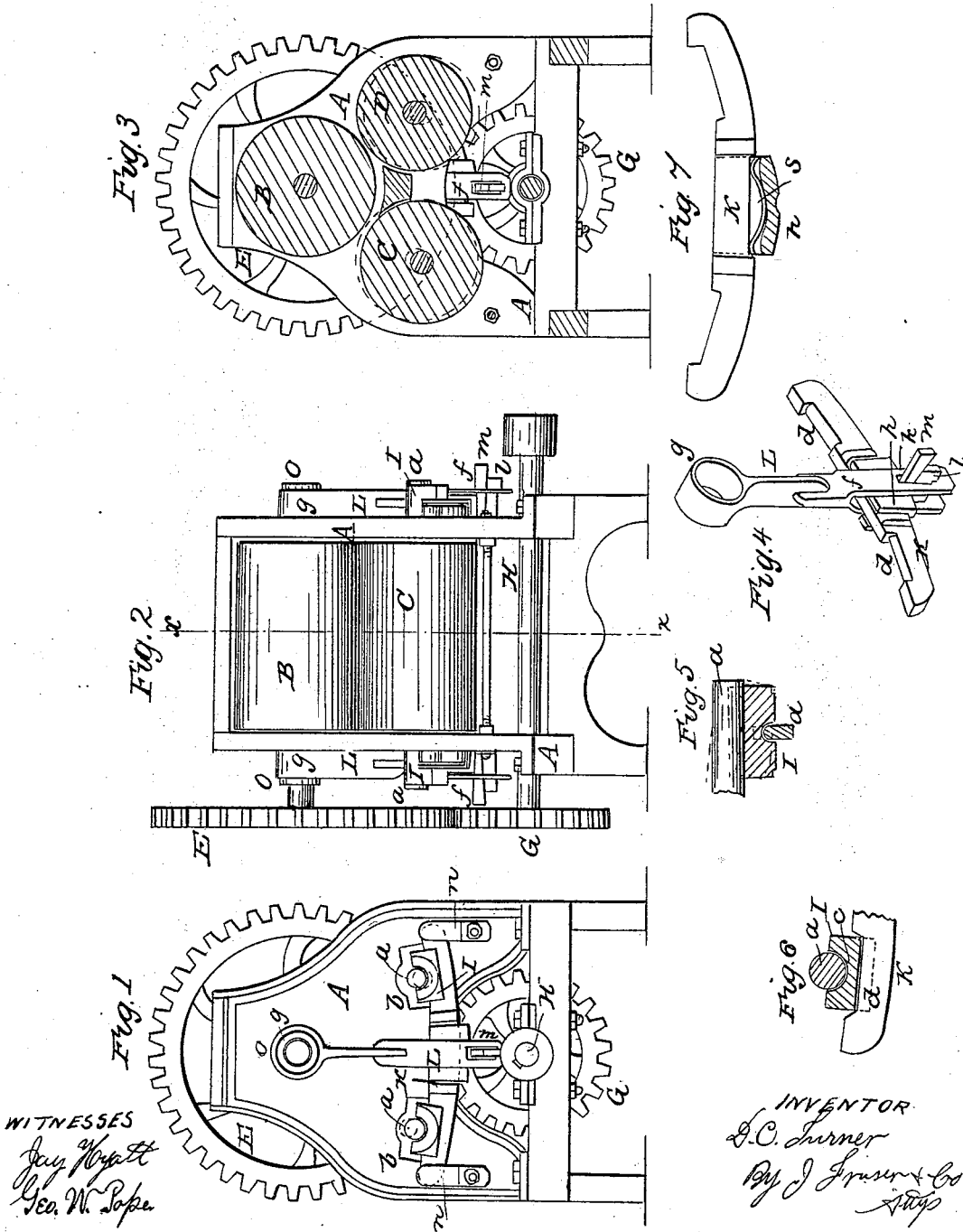


Cane Crushing Machine.

No. 46,835.

Patented March 14, 1865.



UNITED STATES PATENT OFFICE.

DON CARLOS TURNER, OF MADISON, WISCONSIN, ASSIGNOR TO HIMSELF
AND CHARLES SILLIMAN.

IMPROVEMENT IN MACHINES FOR CRUSHING SUGAR-CANE.

Specification forming part of Letters Patent No. 46,835, dated March 14, 1865.

To all whom it may concern:

Be it known that I, DON CARLOS TURNER, of Madison, in the county of Dane and State of Wisconsin, have invented certain new and useful Improvements in Machines for Crushing Sugar-Cane; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1 is an end elevation of my improved machine; Fig. 2, a front elevation of the same; Fig. 3, a vertical transverse section in the plane of line *x x*, Fig. 2; Fig. 4, a perspective view of one of the yokes and supporting-stirrups detached; Figs. 5 and 6, longitudinal and transverse sections, respectively, of one of the boxes supporting the roller-shafts.

Like letters of reference indicate corresponding parts in all the figures.

The object of my improvement is to express the juice from cane and similar stalks; and the invention consists, essentially, in yokes suspended by stirrups from the axis of the upper roller and supporting the journals of the lower rollers in such a manner that when one lower roller expands or opens to admit the cane, the other contracts or shuts in such a manner as to produce the greatest pressure, and vice versa; also, in the method of tightening or adjusting the rollers, and in the arrangement of the boxes that support the lower rollers relatively to the bearings of the yoke.

As represented in the drawings, *A* is a suitable frame, in which are mounted three rollers, *B*, *C*, and *D*, the upper one being stationary, while the lower ones are adjusted to a certain degree, as will presently be described. The upper or driving roller may receive motion by any desirable means, that represented being a cog-wheel, *E*, on its shaft, gearing with another wheel, *G*, on driving-shaft *H*. The lower rollers preferably receive their motion from mere contact or friction produced by the passage of the cane between; but, if desired, they may also be geared in any desirable manner. The journals *a a* of the lower rollers pass out through openings *b b* of the frame of sufficient size to allow some adjustment up and down, and rest in boxes *I I*, which are provided centrally and transversely with grooves *c c*, that fit over bearings *d d* of a yoke, *K*, at each end of the frame. This yoke is

suspended in the middle in the fork *f* of a stirrup, *L*, which extends upward, having a ring, *g*, that fits over the bearing *o* of the journal of the upper or driving roller. I prefer to inclose the middle of the yoke that rests in the fork in a block, *h*, so that it may vibrate easily. Slots *k k* are cut in the sides of the fork, in which rest a block, *l*, and between this block and the yoke is a key or wedge, *m*, by driving or tightening which the lower rollers may be raised to any desired degree. The yoke is kept in position by means of suitable guides, *n n*, attached to the side of the frame. Among the advantages of this arrangement are the following:

First. The yoke *K* forms a lever, having its fulcrum in the center, so that as the roller supported by one side of the lever is depressed that supported by the other is raised. This action is of great consequence in crushing cane, for it is desirable that the mouth or opening *p*, between the rollers, through which the cane enters, should be large, so that it will pass easily, while at the opposite side, *q*, it should be closed, so as to effectually crush the cane. By this means the rollers adapt themselves exactly to place—for the wider one opens to receive the material, the closer the other shuts to crush it. By this means, also, the rollers adapt themselves to any inequality of the material that passes through. I am enabled by the use of the key *m* to raise or depress the yoke at any time, so as to make the rollers bear more or less.

Second. The employment of stirrups *L* in connection with the yoke enables me to suspend the lower rollers upon the box *o* of the upper one. This binds the rollers together in such a manner that the strain is in a great measure confined thereto—that is, the lower rollers, being bound to the upper one, do not bear in that portion of the frame where they are situated, but are suspended from the point *o* in the center of the frame. The sides of the frame, therefore, can be of much less strength than is usually required, the center being always the strongest. The stirrup also forms the most convenient means of suspending the yoke to produce the best action, though it is apparent that other means of supporting and adjusting the yoke might be devised.

Third. The boxes *I I*, supporting the jour-

nals of the lower rollers, by being provided with the grooves *cc*, resting on the bearings *d d* of the yoke, allow the rollers to adapt themselves to any position without their journals binding or producing excessive friction. For instance, it is frequently the case that a larger amount of the material to be crushed passes through at one end of the rollers than at the other, in which case the tendency would be to separate the rollers to a greater degree at that end. In this condition, if the boxes *I* were rigid, there would be great binding and friction of the journals, as they would not run true; but by being hung, as described, on the yoke they can incline and adapt themselves exactly to the position of the rollers, as indicated by red lines, Fig. 5. The grooves and bearings *c d* also keep the boxes in place on the yoke.

Fourth. The employment of the spring *s* gives a certain degree of elasticity or yieldingness to the yoke, so as to allow any hard substance—such, for instance, as a small stone—to pass through, and its position is such as to yield on either side of the center, and thus allow the lever to move in either direction. By this arrangement a single spring answers to give elasticity to both lower rollers, thereby avoiding the necessity of a separate spring to each, with complicated accompanying devices which could not be used, and still allow the yoke to have the vibrating motion, as described above. It will be seen that the employment of the single spring allows the yoke a free movement under all circumstances.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The stirrup *L*, suspended from the fixed bearing of the upper roller, and sustaining the lower rollers in place in the act of pressing, and allowing them a free motion, and so arranged as to bind the rollers together, so as to confine the strain principally to the middle of the frame, substantially as herein set forth.

2. In combination with the stirrup *L*, the yoke *K*, and rollers *C*, *D*, and *B*, substantially as and for the purposes specified.

3. In combination with the yoke *K*, provided with the rounded bearings *d d*, and with the rollers *C D B*, the boxes *I I*, provided with transverse grooves *c c*, resting on the said bearings of the yoke, the whole so arranged that the yoke is allowed to vibrate to open or close the rollers, and so that either one end or the other of the lower rollers may be depressed more than the opposite end, to allow any inequality to pass through, substantially as herein set forth.

4. The spring *s* and block *h*, in combination with the yoke *K* and rollers *C B D*, arranged and operating substantially as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

DON CARLOS TURNER.

Witnesses:

J. M. FLOWER,
R. F. MCGONIGAL.