, that engages with the lever H at V, when so desired by the setter.

45 The other side of said spring is provided with a hole or link, X, for attaching a chain, Y, for the purpose of drawing the spring forward to secure strain on same, for purposes described.

50 The setting-lever H is provided with a slot, V, in which is a sliding rod, *a*, which either prevents the lip W of spring T from engaging with lever H by its being shoved downward or allows it to so engage by being pulled up, said lever H at V having rounded edges, over which the lip W may slip.

60 Across the top of frame A is placed a flat cross-piece, A². To this is attached a rising cross-piece, *b*, which forms a suitable bearing for the chain-shaft *c*, another bearing for said shaft being formed in cross-piece A². Through the bearings in cross-piece A² and cross-piece *b*, I place a shaft *c*. On one end, at a convenient height for the setter, I place a hand-wheel, *e*², for the purpose of straining the spring, as heretofore described. Immediately under the

cross-piece *b* the rod *c* is fitted to receive the chain Y. Below this and over the cross-piece A² is a brake-wheel, *d*, keyed fast to shaft *c*. This brake-wheel is provided with a band, which holds shaft *c* from turning backward, after the setter lets go the hand-wheel *e*², by the setter pressing on the pedal *f* with his foot. This pedal, through the levers *g* *h* and pins *i* *j*, tightens the band on the wheel *d*. On the end of shaft *c*, below cross-piece A² and above shaft C, is a bevel-gear, *k*, Sheet 2, fitted to mesh with a similar gear, *l*, on shaft C, but held up out of connection by a coil-spring, *m*, said gear sliding on a feather-key on shaft *c*, and admitting of being pushed downward into connection with gear *l* by means of lever *n* and finger *o*, for the purpose of running back the knees.

When the setter desires to set, say, for a two-inch plank, he draws back lever H, Fig. 5, so that the scale of drum G at the stop P reads "2," and the line S of drum G traverses the scale of drum E a distance representing two and one-quarter inches. This he does while the saw is cutting off the slab or board that has been set up before. Then when the carriage is giggered back for another cut, he shifts the lever H forward until it is stopped by the gage P at Q. This sets the log two and one-quarter inches, and similarly he sets one-quarter more than is required for any thickness to allow for the saw-kerf. When band-saws or saws cutting out less than one-quarter for kerf are used, the distance between the lines R S is reduced to conform with the thickness required to three-sixteenths, one-eighth, or one-sixteenth of an inch.

The clutch-drum G is provided with a collar, S, Fig. 2, which is connected to the arm *t* and lever *n* by a projection of said arm and lever into a groove of the collar S. The arm *t* is in turn connected to the arm *u* by a slot and pin, *v*. The other end of arm *u* is connected in like manner to the collar of drum K, and has fastened to it near its extremity a bar, *a*², connecting it to lever *c*², so that the ratchet-drums G K can be readily disconnected from the setting-drum E, and the gear *k* thrown into connection with the gear *l* by pulling lever *c*² over whenever it is required to run back the knees to receive another log. This can be accomplished in two ways: first, by the setter simply twisting or turning the shaft *c* by means of hand-wheel *e*², gear *k* and *l* meshing together; second, before pushing over lever *c*² the setter gives the hand-wheel one or two turns, or more, as in his judgment may be needed, winding chain Y on the shaft *c*, and putting a strain on the leaf-spring T. Before letting go the hand-wheel he places his foot on the pedal *f*. This holds the shaft from being turned back by the strain of the spring T. This he does while the saw is making its last cut, so that the instant the dogs let go the last board he can, by releasing the brake by his foot, allow the spring to run back the knees

to any required distance and be ready for the next log by the time the carriage is giggered back.

There are often large and heavy logs that it is impossible for one man to set up through the means of simple levers before described; so to enable the setter to accomplish this alone I use the spring the same as for running back the knees, only, of course, the bevel-gear is not in connection. The setter draws back lever H for the amount he wants to set, and at the same time lifts the rod *a*. This opens a slot, V, in the side of the lower end of said lever. Then the setter turns the hand wheel, drawing the end of the leaf-spring over until the projection W on its side engages with the slot V in lever H. He now holds pedal *f* down with his foot until the proper moment arrives for which to make the set. Then lifting his foot from the pedal, the spring, which is very stiff, gives him a power for throwing forward the lever H equal to three or four men or more, as the parts may be arranged and according to the size and stiffness of the spring T. It is a well-known fact that the speed of the sawing is often retarded by the difficulty experienced by the setter in setting up heavy logs with a single-acting lever, and the same difficulty is encountered—that of lost time—by double-acting levers that require just as many motions on small light logs as on heavy ones. I have so arranged this that one is independent of the other, so that the setter has the necessary help on large heavy logs, and is not bothered by making useless motions in setting small light logs.

By repeating the figures of the circumferential scale O of the setting-arm E, as shown on the left-hand margin of the same, said scale answers to show, by the gage P, the distance of the knees back from the saw in the second and third turns backward of the drum E.

For enabling the knees to be set at the beginning of the cutting up of the log so that the last board or plank remaining on the blocks after the others have been cut off will be the same thickness or any given thickness the setter may desire, and to save a large amount of mental calculations on his part, I have provided a scale consisting of a series of circumferential lines, E², Fig. 5, which are spaced and marked for the specified thickness indicated by the figures on gage P, so that by moving the setting-drum forward so that it moves under the gage from any one point to another on the same line the knees will be moved the distance indicated by the figure on the gage P over said line, and also a distance equal to saw-kerf in each instance so moved, the spacing commencing with the distances indicated by figures on gage P back from the saw on each line, so that by selecting any line that corresponds to any thickness required for the lumber and setting its mark up to the gage P, and thereafter setting up to the next mark each time, the last board or plank

will be the thickness indicated on gage P over said line.

The arrangement allowing the lever *h* to be drawn back while the saw is cutting allows the setter to make all calculations before the carriage is giggered back, so that when the sawyer is ready for another cut he has only to wait for the setter to make one upward thrust of the setting-lever for any thickness up to four inches, while in other setting apparatuses the sawyer has to wait for the setter to make several motions, as before described.

The scale E² on the right side of drum E is duplicated on the left, except as regards the spacing of lines, it being spaced with reference to the second turn backward from the saw, the first being spaced from one to fifteen, and the next from fifteen to thirty, inches. This may be again duplicated for the third turn, or from thirty to forty-five inches. This scale enables the setter to see instantly just how many inches and fractions of an inch the knees are back from the saw at all times.

Having described my invention, that which I now claim as new, and desire to secure by Letters Patent, is—

1. The combination of a saw-mill carriage, its knees, and knee-setting shaft C, geared to said knees, with a drum, E, keyed fast to said shaft, a drum, G, free to move forward and back on said shaft and carrying a setting-lever, H, a drum, K, on said shaft C, held from rotation by projections engaging with a frame surrounding the three drums and fitting on said shaft loosely enough to allow its being rotated, the drum E being toothed in the entire circumference of both sides or rims in the form of a rose-clutch, the teeth of both sides pointing backward, said teeth being equal in size, so that lines formed across its face between opposite teeth can be figured to indicate the distance of the knees from the saw, the said drum G being on one side of the drum E and toothed on its connecting edge or rim with the teeth pitched forward, so as to engage with the teeth of drum E, for the purpose of rotating the set-shaft *c* forward, but being itself free to be turned backward for a new forward movement, the said drum K being on the opposite side of drum E, toothed on its connecting rim, the teeth being pitched forward, allowing drum E to be rotated forward, but holding it from any backward movement, all substantially as described.

2. The combination of a saw-mill carriage, its knees, and knee-setting shaft C, geared to said knees, a double rose clutch-drum, E, keyed to said shaft, a setting rose clutch-drum, G, and a holding rose clutch-drum, K, mounted loosely on said shaft C, one on each side of drum E, with two coil-springs, one outside of each drum K and G for the purpose of holding said drum into clutch with drum E, an upright lever, *c*², connected at its lower end to the frame of the carriage inclosing said drums K E G, also connected at a suitable distance

from its lower end with a horizontal right-angled arm, *t*, said arm being in contact at one end with drum K, being pivoted on the carriage-frame at its angle and attached at its other end to a similarly-constructed arm, *u*, said arm pivoted on the carriage-frame at its angle and coming in contact at its other end with the drum G, said lever and arms being for the purpose of temporarily disconnecting drums K and G from drum E, all substantially as described.

3. In a saw-mill carriage, the combination of its knees, and knee-setting shaft C, geared to said knees, with a bevel-gear, *l*, keyed fast to said shaft C, a vertical or upright shaft, *c*, supported by frame-work on said carriage, the shaft *c* having on its lower end, mounted on a feather key, a bevel-gear, *k*, held up a short distance by a spring allowing of its being depressed into connection with bevel-gear *l* on shaft C, said shaft *c* having on its upper end a hand-wheel, *e*², an upright lever, *c*², attached at its lower end to the frame of the carriage and being connected by a series of arms, *t u*, and a rod, *n*, to a finger, *o*, said finger being so supported on the frame-work of the carriage that by moving lever *c*² the finger *o* depresses the bevel-gear *k* into connection with bevel-gear *l* on shaft C for the purpose of receding the knees, all substantially as set forth.

4. The combination, in a saw-mill carriage, of the knees, and knee-setting shaft C, geared to said knees, with a semicircular leaf spring, T, fastened at its commencement to a frame-work of the carriage outside the set-shaft C, said spring extending down under said shaft, its free end coming up on the opposite side, a vertical or upright shaft, *c*, mounted on the frame-work of the carriage, said shaft *c* having on its upper end a hand-wheel, *e*², and on its lower end mounted on a feather key, a bevel-gear, *k*, held up a short distance by a spring, a chain or rope, Y, connecting said spring T to said shaft *c*, a bevel-gear, *l*, keyed fast to set-shaft C immediately under gear *k*, a lever, *c*², connected to a finger, *o*, by the arms *t* and *u* and rod *n*, said finger being so supported upon the frame-work that by moving lever *c*² the gear *k* will be depressed by it into connection with gear *l* on set-shaft C for the purpose

pose of receding the knees, said shaft *c* having also fastened to it a brake-wheel, *d*, encircled by a friction-band, said band being connected at one end to the carriage frame-work and at the other to a pedal, *f*, by suitable rods for the purpose of controlling the action of the spring T, all substantially as and for the purpose described.

5. The combination, in a saw-mill carriage, of its knees, knee-setting shaft C, geared to said knees, with a double rose-clutch feeding-drum, E, keyed fast to said shaft, a single rose-clutch holding-drum, K, mounted loosely on said shaft on one side of drum E and secured from rotation by projections from it to the frame-work of the carriage, a setting rose-clutch drum, G, mounted loosely on said shaft C on the opposite side of drum E, free to be moved backward and forward and clutching with drum E in its forward movement, thereby advancing the knees, a lever, H, attached to drum G, said lever being at right angles to shaft C, being rounded on its outside and provided with a longitudinal slot in the center of the rounded portion, and a rod, *a*, sliding in this slot so that it may be closed or opened at will of operator, a heavy semicircular leaf spring, T, fastened at its commencement to the frame-work of the carriage, its free end describing a curve parallel and similar to the rim of drum G, said spring having a projection, W, on its free end suitable for engaging with the slot in lever H, a vertical or upright shaft, *c*, mounted on the carriage-frame, said shaft having on its upper end a hand-wheel, *e*², and also having a brake-wheel, *d*, encircled by a friction-band, said band being fastened at one end to the frame work and connected by its other end to a pedal, *f*, by suitable rods, a chain or rope, Y, connecting the free end of the spring T with the shaft *c*, a stop gage, P, mounted on the frame-work of the carriage for arresting at a certain point the forward movement of lever H, all substantially as and for the purpose described.

A. IRWIN LOOP.

Witnesses:

DYER LOOMIS,

ADDISON H. HILLS.