

2 Sheets. Sheet 1.

E. P. Irons,

Reciprocating Saw Mill.

N^o 55,497.

Patented June 12, 1866.

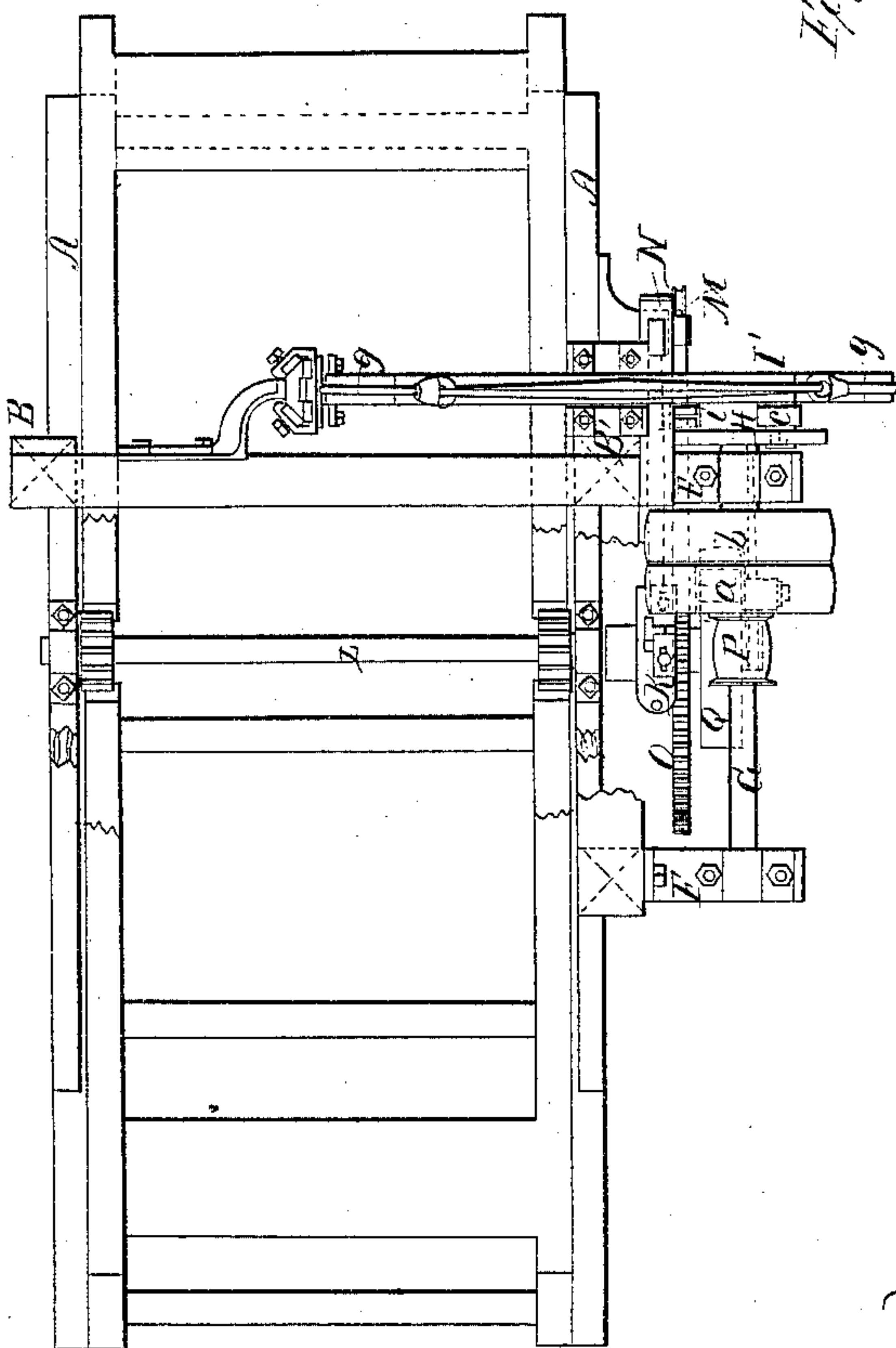
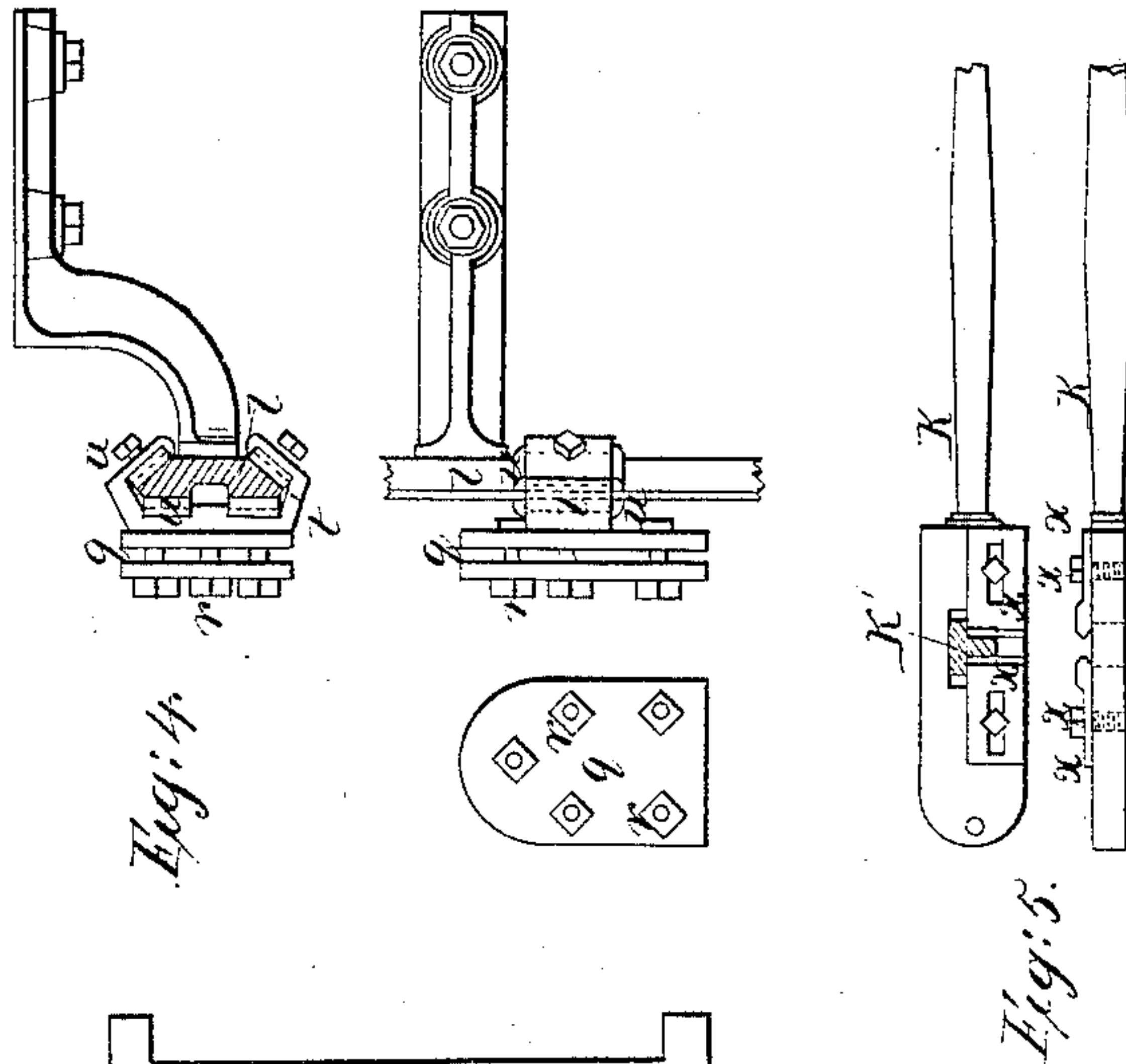


Fig: 1.

Witnesses;
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C. D. Smith

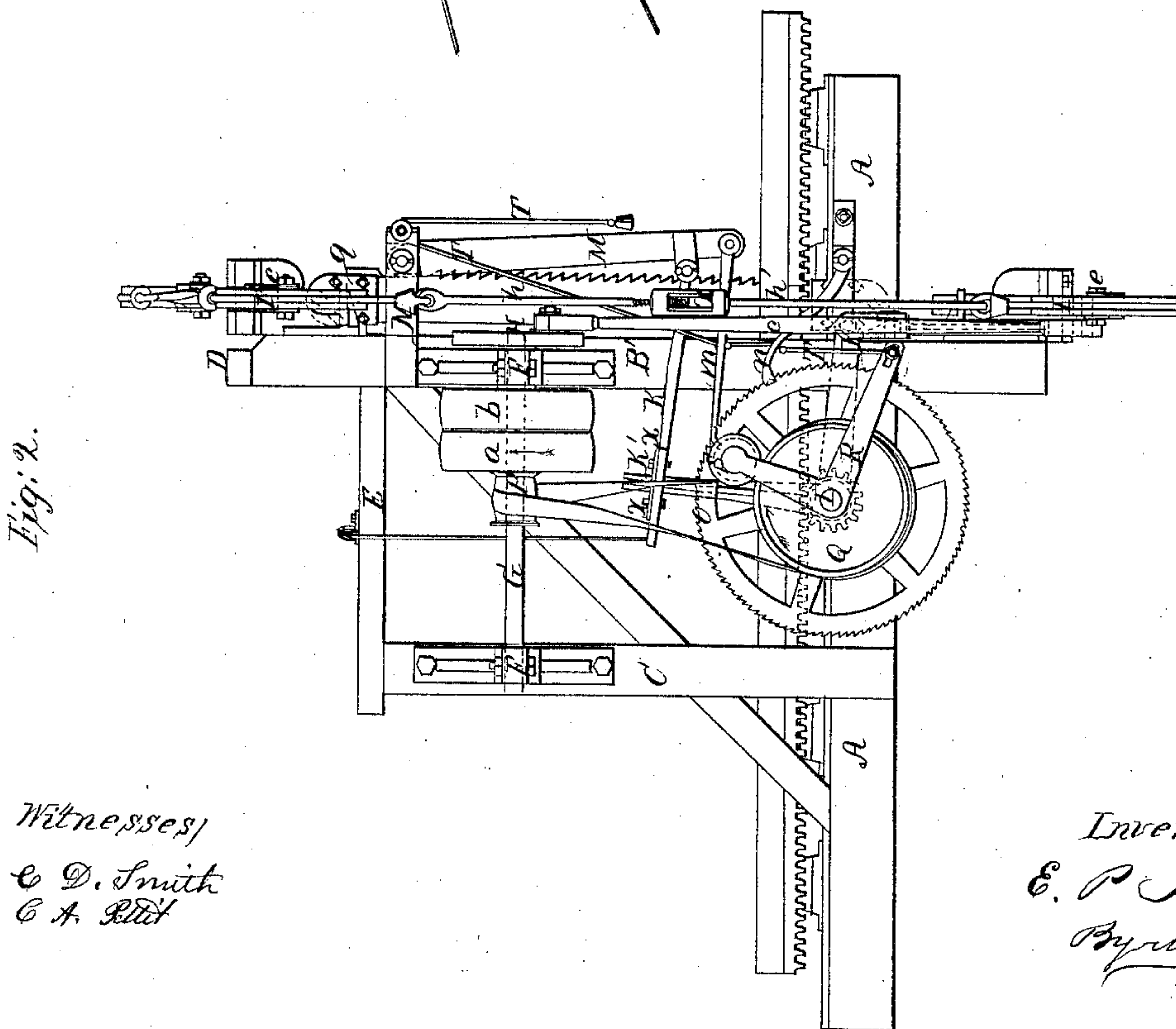
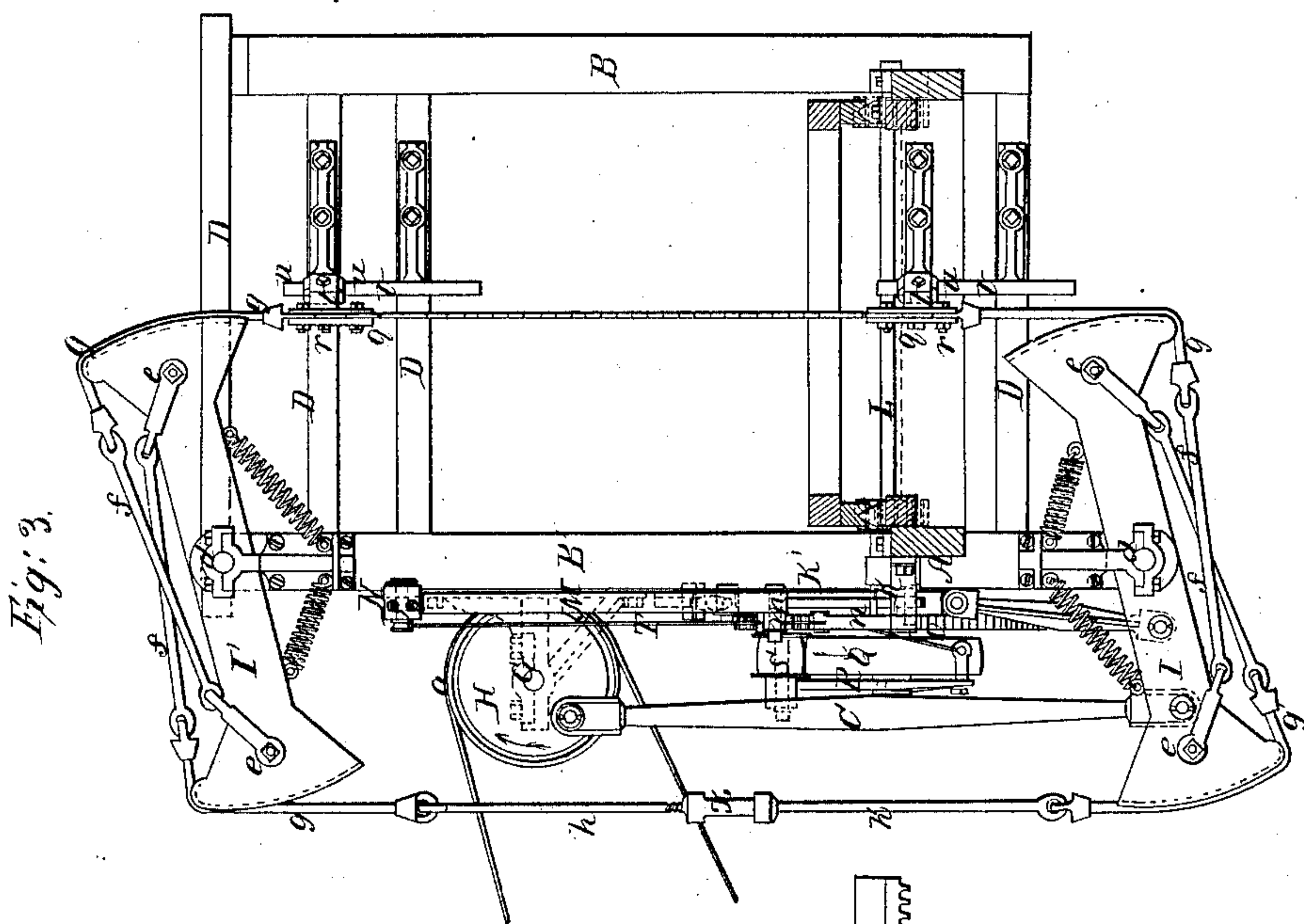
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UNITED STATES PATENT OFFICE.

E. P. IRONS, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN SAW-MILLS.

Specification forming part of Letters Patent No. 55,497, dated June 12, 1866.

To all whom it may concern:

Be it known that I, EDWARD P. IRONS, of Baltimore, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Portable Upright Saw-Mills; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a plan or top view of my saw-mill. Fig. 2 is a side elevation thereof. Fig. 3 is an end elevation, and Figs. 4 and 5 show parts in detail.

Similar letters of reference indicate corresponding parts in the several figures.

A A are the timber-beds of my saw-mill, having the uprights B, B', and C, with their cross-ties D, D, and E firmly braced to them, the whole forming a frame-work of the strength necessary to insure stability while the saw is performing its office.

The journal-boxes F F on the uprights B' and C support the bearings of the shaft G. This shaft has motion given it by a belt from the driving-power around the fast pulley *a*, which belt may be shipped by any common device to the loose pulley *b* on the same shaft when it is desired to stop the work of the saw without checking the driving power or force. On one end of this shaft G is a crank-plate, H, giving motion, through the connecting-rod or pitman *c*, to the walking-beam I, which vibrates on a center in the journal-box *d*, bolted to the lower end of the upright B'. Another walking-beam, I', similar to the first, is hung at the journal-box *d'*, attached to the upper end of the upright B'. The ends of these walking-beams are arcs of circles having the journals *d d'* for their centers. From near each end of the walking-beams, where they are attached by bolts *e*, extend tension-rods *f f'* toward the opposite ends of the beams, where they are hooked into twisted wire cords or bands *g g g' g'*, which pass over the circular ends of the walking-beams and fall into grooves therein like the groove in a sheave or pulley. The wire cords or bands *g g* are attached one to the upper and the other to the lower end of an upright saw, the blade of which is tangent to the curves on the ends of both walking-beams, and is extended verti-

cally between them. The other cords or bands *g' g'* are attached to tension or straining rods *h h'*, one, *h*, extending down from the upper walking-beam, I', and terminating in a screw, and the other, *h'*, extending up from the lower beam, I, and having a swivel turn-buckle, X, which takes the screw on the upper straining-rod, *h*. This arrangement allows the beams I I' to be made much lighter than they could otherwise be, furnishes the means of straining the saw as tight as may be desired by turning the turn-buckle, while the flexibility of the wire cords or bands over the ends of the beams allows these to vibrate on their centers with perfect freedom and always parallel.

Spiral springs, or some equivalent device, are attached to the walking-beams, as shown distinctly in Fig. 3, for the purpose of gradually checking momentum and preventing anything like jerking or pounding while the saw is in rapid motion.

A connecting-rod, *i*, is jointed to the lower walking-beam, I, and at its upper end is linked to the end K of the bell-crank lever K K', having its fulcrum on the feed-shaft L, (shown in red in Fig. 2.)

The arm K' of the bell-crank in its cross-section is of the form of a cross, or T-shaped, to give it stiffness and make it light, and is received by an opening in the end of the connecting-rod *k*, which it moves in its vibration. This opening is armed by steel plates *x*, Fig. 5, made adjustable to compensate for wear and to take up lost motion. The other end of the connecting-rod *k* is jointed to the lever M, having its fulcrum at *l* on the arm N, attached to the upright B' near its upper end.

The lever M carries at its lower end and gives, by its vibration, reciprocating motion to the feed-hand *m*, which, in turn, pushes round the rag-wheel O, fast on the feed-shaft L, a detent or pawl, *n*, serving to keep the rag-wheel O from turning back after being moved by the feed-hand.

The shaft L has its bearings on both the bed-timbers A A of the mill, and carries two pinions, (shown in red in Figs. 2 and 3,) which pinions take into racks on the under side of the rails of the log-carriage, and by their revolution cause the log-carriage to be moved, so as to feed the log to the saw.

The steel-armed end of the connecting-rod *k* can be dropped down upon the ribbed arm *K'* of the bell-crank, so as to be near the shaft *L*, or it can be lifted up to the extreme end of *K'*, by means of a cord or chain under the control of the mill-tender, the distance from the shaft *L* that it is operated by the arm *K'* of the bell-crank, regulating the amount of feed at each stroke of the same. Thus, if a log of soft wood be under operation, the connecting-rod is lifted up toward the end of the arm *K'* to give the longest desirable stroke to the feed-hand of the ratchet through the lever *M*; and now, if a hard, flinty knot comes against the saw, it will be expedient to lessen the feed, which is done immediately by dropping the armed end of the connecting-rod *k* down on the arm *K'* as near the shaft *L* as may be necessary to cause the feed-hand to move the rag-wheel a sufficiently short distance.

On the shaft *G* is a small pulley, *P*. A belt from this passes loosely around the pulley *Q* on the feed-shaft *L*. A bent lever, *R*, having its fulcrum on the feed-shaft *L*, carries at one end a friction-pulley or rider, *S*, and at the other end has a cord or chain, *T*, to govern its movement, which is carried in a direction to be under the control of the mill-tender. The cord may be attached also by hooks, or their equivalents, to the detent *n* and the feed-hand *m*, so that when it is desired to run the log back from the saw a pull upon the cord *T* will lift the feed-hand and pawl free from the rag-wheel, and will also raise the lower end of the bent lever *R*, forcing the rider *S* to tighten the belt around the pulleys *P* and *Q*, so that motion will be given to the feed-shaft in a direction contrary to that which it had when moved by the ratchet. The arrows indicate the direction of the revolutions while the log-carriage is being run back from the saw.

The log-carriage can be arranged to disengage the feed-hand and pawl and cause itself to be run back at the conclusion of every cut by any of the common and known devices for that purpose.

To the cross-ties *D D*, connecting the upper ends of the uprights *B B'*, and to the cross-tie connecting the ends of the bed-timbers *A A*, are secured by bolts the guides *U U* for the

slides at each end of the saw. The end of the saw is embraced between two plates, forming a stirrup, *q q*, through which and the saw screw-bolts *r r* pass and are secured by nuts. The wire cord *g* is firmly attached to the stirrup a short distance from the end of the saw. To one of the plates *q*, (and forming, if necessary, one piece with it,) are attached the jams *t t*, embracing the edges of the guides *t*, and having gibbs *u u*, adjustable by means of set-screws, so that they may slide freely yet be perfectly tight upon the guides *U*.

Having thus fully described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The described mode of connecting the elastic saw-bands *g g'* to the walking-beam by rods *f f'*, attached at points *e* at the opposite ends of the beam from that upon which the said bands *g g'*, are lapped, substantially as described.

2. The manner, substantially as herein described, of attaching the flexible wire cords or bands to the ends of the saw by means of the stirrups *q*, in combination with the jaws *t t*, the adjustable gibbs *u u*, and guides *U*, the parts arranged and operating substantially in the manner and for the purpose set forth.

3. The combination of the connecting-rods *i*, bell-crank *K K'*, graduating connecting-rod *k*, lever *M*, feed-hand *m*, rag-wheel *O*, and shaft *L* with pinions and racks, arranged and operating substantially as and for the purpose set forth.

4. The manner of graduating the length of the cut or feed by means of the graduating connecting-rod *k*, moving up and down on the arm *K'* of the bell-crank lever, so as to be moved a long or short distance, for the purpose and substantially in the manner set forth.

5. The combination of the adjustable steel arming-plates *x* with a connecting-rod, *k*, arranged and operating as herein set forth, for the purpose of compensating for wear and allowing lost motion to be readily taken up, as set forth.

EDWARD P. IRONS.

Witnesses:

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