

H. ZELLNER.

Hemp Brake.

No. 66,767.

Patented July 16, 1867.

Fig: 1.

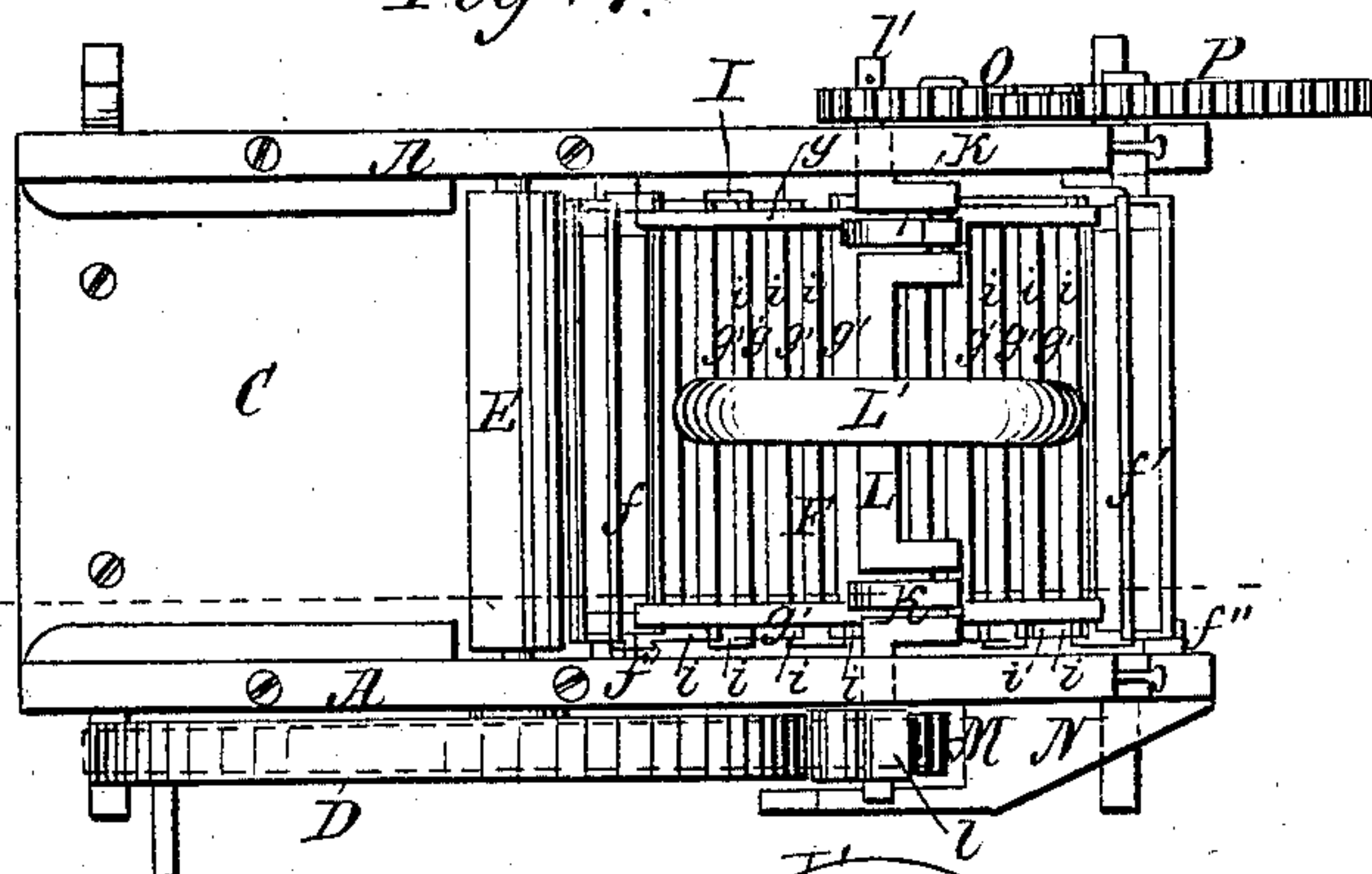


Fig: 2

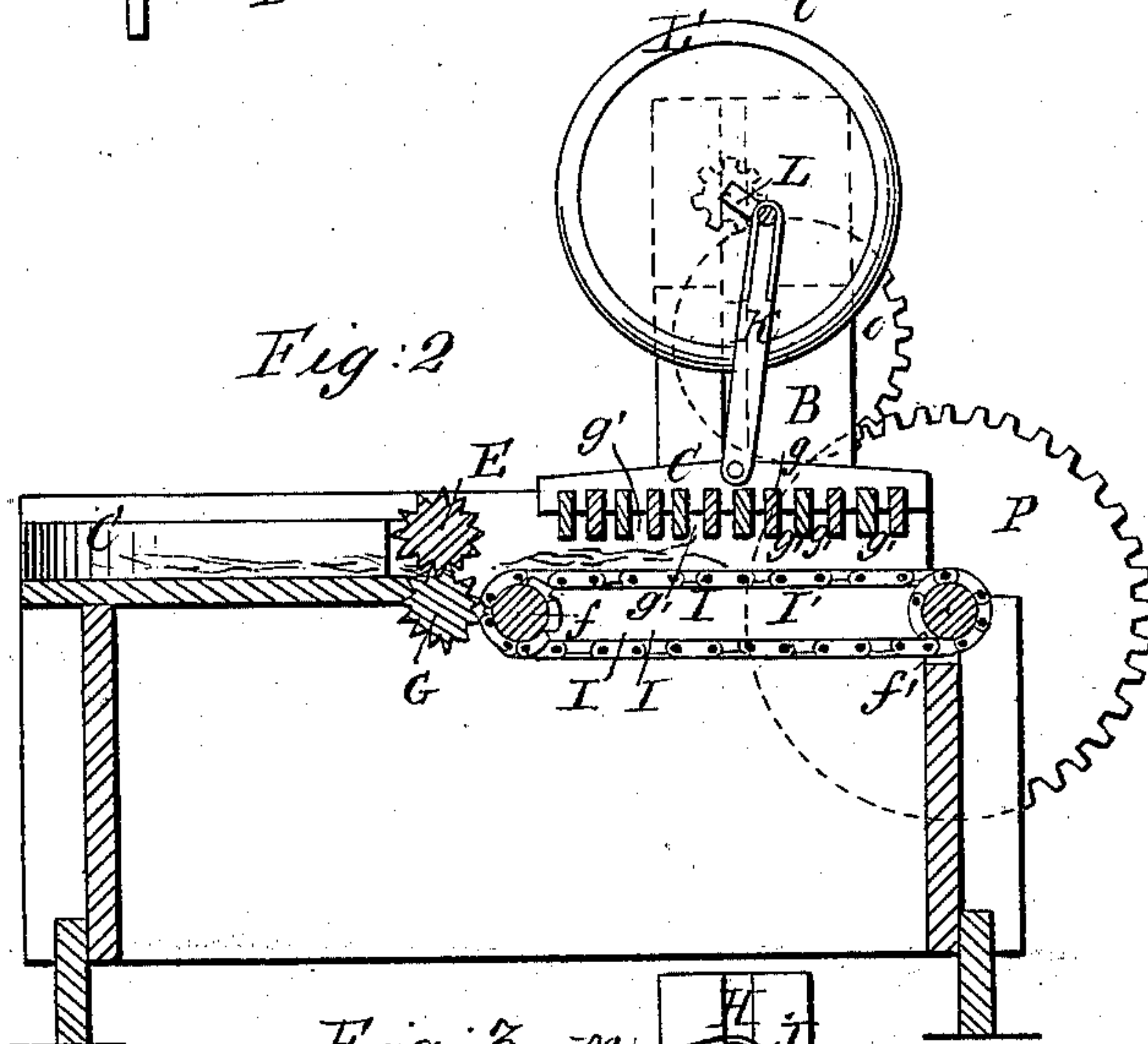
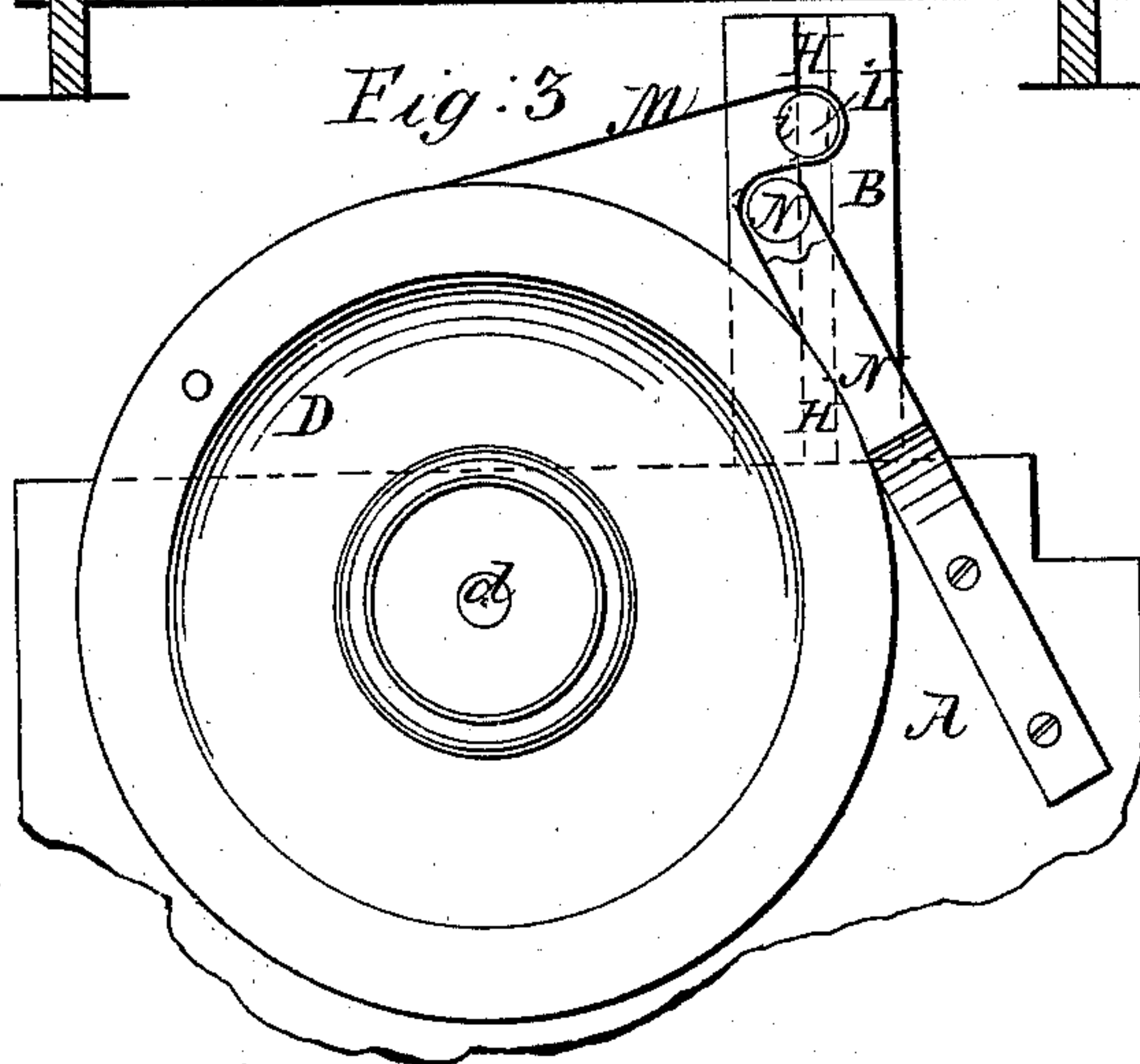


Fig: 3



Witnesses.

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HENRY ZELLNER, OF COLUMBIA, TENNESSEE.

*Letters Patent No. 66,767, dated July 16, 1867.*

## IMPROVEMENT IN BREAKING AND CLEANING HEMP.

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

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, HENRY ZELLNER, of Columbia, in the county of Murray, and State of Tennessee, have invented a new and improved Machine for Breaking and Cleaning Hemp, Flax, &c.; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a top view of my invention.

Figure 2 is a longitudinal vertical section of the same.

Figure 3 is a side elevation of the same.

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

In this invention the endless apron is independent of the feed-rollers, and revolves with a much greater speed. The beater is so arranged and operated that its slats strike between the slats of the endless apron, and thoroughly reduce the hemp or flax.

In order that others skilled in the art to which my invention appertains may be enabled to make and use the same, I will proceed to describe it in detail.

In the drawings, A A represent parts of the frame of my machine; B B', upright posts, which support several parts of the mechanism; C, the feed-table; D, the drive-wheel, working on the shaft *d*, to which is attached the roller *d'*. E is a second roller, working above and in connection with the roller *d'*, and, both together, situated at the forward extremity of the feed-table, constitute the feed-rollers. These rollers are of equal size, and are channelled or grooved along their surfaces, the projections thus formed upon one working like cogs in the depressions upon the other, and communicating the motion of the roller *d'*, received from the driving-wheel, to the companion-roller E. *f f'* are two small rollers, which carry an endless apron, F, extending from the feed-rollers *d' E* to the front end of the machine. The apron F is made of strong slats, *i i*, running directly across the machine, and confined at their ends to endless chains I I, running at the sides of the machine over the extremities of the rollers *f f'*, and along supporting ledges I' attached to the frame A A on its inside. The links of the chains I I may be made of iron, or any other material of sufficient strength, as may also the bars of the apron F. The rollers *f f'* may be provided with rag-wheels, *f''*, if necessary, to give perfect regularity and uniformity to the motion of the apron F. Above the apron thus described is a beater, G, consisting of horizontal side pieces *g g*, connected by parallel slats *g' g'*, corresponding to the slats *i i* of the apron F, and being so arranged that when the beater is depressed sufficiently its slats will enter the spaces between the slats of the apron. Vertical guide-pieces H H are attached to the outside of the pieces *g g*, and run in corresponding vertical grooves on the inside of the posts B B, by which means the beater is steadied and made to ascend and descend always in the same vertical plane. The beater receives its motion by pitmen K K, worked by the double crank-shaft L, which, in its turn, is operated by the belt M, connecting it with the drive-wheel D. N is simply a post and drum fixed to the side of the frame, to give the proper direction to the belt M, to make it exert the greatest power on the pulley *l* of the crank-shaft. L' is a fly-wheel, affixed to the crank-shaft to regulate its motion. At the extremity of the crank-shaft opposite to the pulley *l* is a small pinion-wheel, *l'*, operating, by means of an idle-wheel, O, the cog-wheel P on the end of the shaft of the apron-roller *f'*. The size of these wheels, and of the driving-wheel, must be so graduated that the apron F will move considerably faster than the feed-rollers *d' E*, and that the beater G, vibrating vertically above the apron F, shall rise and fall once while the apron is moving over a horizontal space exactly equal to the distance between the centre of any two adjacent slats *i i* of the apron. By this means the slats *g g*, being situated above the spaces between the slats *i i*, will always strike downward between the slats of the apron, and will rise out of the way while the slats *i i* are passing immediately under the slats *g g*. The feed-rollers *d' E* must be made small, in order to bring the extremity of the apron F as near them as possible.

In a machine thus constructed an important result is secured, by means of the difference in velocity established between the feed-rollers and the apron. In the old machines these parts have the same velocity. The consequence is that the flax is forced through the feed-rollers faster than it can be carried off by the apron. Nothing obstructs the passage of the flax through the feed-rollers, but when it reaches the apron the beater detains it to some extent, and it accumulates in bunches and knots. My machine is designed to obviate this,



and does it perfectly. The apron works so much faster than the feed-rollers, that however the flax may be retarded by the beater, it is carried away faster than it is supplied through the feed-rollers, and can never accumulate on the apron. My arrangement of beater and apron more thoroughly reduces the hemp than any other arrangement now in use. One of the operators will stand by the roller *f'* and receive the mangled hemp after it passes through the machine. The length of the apron can be adjusted to the length of fibre or stock required to be operated upon.

The operation of my machine is as follows: The hemp is fed from the table C through in handfuls between the feed-rollers, and the moment the ends of the stalks pass through the rollers they are caught under the beater, which works close up to the feed-rollers. The slats of the beater strike down upon the hemp, crushing it and bending it down between the slats *i i*. The beater then rises. A few inches of the flax are now stretched on the end of the apron, the rest of it being held between and behind the feed-rollers, and the flax on the apron is bent down between the slats. But the motion of the feed-rollers, which hold the body of the flax, being slower than the motion of the apron, the latter instantly straightens out the bent flax, pulling it up out of the spaces between the slats, and placing it horizontally on the apron again, when it is ready for a second descent of the beater, and the same operation is repeated, and so on indefinitely. In this way the flax is alternately bent and then straightened out, besides being beaten thoroughly in the process. The handful thus fed to the machine having passed through to the operator stationed at the roller *f'*, he takes it from the machine. It is evident that the fibres of the flax will not become crossed or mixed in this process, but owing to the superior velocity of the apron F, pulling at their forward ends, while the slower feed-rollers hold them behind, will always pass straight through, and be delivered in neat bundles, having all the fibres parallel.

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

1. The combination of the beater G, having the slats *g g*, with the endless apron F, having the slats *i i*, substantially as and for the purpose described.
2. The combination of the beater G, pitmen K K, crank-shaft L, idle-wheel O, cog-wheel P, shaft or roller *f'*, and apron F, for the purpose of adjusting the motion of the apron F to that of the beater G.
3. The arrangement of the rapidly-moving apron F, in combination with the slowly-revolving feed-rollers *d' E*, substantially as and for the purpose specified.

To the above specification of my invention I have signed my hand this tenth day of May, 1867.

HENRY ZELLNER.

Witnesses:

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CHARLES A. PETTIT.