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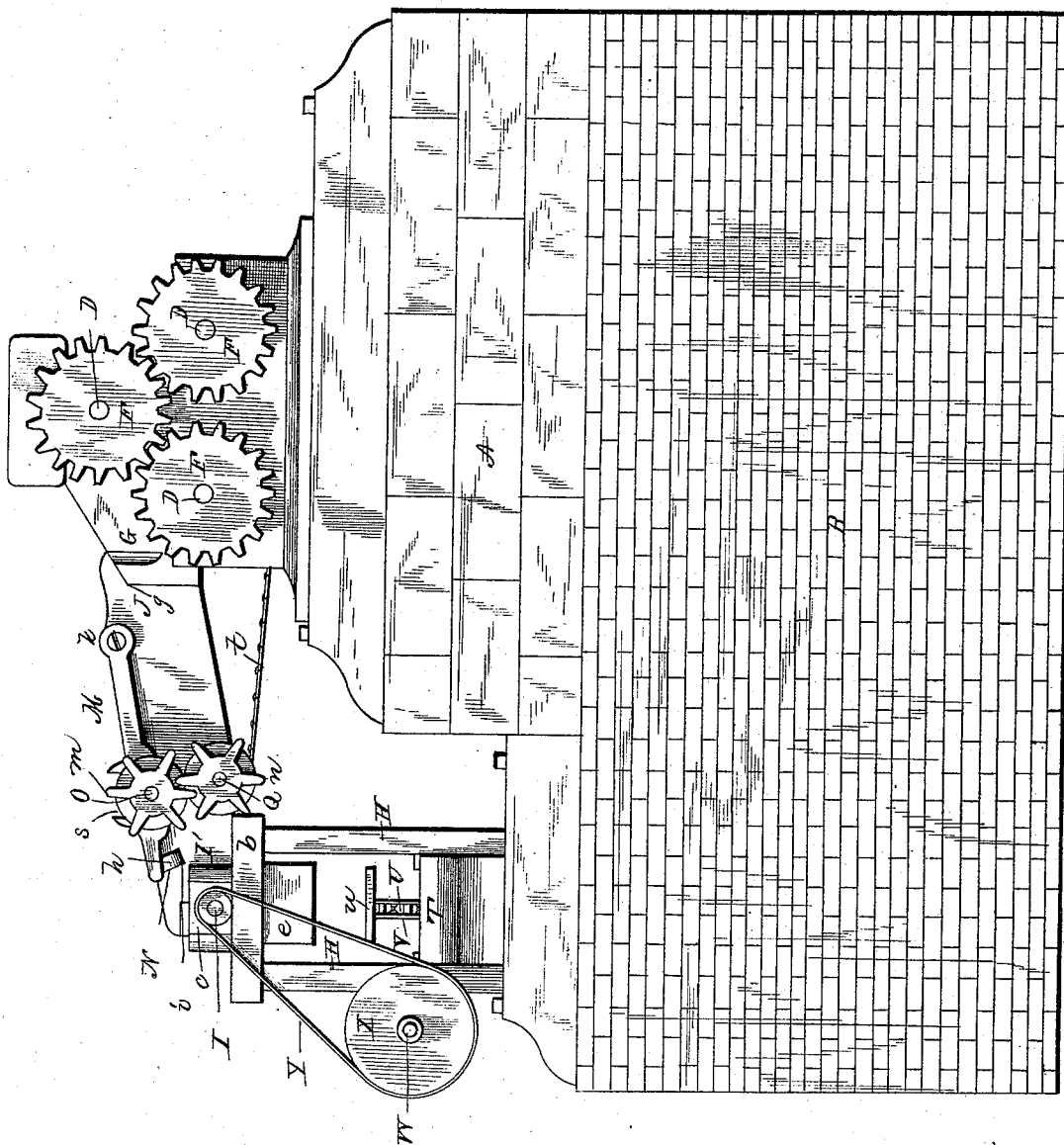
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A. A. & J. J. HIBBARD.

BAGASSE PULVERIZER AND FURNACE FEEDER.

No. 305,450.

Patented Sept. 23, 1884.



WITNESSES  
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Geo. F. Downing

Fig. 1.

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By H. A. Symmons  
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(No Model.)

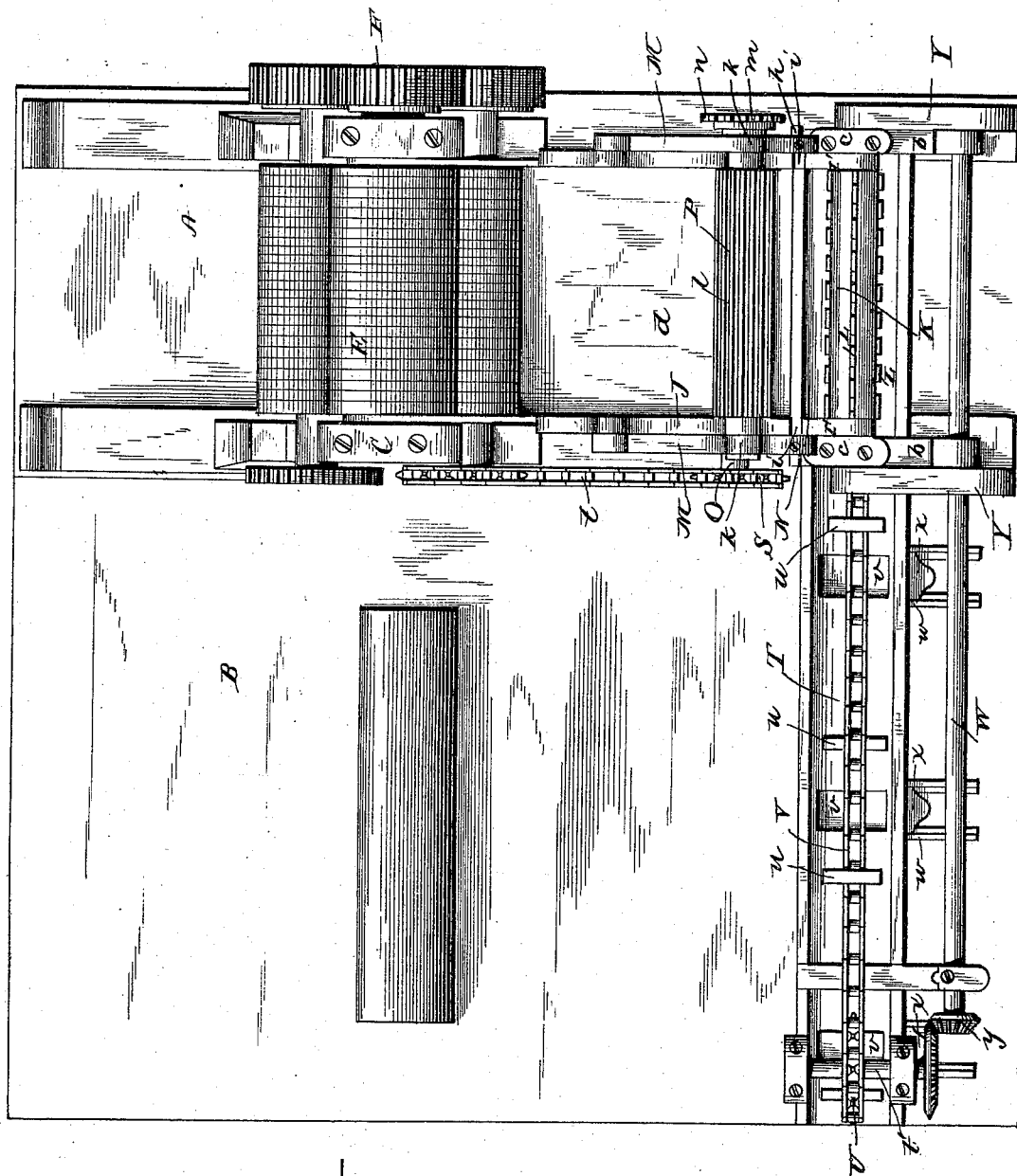
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Fig. 2

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(No Model.)

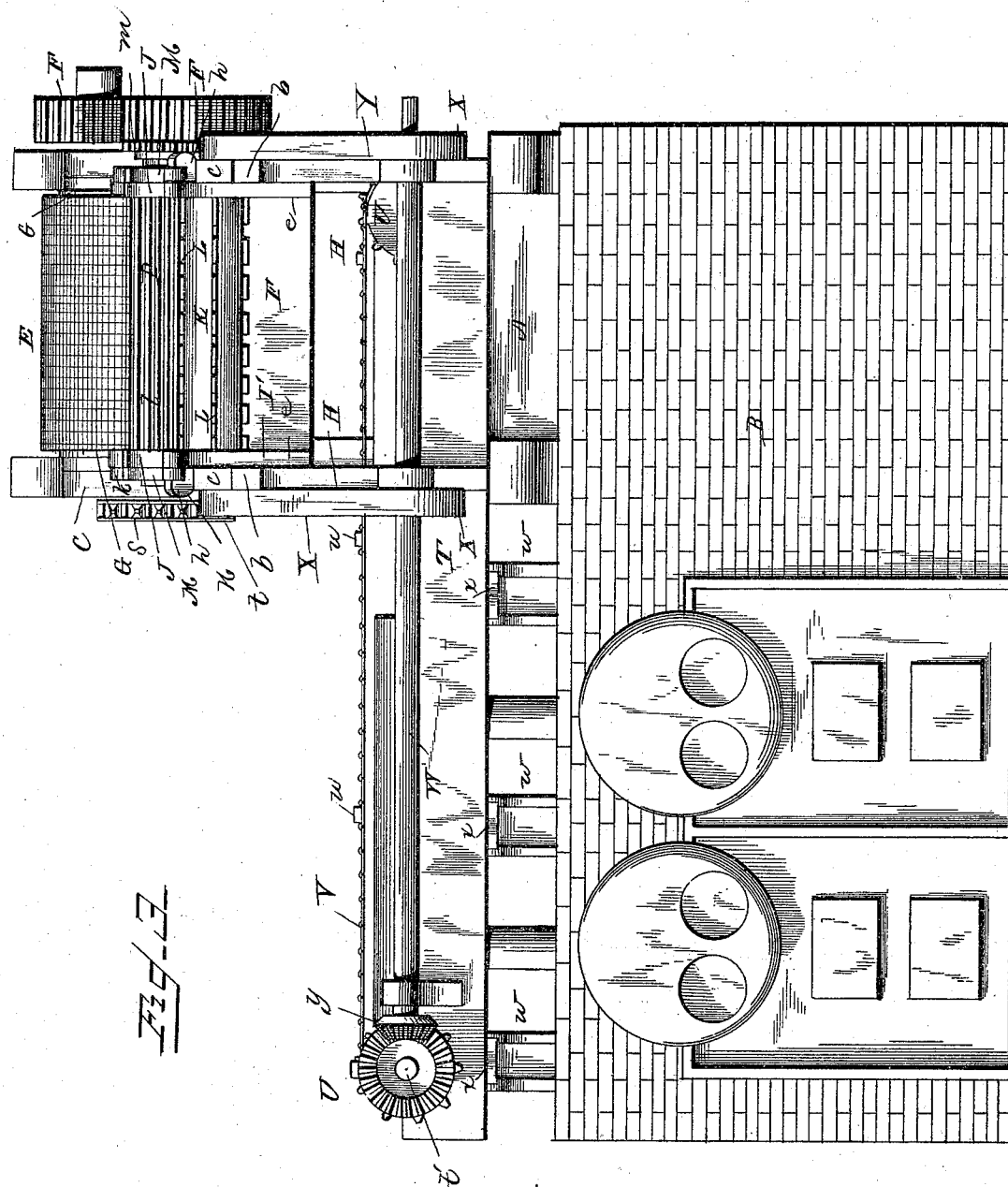
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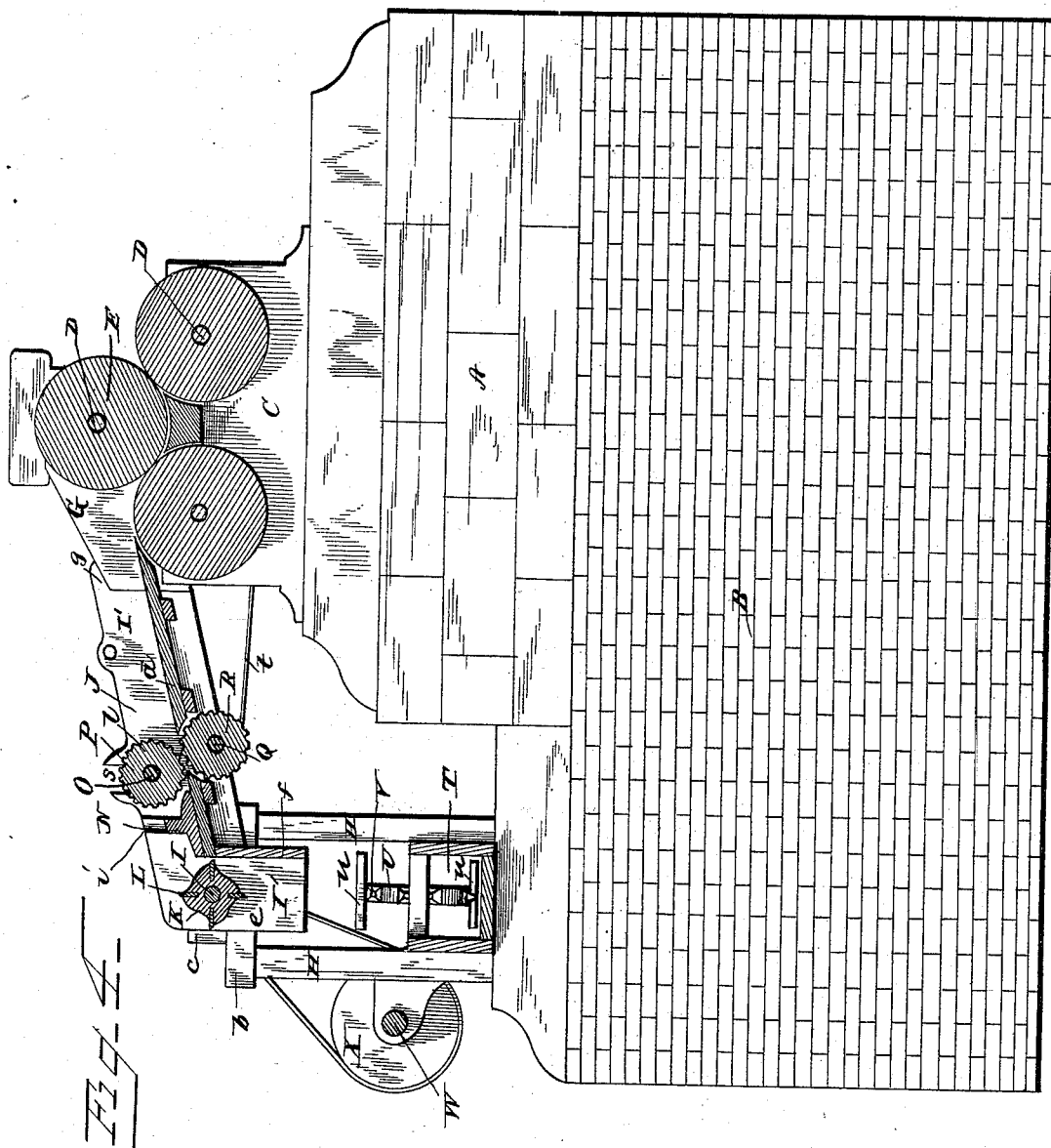
A. A. & J. J. HIBBARD.

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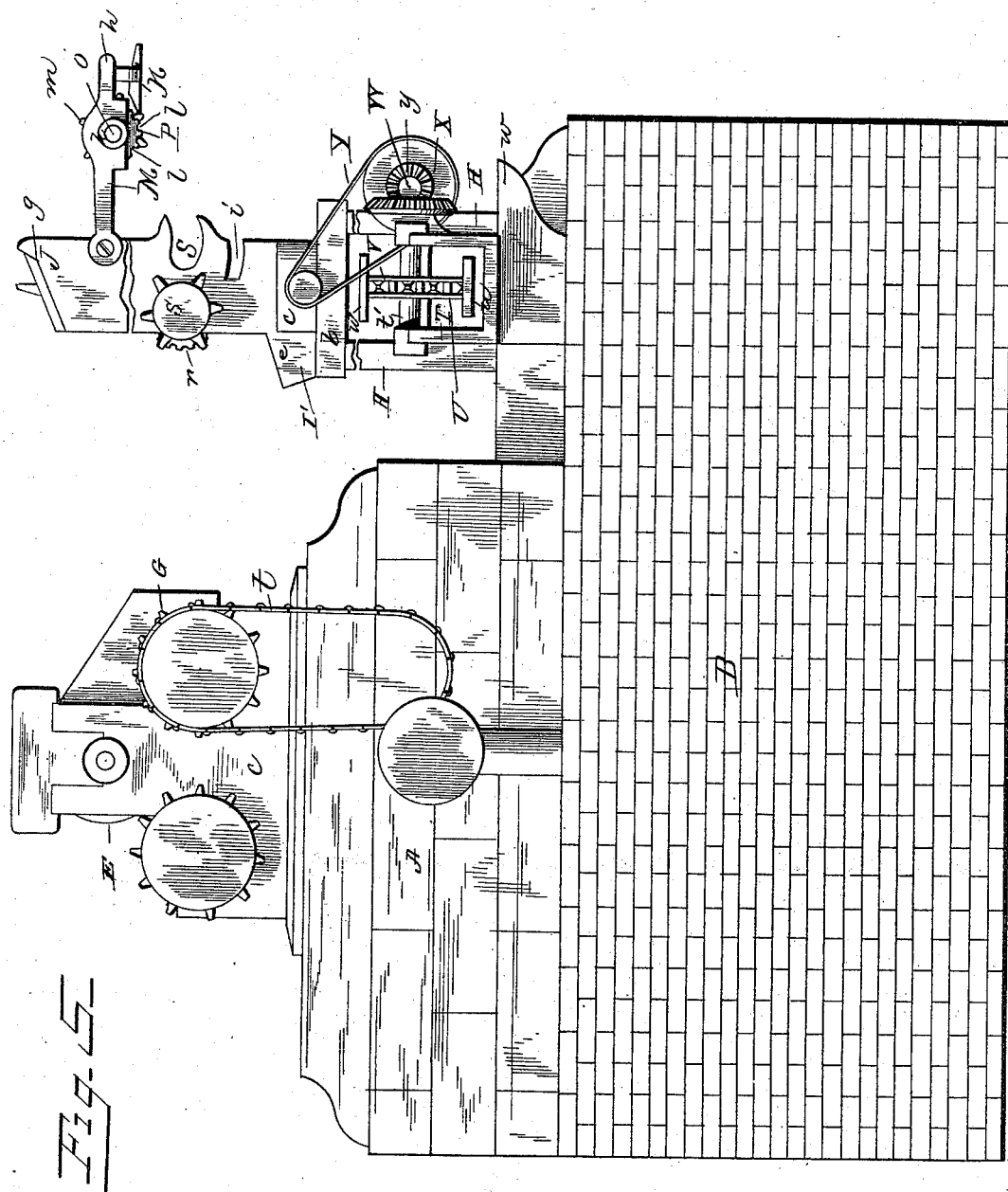
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*WITNESSES*

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# UNITED STATES PATENT OFFICE.

ASHLEY A. HIBBERD AND JOHN J. HIBBARD, OF DULUTH, MINNESOTA.

## BAGASSE-PULVERIZER AND FURNACE-FEEDER.

SPECIFICATION forming part of Letters Patent No. 305,450, dated September 23, 1884.

Application filed June 9, 1884. (No model.)

### *To all whom it may concern:*

Be it known that we, ASHLEY A. HIBBERD and J. J. HIBBARD, of Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Bagasse-Pulverizers and Furnace-Feeders; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to an improvement in devices for pulverizing and feeding bagasse to furnaces, the object being to provide a device of this character which shall first compress the bagasse, and then cut or saw it into small pieces, and finally to feed the prepared bagasse to the furnace; and with these ends in view our invention consists in certain novel features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view of our improvement in side elevation. Fig. 2 is a top plan view. Fig. 3 is a view in front elevation. Fig. 4 is a view in section. Fig. 5 is a view showing the pulverizer and the compressor rollers and plates in their raised position.

A represents the base or foundation for the machine, built upon the top of the furnace B or to one side thereof, and formed of any desired material, and to which are secured the brackets or bearings C, in which are journaled the spindles D, carrying the crushing-rollers E, the spindles D being also provided with gear-wheels F, the two lower of which mesh with the upper middle wheel. These rollers E are of any suitable size, and are arranged as shown, one roller being located above the other two and in close proximity thereto. Between the ends of the rollers and the bearings C are removably secured the shields G, each provided with an upper inclined side, *a*. To the top of the furnace, and in front of the foundation A, are secured the uprights H, provided with a top cross-piece, *b*, to which are secured the bearings *c*, in which is journaled a shaft or spindle, I, carrying a cylinder, K, provided

with cutters L running longitudinally. On the spindle I, between the end of the cylinder and the bearings *c*, is loosely secured the lower end of the inclined trough I', the floor *d* of which extends within close proximity to the cutter-knives L, the trough being provided with the downwardly-projecting ends *e*, to which are secured the cross-piece *f*, extending upwardly to the under side of the floor *d*. The trough extends rearwardly, a portion of its sides J being cut away and forming shoulders *g*, adapted to rest on the lower ends of the shields G, and support the trough in its inclined position, the floor of said trough extending within a short distance of the lower forward roll, E. By pivoting or loosely connecting the trough to the spindle I the rear end thereof may be raised and easy access to the rolls E had. If desired, the upper end of the trough may be weighted or provided with a suitable lock, in order to keep it in its lowered position.

To the sides J of the trough, near the upper rear ends thereof, are pivotally secured the arms M, the lower forward ends of which extend nearly to the cylinder K, and are connected by the compressor-plate N, the ends of which are cut away to allow it to fit down in between the sides J of the trough, the reduced ends *h* of the plate being adapted to fit in recesses *i*, formed in the sides J of said trough, said plate, when lowered, resting close to the floor *d*.

To the pivoted arms M are secured bearings *k*, in which is journaled a spindle, O, carrying the compressor-roll P, provided with longitudinal grooves *l*, the outer end of the spindle O being provided with a gear-wheel, *m*, adapted to mesh with a similar gear, *n*, secured to the outer end of a spindle, Q, journaled in bearings *o*, secured to the sides J of the trough. The spindle Q is provided with a roller, R, similar in form and construction to the roller P, and adapted to project up through a transverse opening, *r*, formed in the floor *d* of the trough, the upper edge of said roller R being adapted to rest in line with the upper face of said floor *d*. The sides J of the trough are provided with recesses *s* imme-

diately above the bearings *o*, in which are adapted to fit the bearings *k* when the compressor-plate is lowered, and allow the rollers R and P to approach within a short distance of each other. The other end of the spindle Q is provided with a sprocket-wheel, S, around which passes a chain, *t*, which latter also passes around a sprocket-wheel secured to the end of the spindle D, carrying the lower forward roll, E, all of aforesaid rollers turning in the direction of the arrows. A suitable conveyer or apron may be connected to the rollers E and the cane or sorghum carried to the rollers thereon, which after leaving the apron will pass through said rollers E, and the moisture be thereby extracted, the rollers crushing the cane into a thin mass, after which it will pass down the floor *d*, between the rollers P and R and floor *d* and plate N, to the cutter-knives L on the cylinder K, the said rollers R and P and the plates *d* and N firmly holding the cane or sorghum in place and subjecting it to the action of the knives. After it has been ground fine, it will fall from the trough between the cylinder K and the lower end of the floor *d* into a trough, T, placed immediately below and running parallel with the rollers E, P, and R, the cross-piece *f* preventing the cane from falling too far to the rear, the downwardly-projecting pieces *e* also assisting in guiding the ground cane or sorghum to the trough. In the sides of this trough, and near the ends thereof, are journaled spindles *t'*, carrying sprocket-wheels U, around which passes a chain, V, provided at suitable intervals with the cross-pieces *u'*, adapted when the pulverized bagasse falls into the trough to push it along to openings *v*, formed in the bottom of the trough and leading into the furnace. The trough is supported on the boxes or spouts *w*, through which the bagasse passes from the openings *v*, said spouts or boxes being provided with sliding lids *x*, adapted, when desired, to close the openings *v* and prevent the bagasse from passing into the furnace, in which event it will issue from the end of the trough and fall into a suitable receptacle. On the end of the spindle *t*, at the end of the trough, is secured a gear-wheel or friction-clutch, as desired, adapted to mesh with a similar wheel, *y*, secured to the end of a shaft, W, running parallel with the trough and journaled in bearings secured to the uprights H, and also provided with the pulleys X, around which passes belt Y, the latter also passing around pulleys secured to the ends of the spindle I.

It will now be seen that when the bagasse is fed to the rolls it will be properly pulverized and automatically fed into the furnace below.

It is evident that many slight changes and alterations might be made in the construction and relative arrangement of the different parts without involving a departure from the spirit of our invention, and hence we would have it understood that we do not limit ourselves to

the exact construction herein shown and described, but consider ourselves at liberty to make such changes as fairly fall within the spirit and scope of our invention.

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

1. The combination, with rollers for holding and feeding the bagasse to the cutter, of a knife or knives adapted to cut the bagasse into fine pieces, and means for automatically feeding it to the furnace, substantially as set forth.

2. The combination, with rollers for holding and feeding the bagasse to the cutters, of a knife or knives adapted to cut the bagasse into fine pieces, means for automatically feeding it to the furnace, and means for regulating the feed of the cut bagasse into the furnace, substantially as set forth.

3. The combination, with rollers for holding and feeding the bagasse to the cutters, of a pulverizer consisting of a floor, compressor-rollers, and cutters, a trough or other suitable receptacle placed below the cutter, and a conveyer moving in said trough and adapted to feed the pulverized bagasse to the furnace, substantially as set forth.

4. The combination, with rollers for holding and feeding the bagasse to the cutters, of an inclined floor pivotally secured at its lower end to an upright frame secured to the top of the furnace, the upper end of the floor resting in close proximity to one of said rolls, compressor-rolls secured to the floor, a cylinder provided with cutter-knives, and means for automatically feeding the bagasse to the furnace, substantially as set forth.

5. The combination, with compressing-rollers arranged as described, of a trough the sides of which extend above and below the floor, holding and feeding rolls, one of which is secured to a spindle journaled in said sides, the other secured to arms pivotally secured to the sides, a compressor-plate secured to the ends of the pivoted arms, and a cylinder provided with cutter-knives, substantially as set forth.

6. The combination, with crushing-rollers, rollers for holding and feeding the bagasse, and a cutter, of a trough or suitable receptacle placed below the cutter, and provided on its bottom with openings leading into the furnace, and a chain moving in said trough, substantially as set forth.

7. The combination, with crushing-rolls, a cutter, and a trough or other suitable receptacle placed below the cutter and provided with openings in the bottom, of boxes placed below the trough and said openings and leading into a furnace, lids adapted to close the openings, a chain provided with cross-pieces and adapted to travel around sprocket-wheels secured to spindles journaled in the sides of the trough.

8. The combination, with the rollers E, situated above a furnace, of the trough I, the

holding and feeding rollers, the cutter, trough T, sprocket-wheels U, and chain V, substantially as set forth.

5 9. The combination, with the rollers E, situated above the furnace, of the pulverizer I', trough T, sprocket-wheels U, chain V, boxes *w*, and lids *x*, all of the above parts combined and adapted to operate substantially as set forth.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

ASHLEY A. HIBBERD.  
JOHN J. HIBBARD.

Witnesses:

LUTHER MENDENHALL.  
C. E. BOSTWICK.