

(No Model.)

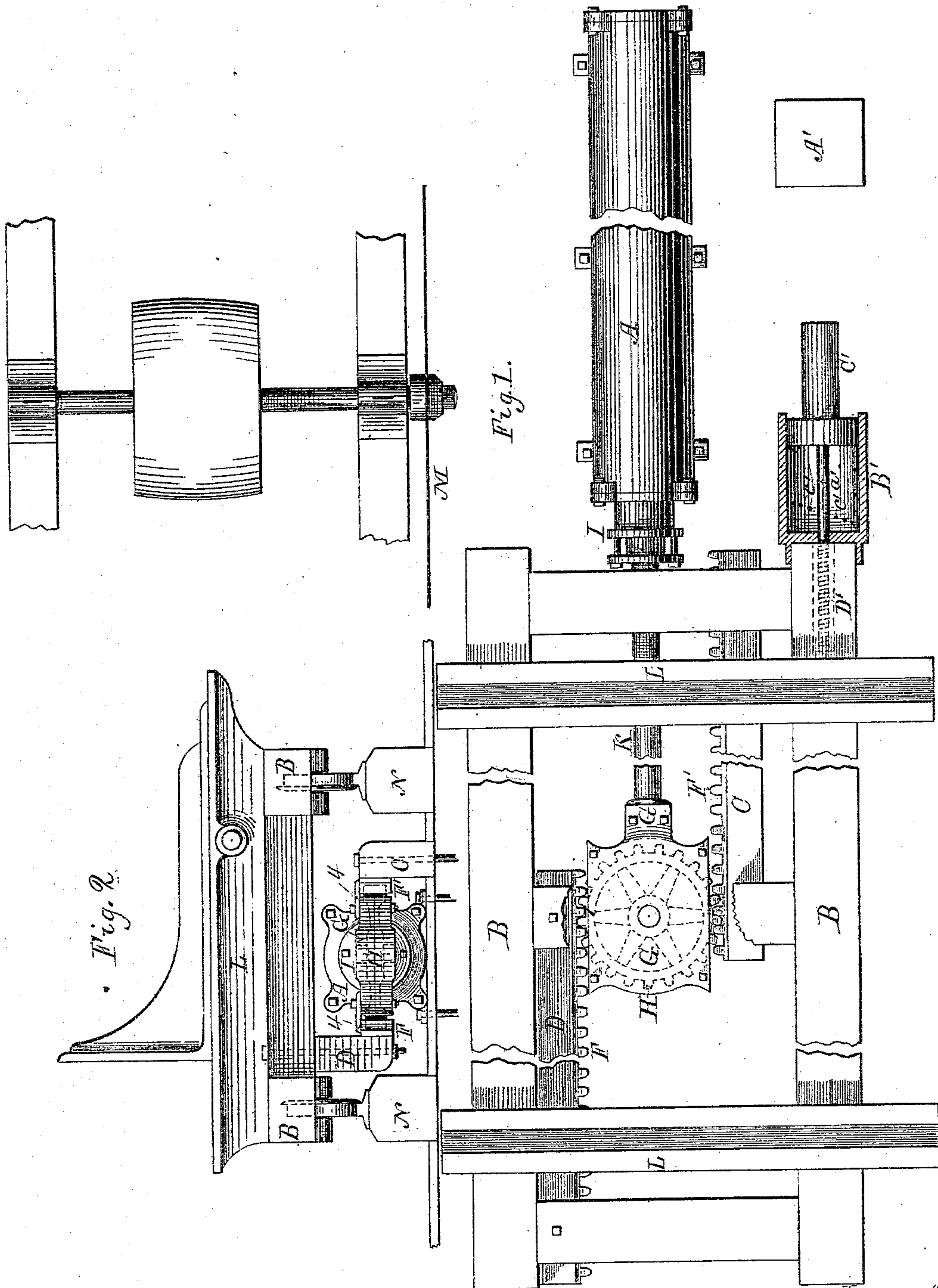
2 Sheets—Sheet 1.

A. CUNNINGHAM.

STEAM FEED WORKS FOR SAW MILLS.

No. 274,568.

Patented Mar. 27, 1883.



Witnesses:
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F. H. Bottom

Inventor.
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Attorney.

(No Model.)

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Fig. 3.

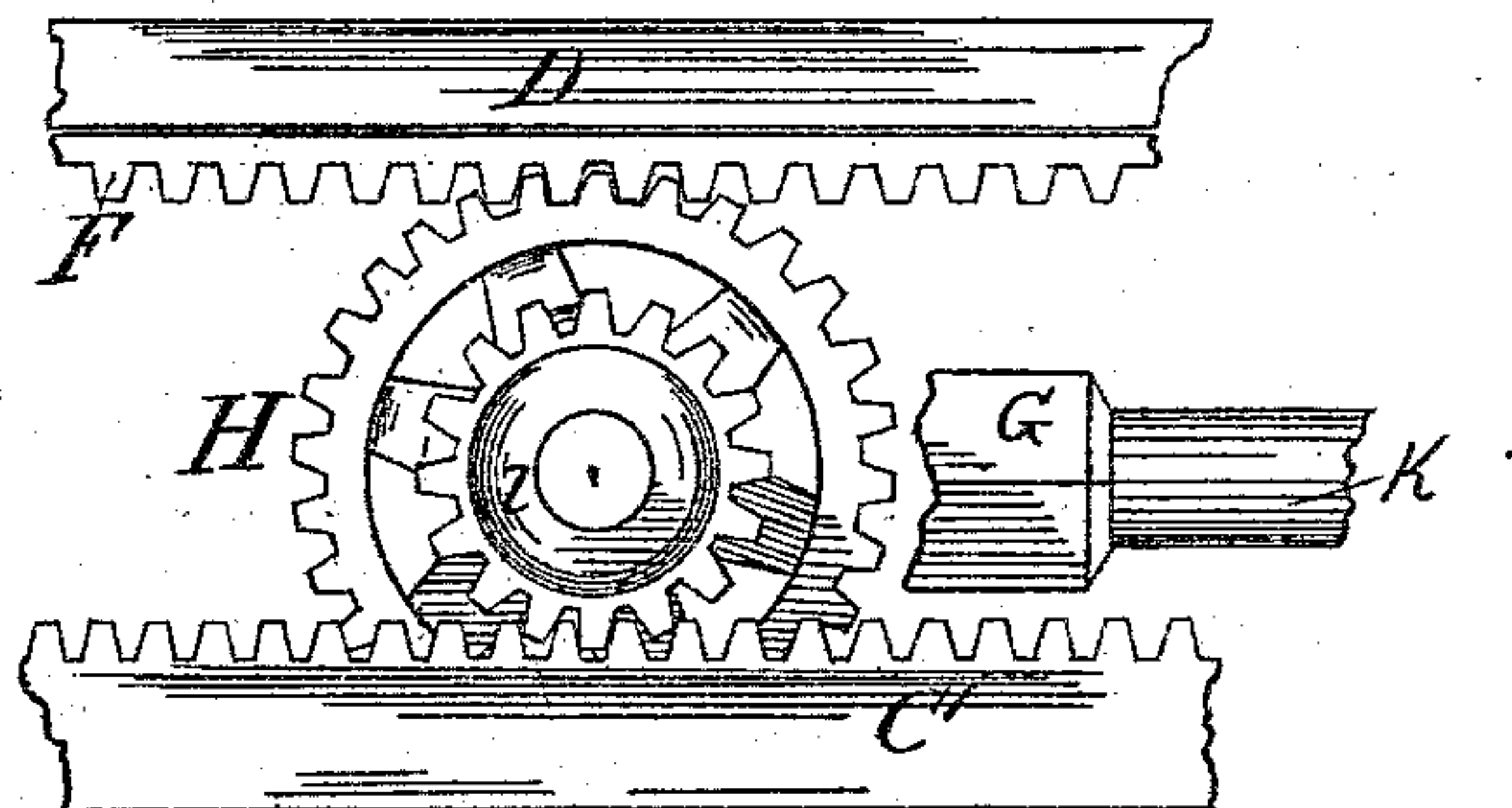
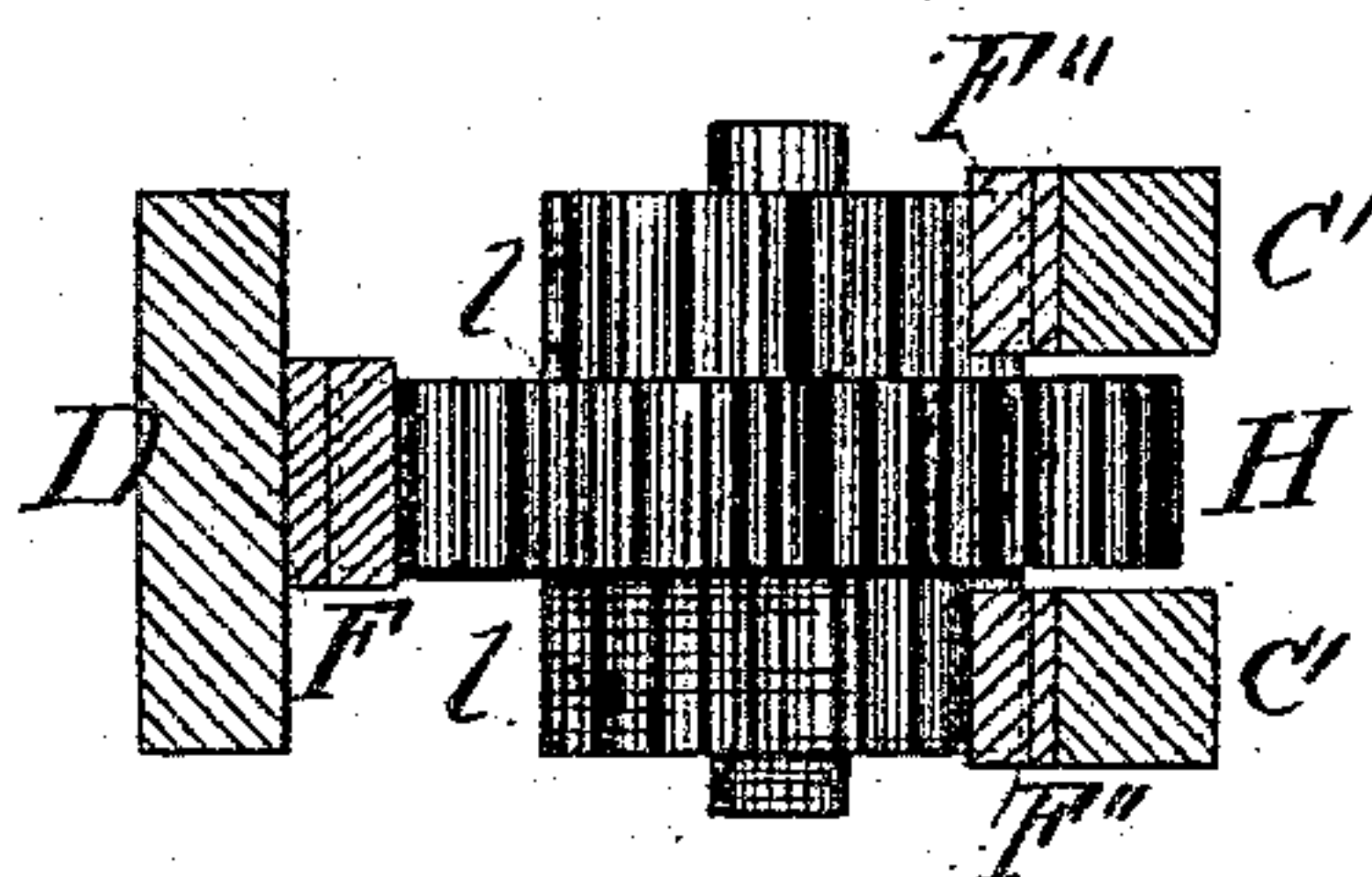


Fig. 4.



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UNITED STATES PATENT OFFICE.

ALBERT CUNNINGHAM, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO JOHN M. STOWELL, OF SAME PLACE.

STEAM FEED-WORKS FOR SAW-MILLS.

SPECIFICATION forming part of Letters Patent No. 274,568, dated March 27, 1883.

Application filed March 29, 1882. (No model.)

To all whom it may concern:

Be it known that I, ALBERT CUNNINGHAM, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Steam Feed-Works for Saw-Mills; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to that class of devices which are employed to move the carriage backward and forward in circular saw mills, and which are usually denominated "feed-works."

It consists essentially in the means employed for transmitting the movement of a steam-piston to the carriage and multiplying its motion by means of one or two simple gears; and it is designed to dispense with the cumbersome and complicated combinations of gears, frictions, and belts which have heretofore been commonly employed, and at the same time to avoid the evils encountered in the direct application of steam to the movement of the carriage.

In the accompanying drawings, Figure 1 is a plan view of the cylinder, carriage, and connections, showing the saw also. Fig. 2 is an end elevation of the same. Fig. 3 is a view of the connecting-gear, of a slightly-modified form, on an enlarged scale. Fig. 4 is an end elevation of the parts shown in Fig. 3.

Similar letters denote like parts throughout all the figures.

For completeness, and that my invention may be better understood, I have delineated in the drawings more than I claim upon this application. The parts not claimed I design to claim in an application to be filed hereafter.

A is a steam-cylinder, which is firmly attached to the floor-timbers 1 1 of the mill, underneath the carriage, between the ways on which it travels, and parallel thereto. The cylinder is never made of a greater length than sufficient to allow the piston to travel one-half the distance traveled by the carriage, and it may be made still shorter, as will hereinafter be more fully explained. It is provided with

a piston-head, P, and piston-rod K. The cylinder, piston-rod, steam-pipes, and valve-rod are represented with segments of each elided to show the essential parts of each in condensed space. The exterior end of piston-rod K is rigidly attached to a cross-head or gear-case, G, which is provided with a horizontal slot, within which a gear-wheel, H, revolves freely on an axle attached to the cross-head G.

The carriage B B is mounted, in the usual way, upon truck-wheels which travel upon the ways N N, and is provided with head-blocks L L, of the usual construction. M is the saw. A timber, D, is bolted to the under side of the carriage B B, and extends lengthwise underneath it for a distance equal to at least one-half of the required travel of the carriage. On the inside of timber D a vertically-toothed rack, F, is bolted. A timber, C, extends lengthwise of the carriage along the floor of the mill, and is securely bolted to it between the ways N N. Between the ways N N a similar rack, F', is bolted to timber C, as delineated. Plates 4 4, bolted to the cross-head G and overlapping the racks F and F', as shown in Fig. 2, serve as covers for the gear H, and also as guides or supports for the cross-head G. The cylinder A is located between the timbers C and D, and the opposite sides of the gear-wheel H mesh into the racks F F', as shown in Fig. 1.

Instead of employing a single gear H, as shown in Figs. 1 and 3, I may employ a double gear, as shown in Figs. 4 and 5, wherein two smaller gears, l l, are cast with or firmly attached to the upper and under sides of H, and are concentric therewith. The smaller gears l l mesh into racks F'' F'', which are attached to a timber, C' C', secured in the position occupied by timber C, and longitudinally slotted to permit the free passage of gear H. The gear H meshes with rack F, as before. This construction I design to use whenever it is desired to employ a cylinder less than half as long as the required movement of the carriage.

In order to provide an elastic stop for the movement of the carriage, I construct a short air-cylinder, B', which is attached to the end of the carriage B, as shown in Fig. 1. It is fitted with a piston, C, and that is provided at its inner end with a small piston-rod, a', which, as the piston is pressed toward the inner end

of the cylinder, enters an orifice, D', in the carriage B. A spirally-placed line of small air-holes, c' c', extends through the case of the air-cylinder B'. A block, A', is fastened to the floor of the mill at a suitable position to receive the impact of the piston C' when the carriage reaches its extreme point of movement. The air-holes c' c' permit the slow egress of the air behind the piston as it is pressed in by contact with the block A', and thereby prevent any recoil on the part of the piston, or, in other words, produce a dead-cushion. Since the holes c' c' are placed spirally around the cylinder B', they will be gradually shut off by the movement of the piston-head, and the rate of the passage of the air being diminished, the resistance to the piston will be increased as it approaches the inner end of the cylinder. When the carriage is moved away from contact with the block A' the spiral spring in the orifice D' presses the piston C' to the other end of the cylinder B', the air-holes c' c' permitting the ingress of air behind the piston. This air-cushion is not designed to arrest the motion of the carriage at every movement, but is simply placed as a safeguard against shocks occasioned by the undue movement of the carriage at the end of its journey, and to prevent the carriage from injuring other portions of the mill if it should escape the control of the operator.

My device operates as follows: Steam being admitted to the steam-cylinder A, the piston-rod K is caused to move, and it causes the piston-head P and the gear H to travel the length of a piston-stroke, or any less distance desired to accomplish the required movement of the carriage. As the piston moves outward the gear H meshes upon its opposite sides into both the immovably-fixed rack F' and the rack F, which is attached to the carriage. By this means the fixed rack F' compels the gear H to revolve, and it, in consequence of its revolution, together with its rectilineal movement, through its attachment to the piston-rod K, causes the rack F and the carriage to which it is attached to be moved forward the distance traveled by the piston-rod plus the distance traveled by the gear H on the fixed rack F'; or, in other words, when the construction shown in Fig. 1 is employed, the movement of the carriage B is caused to be double that of the piston-rod K in the same direction. A reverse movement of the piston will of course bring the carriage back to its starting-point.

When the device shown in Figs. 3 and 4 is employed, the small gears l l meshing into the fixed racks F'' F'' and the large gear H into the rack F, attached to the carriage, the carriage will travel a distance equal to the travel of the piston plus the product of the travel of the piston multiplied by the ratio which the circumference of the larger gear, H, bears to the circumference of the smaller gears, l l.

The question whether the construction shown in Fig. 1 or in Figs. 3 and 4 is to be employed is one of convenience, and will depend upon the location and arrangement of the mill and carriage to which it is to be applied, the construction shown in Figs. 3 and 4 obviously permitting the employment of a shorter cylinder than would be required in the use of the construction shown in Fig. 1, though in many cases the construction shown in Fig. 1 would be preferable on account of greater simplicity.

Any desired length of travel can obviously be given to the carriage by the use of a cylinder of any given length by simply proportioning the relative sizes of the gears H and l l properly. A reverse movement of the steam-piston will of course reverse the movement of the carriage.

Instead of placing the air stop-cylinder on the carriage, it may be affixed to the floor, and the carriage caused to strike the piston thereof.

I am acquainted with the device patented by C. Bliven, Patent No. 229,084; but that device differs from mine in employing a main or log-supporting carriage and an auxiliary carriage, while mine employs only the single ordinary log-supporting carriage. Bliven's device cannot be applied to an ordinary saw-mill carriage, while mine can.

I claim—

1. In a steam-feed for saw-mill carriages provided with wheels running on the usual track, the combination of the steam piston-rod K of a steam-cylinder, a revolving gear, H, which is directly connected thereto and travels therewith, a log-carriage, B, to support the log, provided with a rack, F, and the fixed rack F', substantially as and for the purpose set forth.

2. In a steam-feed for saw-mills, the combination of a piston-rod, K, of a steam-cylinder, the revolving gears H and l l, directly connected thereto and traveling therewith, a carriage, B, to support the log, provided with rack F, and the fixed racks F'' F'', substantially as and for the purposes set forth.

3. In feed-works for saw-mills, the combination, with carriage B, of an air stop or cylinder, B', when the same is provided with spirally-located air-orifices c' c' and a piston, C', constructed with a small piston-rod, a', and a spiral spring located in the orifice D', formed in the carriage B, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

ALBERT CUNNINGHAM.

Witnesses:

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THOS. WEIL.