Feb. 13, 1923. 1,445,218

E. G. KOCH

SUGAR CANE MILL FEED CONTROLLER

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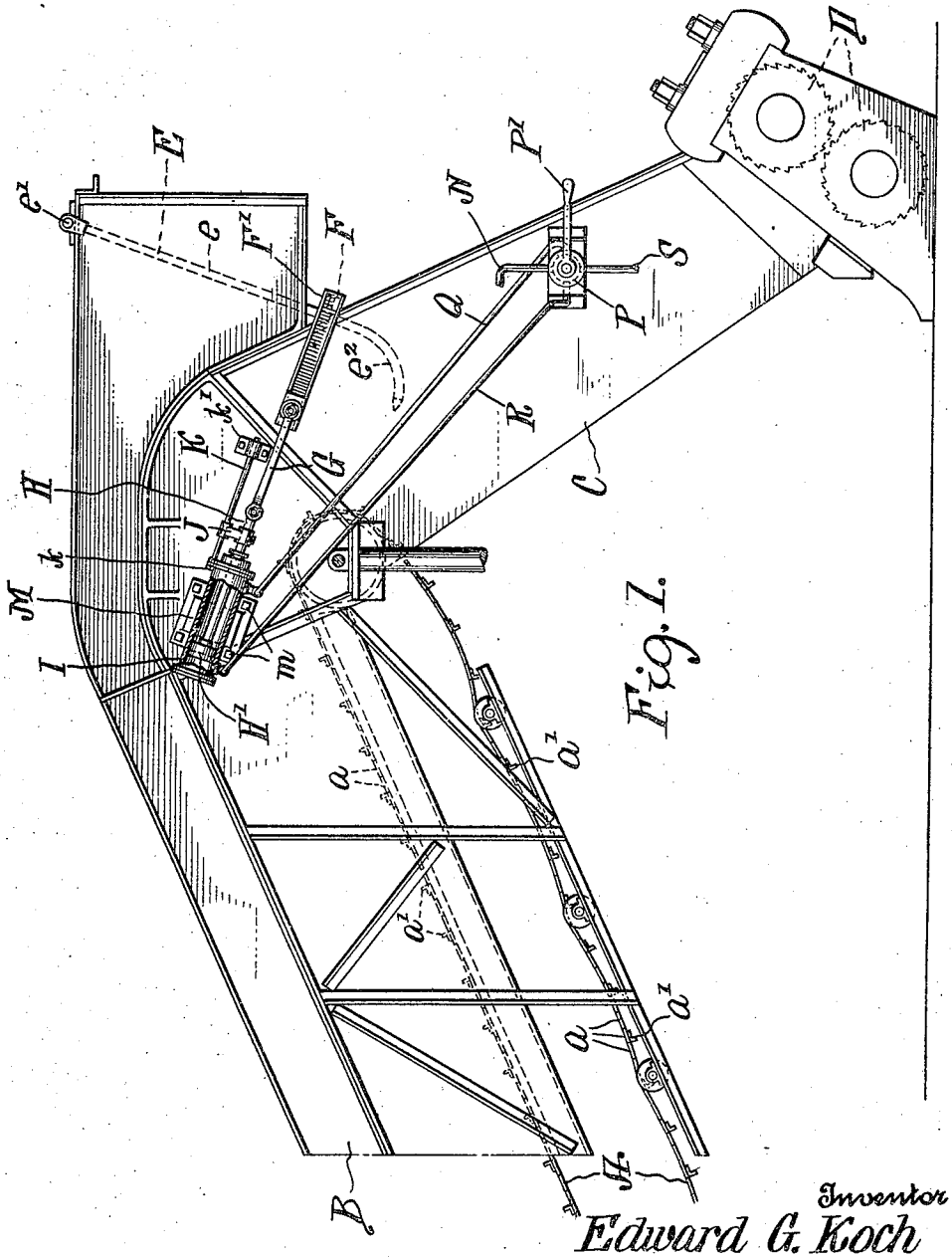


Fig. 1.

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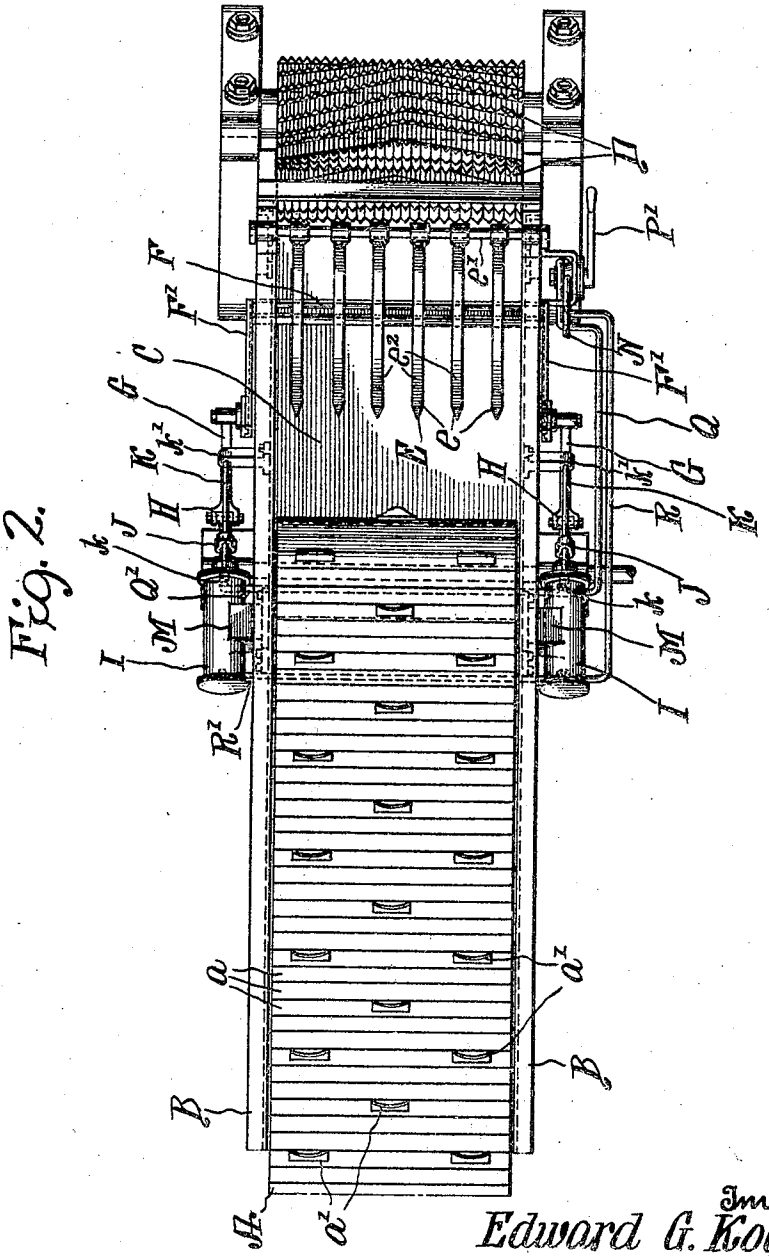
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Fig. 2.



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UNITED STATES PATENT OFFICE.

EDWARD G. KOCH, OF BAYOU GOULA, LOUISIANA, ASSIGNOR OF ONE-HALF TO HARRY A. NADLER, OF PLAQUEMINE, LOUISIANA.

SUGAR-CANE-MILL-FEED CONTROLLER.

Application filed February 28, 1922. Serial No. 539,361.

To all whom it may concern:

Be it known that I, EDWARD G. KOCH, a citizen of the United States, residing at Bayou Goula, Iberville Parish, State of Louisiana, have invented certain new and useful Improvements in Sugar-Cane-Mill-Feed Controllers; and I 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.

It has been difficult in practice to properly regulate the feeding of sugar cane to the mill or to the crushers owing to various causes, amongst which may be stated:

(1) An uneven supply of cane to the carrier at the place where the carrier is fed, which uneven feed is, of course, carried along to the mill or crusher.

(2) The nature of the cane stalks themselves, whether crooked or straight, or long or short, all of which affect the nature of the feed.

(3) There is a tendency of the feed cane to nip or to choke up in the chute leading to the mill or crusher, which causes a considerable unevenness in the feed.

There are also other causes which need not be enumerated.

This unevenness in the feed causes unequal extraction of the juice, and imposes at times excessive strains upon the receiving rolls.

These receiving rolls are ordinarily the crusher rolls through which the cane is passed from the roller before being fed to the grinding rolls.

According to my invention I provide power operated means manually controlled, which in a large measure prevents the choking up of the cane as it leaves the carrier and is fed to the crusher, and provides a substantially normal and constant volume of sugar cane fed to the crusher and mill rolls; thereby increasing the capacity of the milling tandem through the regularity of the feed, and at the same time aiding in the sucrose extraction and reducing the moisture in the bagasse, due to maintaining a level mat of bagasse passing through the mill rolls at the mill setting required for the thickness of the mat.

This regularity of feed also reduces wear and tear on the milling tandem by eliminating choking and nipping of the cane, which in turn reduces vibration and excessive working of the top rolls of the milling tandem hydraulics.

My invention will be more fully understood after reference to the accompanying drawings, in which like parts are indicated by similar reference symbols throughout the several views, and in which:—

Figure 1 is a view in side elevation of the upper end of the cane carrier with the delivery chute connecting the same with the crusher rolls, parts being broken away; and

Figure 2 is a plan view of the device shown in Fig. 1.

A represents the cane carrier in the form of an endless belt which travels between the fixed side walls or rails B. Certain of the slats *a* of this carrier may be provided with cleats *a'*, if desired, which cleats should preferably be staggered as shown in Fig. 2.

This carrier is driven in the usual or in any convenient way; the mode of driving same being well known in the art will not be further described herein.

C represents the delivery chute for delivering the cane from the end of the carrier to the crusher rolls D, which crusher rolls may be of any suitable or preferred type.

The construction and operation of the crusher rolls not being a part of my present invention will not be further described herein.

Instead of delivering the cane to the crusher rolls, the same may be delivered directly to the mill if desired; but it would ordinarily be preferable to pass the same between crusher rolls before subjecting it to the ordinary milling rolls. The controller can be placed over the head shaft drum of the feeder table or cross conveyor which conveys cane to the main cane conveyor.

Projecting down between the side walls of said chute, I provide cane holding or arresting mechanism comprising a rake E having a series of tines *e* rigidly attached to the shaft *e'*. These tines are curved, as at e^2, the whole forming a pivoted rake or holder somewhat similar to those used on harvesters.

Engaging the back of this rake is a movable beam F, forming with the side brackets F' a rectangular yoke, the ends of which side brackets are connected by the connecting rods G to the piston rods H, fast to the pistons H' of the cylinders I.

To prevent sagging of the piston rods I

may provide a sliding support J, fast at one end to the piston rod and having its other end sliding on the guide rod K which has one end fast, as at *k*, to the cylinder, and the other end secured, as at *k'*, to the framework of the apparatus. The cylinders may be secured to the side walls of the carrier in any convenient way, as by the brackets M and bolts *m*.

In Figure 1 I have shown the rake in the lifted position for narrowing down the throat through which the feed cane passes from the carrier to the crushers. The pistons are moved in the cylinders by fluid pressure, as water pressure, steam pressure, or the like. I have shown the fluid pressure applied through the pipe N to the valve P, which is controlled by the hand lever P'. This valve directs the fluid through the pipe Q, moving the piston in the direction for lifting the rake, and through the pipe R in the direction for lowering the rake. The fluid is exhausted through the exhaust pipe S. It will be seen, however, that it will only be necessary to use any appreciable amount of fluid pressure for lifting the rake, as the weight of the cane thereon and also the weight of the parts will tend to restore the rake to the lowest position under the action of gravity.

The fluid pressure is applied to the two cylinders simultaneously, and for this purpose branch pipes R' and Q' are shown as connected to the second cylinder, see Fig. 2, which is on the opposite side of the apparatus from the first cylinder shown in Fig. 1.

While I have shown two cylinders both simultaneously operated, it will be obvious that a single cylinder with the proper mechanism operated thereby may be used to swing the rake; but I do not mean to limit the invention to the use of two cylinders, although this would ordinarily give a better balanced result.

In the operation of the device, the operator regulates the feed of the cane carried to the mill by swinging the rake to the desired position. This rake will engage the top layer of the feed cane as it passes down the chute and may be eased off to feed more cane, or swung upwards to feed less, as desired.

It would be a very simple matter for the operator to learn by experiment the position of the rake which gives the best results under the conditions prevailing at any given mill.

It will thus be seen that I provide an arrangement by means of which a substantially regular volume of feed to the mill may be secured without excessive variations therein, and the hereinbefore described results may be obtained thereby.

It will be obvious that various modifications might be made in the herein described apparatus, and in the construction, combination and arrangement of parts which could be used without departing from the spirit of my invention; and I do not mean to limit the invention to such details except as particularly pointed out in the claims.

Having thus described my invention what I claim and desire to secure by Letters Patent of the United States is:—

1. In apparatus for regulating the feed of cane to crushing rolls, the combination with a cane carrier, and a chute receiving the cane from the delivery end of said carrier, and delivering the same by gravity to said rolls, of means for checking the flow of the cane down said chute, comprising a swinging rake, power operated means for swinging said rake, and hand operated means for controlling said power operated means.

2. In apparatus for regulating the feed of cane to crushing rolls, the combination with a cane carrier, and a chute receiving the cane from the delivery end of said carrier, and delivering the same by gravity to said rolls, of means for checking the flow of the cane down said chute comprising a swinging rake having tines projecting downwardly and curved towards the carrier end, power operated means for swinging said rake, and hand operated means for controlling said power operated means.

3. In apparatus for regulating the feed of cane to crushing rolls, the combination with a cane carrier, and a chute receiving the cane from the delivery end of said carrier, and delivering the same by gravity to said rolls, of means for checking the flow of the cane down said chute, comprising a swinging rake, a fluid pressure system for swinging said rake, and valve mechanism for controlling said fluid pressure system.

4. In apparatus for regulating the feed of cane to crushing rolls, the combination with a cane carrier, and a chute receiving the cane from the delivery end of said carrier, and delivering the same by gravity to said rolls, of means for checking the flow of the cane down said chute comprising a swinging rake having tines projecting downwardly and curved towards the carrier end, a fluid pressure system for swinging said rake, and valve mechanism for controlling said fluid pressure system.

EDWARD G. KOCH.