

(No Model.)

J. D. HENRY & W. E. WOOD.
FEED MILL.

No. 459,466.

Patented Sept. 15, 1891.

Fig. 1.

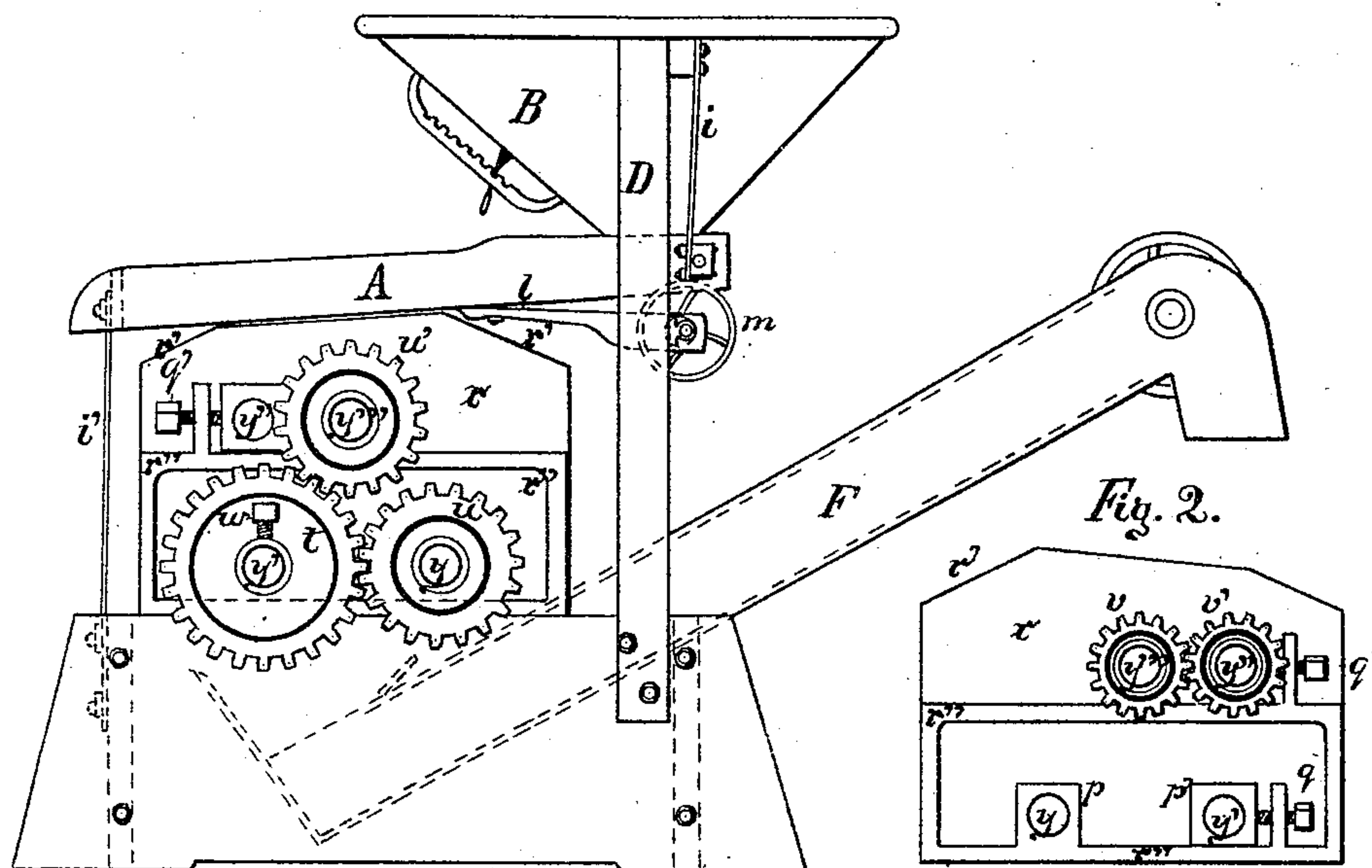


Fig. 3.

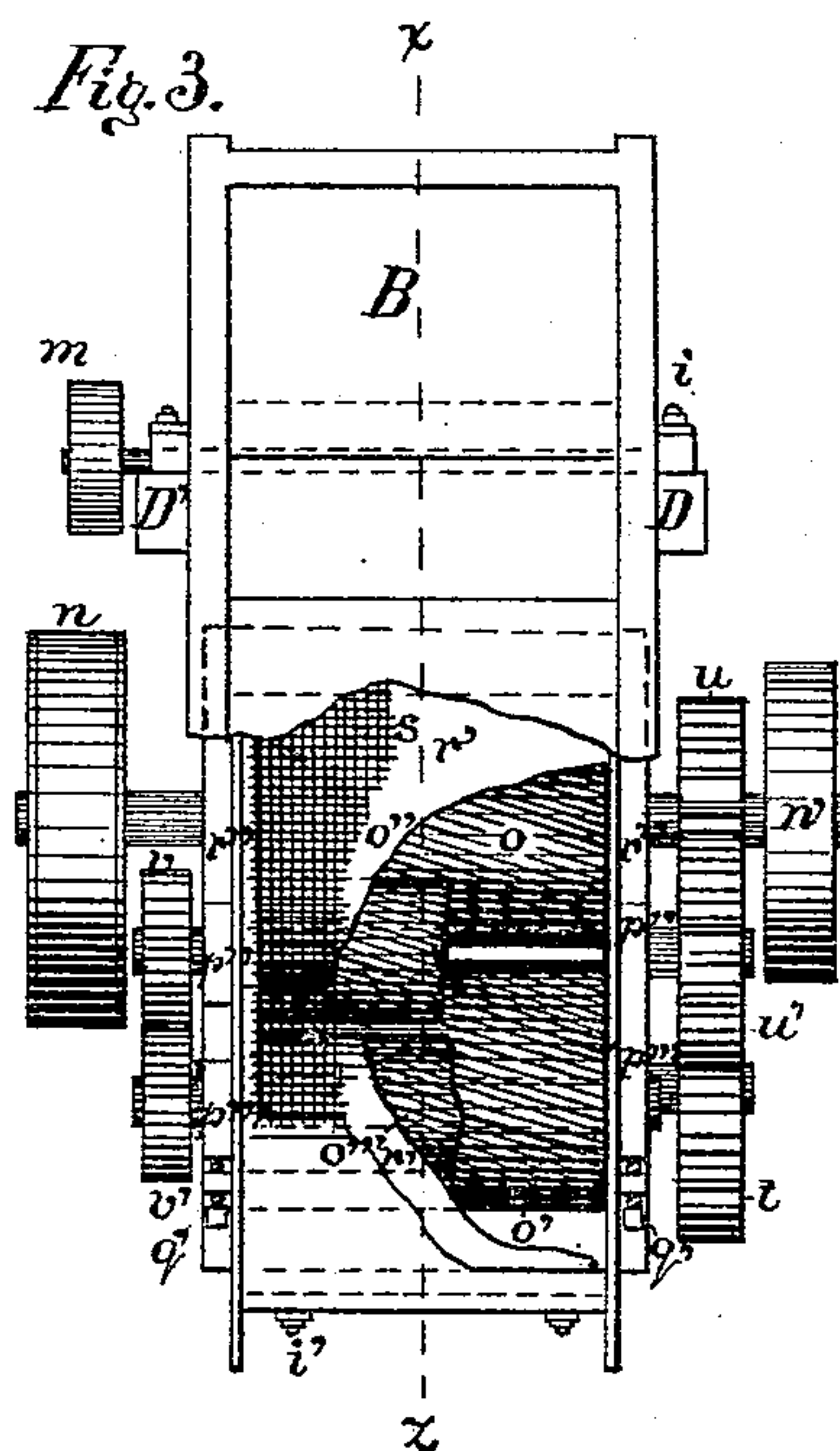
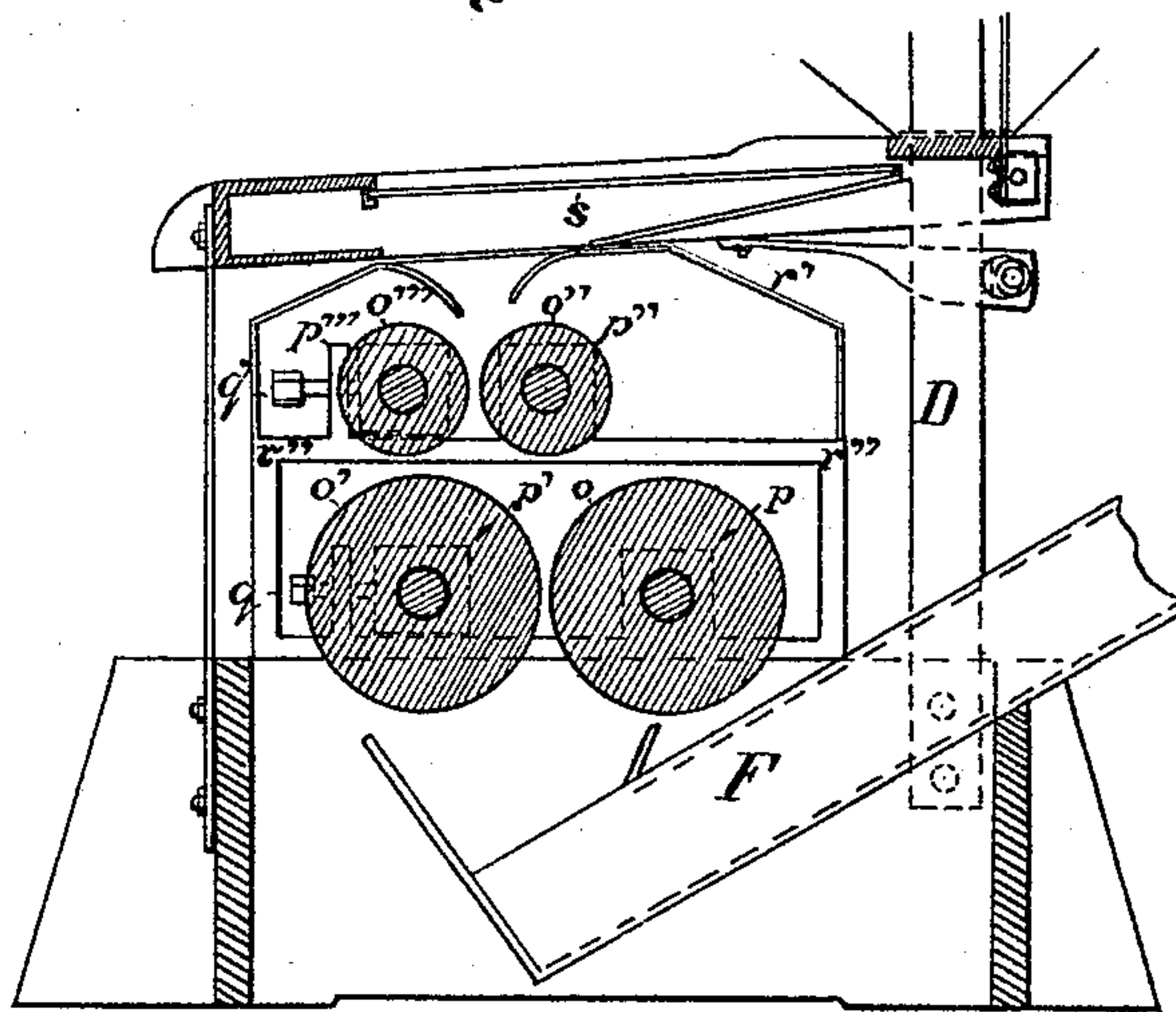


Fig. 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

JONAS D. HENRY AND WILLIAM E. WOOD, OF PORTLAND, OREGON.

FEED-MILL.

SPECIFICATION forming part of Letters Patent No. 459,466, dated September 15, 1891.

Application filed April 14, 1890. Serial No. 347,862. (No model.)

To all whom it may concern:

Be it known that we, JONAS D. HENRY and WILLIAM E. WOOD, citizens of the United States, residing at the city of Portland, Multnomah county, and State of Oregon, have invented a new and useful Improvement in Feed-Mills, of which the following is a specification.

Our invention relates to mills for crushing and grinding, which are also provided, incidentally, with the following elements, viz: a vibrating shoe hung from springs, so as to permit a free oscillating movement, combined with a feeder and feed-regulator, the latter being the features of an invention for which we have made application for Letters Patent filed January 27, 1890, Serial No. 338,319; and it is our object in this invention, first, to increase the working capacity of such mills; second, to produce a finer grade of feed, and, third, to overcome the obstacles met with in running such substances as corn through mills by providing said mills with suitable gearing for operating the same by means of positive differential motion, so as to obtain a crushing and grinding action; and these objects we carry into effect by the mechanism illustrated by the accompanying drawings, referred to as a part hereof.

Figure 1 is a side elevation. Fig. 2 is a side elevation of the opposite side of the housing seen in Fig. 1 and gearing for operating the upper rolls. Fig. 3 is a top view with parts broken away, and Fig. 4 is a partial longitudinal vertical section on the line xz in Fig. 3, the brackets r'' and boxes supported thereon being shown and the side of the housing omitted.

Similar letters refer to similar parts.

The standards $D D'$ support the hopper B , provided with an adjustable sliding gate and adjusting mechanism therefor. The vibrating shoe A is hung from springs $i i'$ and carries a board or feeder a , which coacts with such hopper B by oscillating against the open base thereof, and so constitutes the feed-discharging device of our mill, the shoe being operated by a pitman-rod l , set on the shaft of the pulley m and run by a belt from the pulley n . The feed to be crushed being discharged through the hopper into the mill, passing in its course through the screen or sieve

s , is carried into the housing or grinding-box r , in which the crushing and grinding mechanism is located. This consists of a double set of rolls $o o' o'' o'''$, revolving in their bearings in the boxes or saddles $p p' p'' p'''$, the boxes $p p''$ and brackets r'' being cast on the side plates of the housing r , and the saddles or boxes $p' p'''$ being movable and adjustable by set-screws $q q'$. The ends of the housing are inclosed by thin boards r' . The smaller upper rolls act auxiliary to the larger lower ones, being designed to partly crush the feed falling between them and to discharge the same in such semi-crushed state between the larger rolls, which thus relieved can perform their functions more rapidly, increasing the working capacity of the mill. This arrangement of our crushing and grinding rolls is also specially adapted for overcoming the rebounding tendency of such substances as corn when run through a mill, for by setting the upper rolls loosely the corn will readily pass between them, being cracked or broken while so doing, and then dropped between the larger rolls, where the crushing and grinding process can be readily completed. The larger rolls $o o'$ may be constructed about ten inches in diameter and fourteen inches in length, and the smaller rolls $o'' o'''$ about five inches in diameter, their length corresponding to the larger rolls, all rolls being slightly corrugated on their outer surface. These rolls are operated by pinions $t u u' v v'$, gearing in each other. The larger pinion t , attached to the shaft y' of the roll o' , gears in the pinion u on the shaft y of the roll o and in the pinion u' on the shaft y''' of the upper roll o'' , on the opposite end of which shaft y''' is affixed the pinion v , gearing in the pinion v' on the shaft y'' of the roll o''' , and thus operating the upper rolls. By this arrangement the roll o , operated by the pinion u , revolving faster than the roll o' , operated by the pinion t and the roll o'' , carrying on its shaft the pinion v , (preferably given about fifteen teeth,) revolving faster than the roll o''' , operated by the pinion v' , (preferably given about nineteen teeth,) we attain, as is obvious, a crushing and grinding action, by means of which the feed may be ground almost as fine as flour, if desired, the rolls o' and o'' being adjustable relatively to the rolls o and o''' , respectively,

by the set-screws q q' . Our mill may also be used as a simple crushing-mill, the largest pinion t being so constructed that when a grinding action is not wanted loosening the set-screw w thereof will turn the same into an idler, thereby releasing the roll o' , operated by it, though permitting such pinion t still to transmit the power from the pinion u to the pinions $u' v v'$, thereby operating the upper rolls. We prefer to operate our mill by a pulley n' , set on the shaft y , and, if desired, the pinions may be covered by a shield to prevent any feed from getting into the mesh of the operating-gear.

Having fully described our invention, now what we claim, and desire to secure by Letters Patent, is—

1. In a feed-mill, the combination, with main and auxiliary crushing and grinding rolls, of operating-gear for imparting motion to said rolls, the gear, as t , on the shaft of one of said main rolls, having means whereby it may be loosened to convert it into an idler, thereby releasing its roll, substantially as described, whereby the mill may be converted from a crusher and grinder to a crusher, or vice versa, motion to the upper rolls being always transmitted through said gear t .

2. In a feed-mill, the combination of the

gearing, the pinions t, u, u' , and $v v'$, operating the crushing and grinding rolls $o o' o'' o'''$, the pinion t being provided with a set-screw w , which may be loosened and so convert such pinion into an idler, the roll o' being released and operated by friction by the roll o , though the power is still transmitted through such pinion t to the gearing for operating the upper rolls, substantially as described.

3. In a feed-mill, the combination, with the housing having brackets and boxes located in pairs one above the other and one of each pair being adjustable toward and from the other, as described, of crushing and grinding rolls and suitable operating-gear for imparting to said rolls positive differential motion, one of said gears having means whereby it may be loosened from its shaft to convert it into an idler, thereby releasing its roll, though the power is still transmitted from it to the gearing of the upper rolls, substantially as described.

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