(No Model.)

H. L. JESSEN.

PORTABLE CRUSHING MILL.

No. 602,221. Patented Apr. 12, 1898.

Fig. 1.

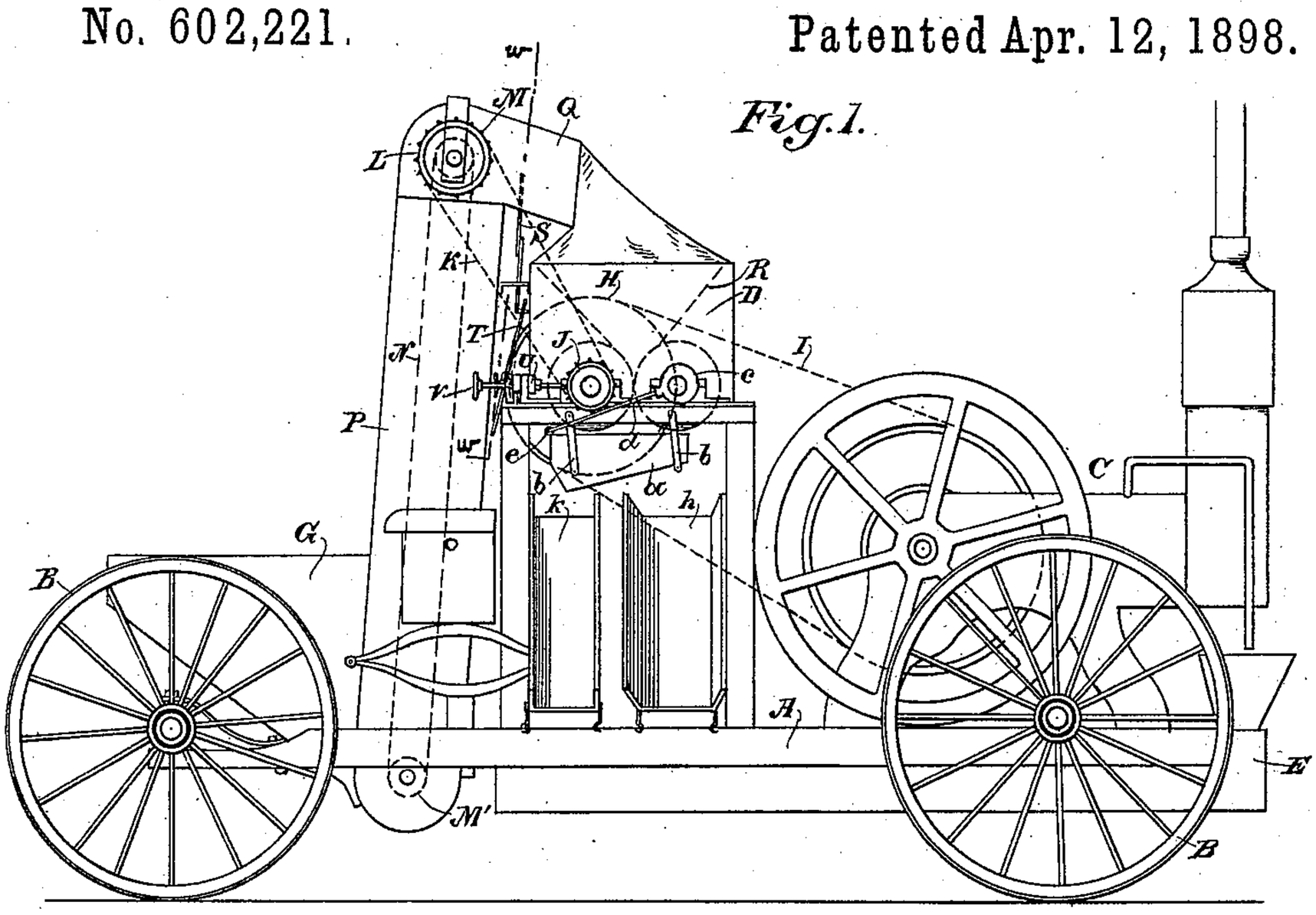


Fig. 2.

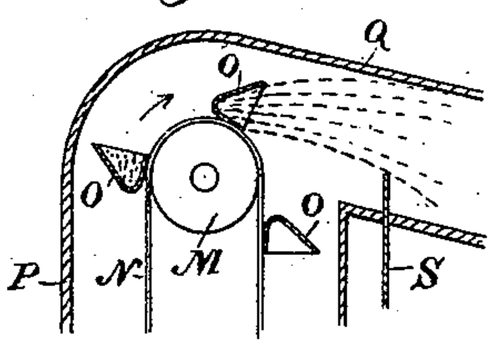


Fig. 3.

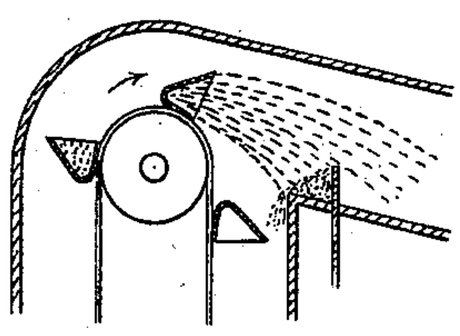


Fig. 4.

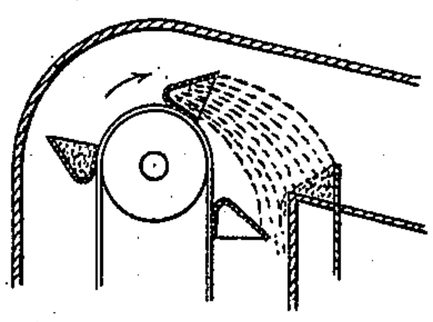


Fig. 5.

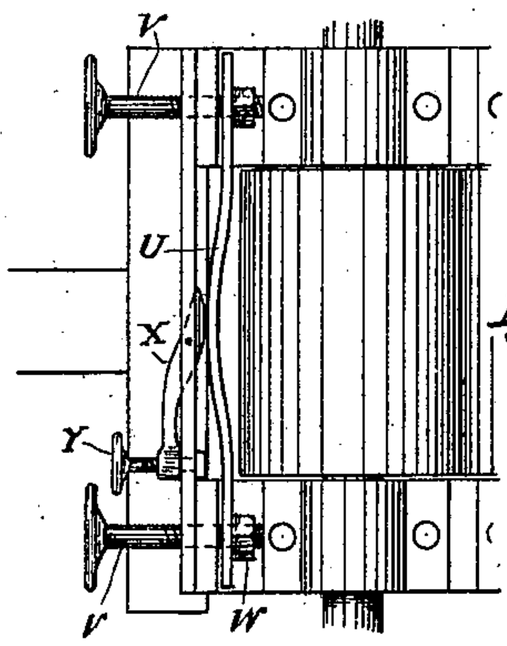


Fig. 7.

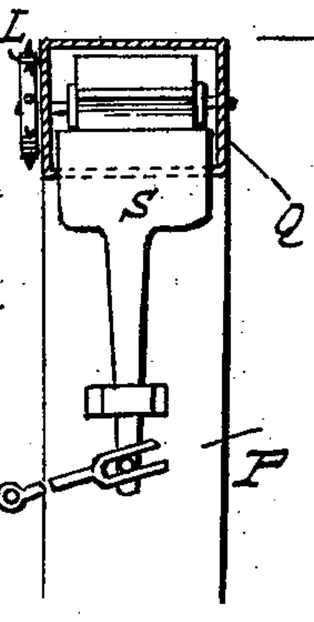
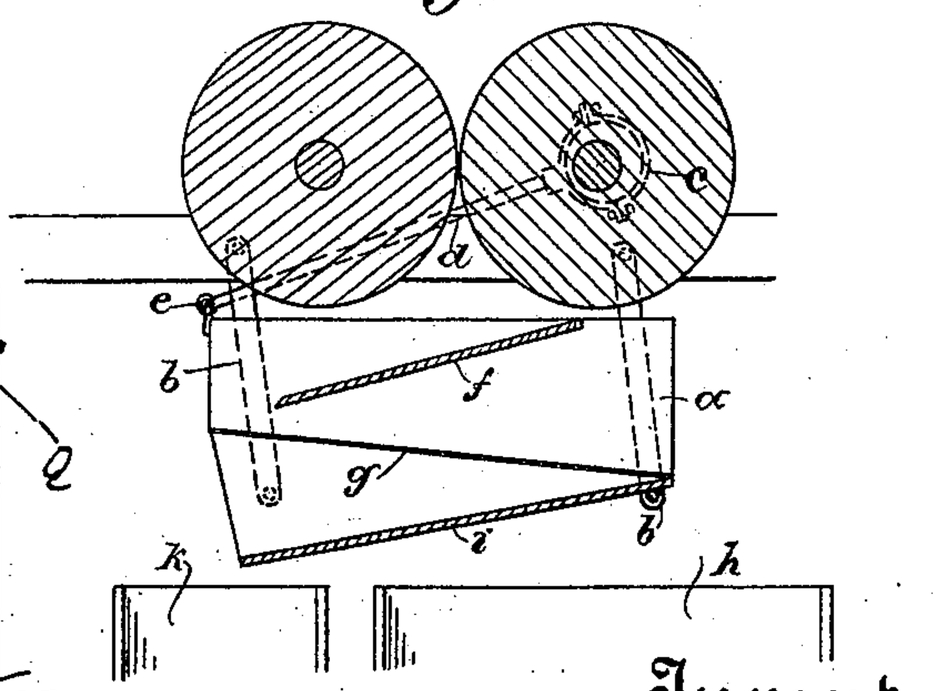


Fig. 6.



Witnesses,
H. Hosse
F. F. Ascheck

Inventor,
Henry L. Jessen
By Dewey & Co.
Attys

UNITED STATES PATENT OFFICE.

HENRY L. JESSEN, OF WATSONVILLE, CALIFORNIA.

PORTABLE CRUSHING-MILL.

SPECIFICATION forming part of Letters Patent No. 602,221, dated April 12, 1898.

Application filed April 6, 1897. Serial No. 630,917. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. JESSEN, a citizen of the United States, residing at Watsonville, county of Santa Cruz, State of California, have invented an Improvement in Portable Crushing-Mills; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus which is especially designed for crushing barley and other grains, the mechanism for communicating power to operate the same, and a means for the support and transportation of the combined mechanism; and it consists in certain details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of my apparatus. Figs. 2, 3, and 4 demonstrate the feeding at full speed and full feed, at three-quarters speed and half-feed, and at half-speed and no feed, respectively. Fig. 5 is a plan of the roller adjustment. Fig. 6 is a section through the separating device. Fig. 7 is a sectional view on the line *w w* of Fig. 1, showing the slidable gate and means for adjusting the same.

For the purposes of crushing grain and other substances it is customary to employ various forms of mills to which power may be communicated from independent sources, and when these devices are to be transported it is necessary to provide for their separate conveyance from one point to another.

In my invention I employ a common bed or framework A, having bearing-wheels B, suitably journaled, and means for attaching power to the bed thus supported for the purpose of moving it from place to place. Upon one end of this bed is mounted the power apparatus, which in the present case is a gas-engine C. Near the opposite end of the bed is mounted the crushing-mill D, and beneath the bed is mounted a shallow tank E of considerable area, which is adapted to contain and supply water to circulate around the water-jacket of the gas-engine cylinder and other parts which are to be kept cool thereby. The water after circulating around the engine-cylinder passes through pipes and is eventually discharged back into the pan or tank, being thus reduced sufficiently in temperature for the purpose. At the opposite end of the bed is a hopper G, suitably situated to allow the grain to be easily poured into it.

The crushing mechanism consists of rollers with shafts journaled in boxes which are adjustable by screws or otherwise to regulate the distance between them and the degree to which the crushing will be carried. A belt-pulley H upon one of the roller-shafts receives the driving-belt I from a corresponding pulley on the engine-shaft, and through this the rollers are operated. By means of belt-pulley J upon the roller-shaft power is transmitted through a belt K to a pulley L, fixed upon the shaft of the upper sprocket M, which carries the elevator-chain N. This chain N is endless, passing over a lower sprocket or drum M′ and it has fixed to it buckets or carriers O. These buckets and the chain travel within the closed elevator-spout P, going up on one side and returning downwardly on the other.

The grain which is placed in the hopper G flows through a controlling-gate at the bottom and into the elevator-spout, where the rising buckets O receive it and carry it upward, turning over the upper sprocket, and by the peculiar shape of the buckets and the short turn which is made in passing around the upper sprocket the grain will be projected from the buckets so as to be discharged through the spout Q, which delivers it into the hopper R of the mill, it being thence delivered between the crushing-rollers, as before described.

S is a vertically movable and adjustable sliding gate which is fixed within the discharge-spout Q, through which the grain is projected, and its lower end is connected with a suitably-connected operating-lever T or other suitable device, so that the slide S may be moved to project to a greater or less distance into the chute Q. This slide being properly adjusted, it will be manifest that when the chain of buckets is moving at the highest rate of speed the grain will be projected over the slide and fall into the hopper R, which serves only as a guide to direct it between the rollers.

When the speed of the chain of buckets decreases, the grain will be thrown less forcibly

and a part will be checked by the slide, so that the smaller quantity will pass to the rollers, and if the amount fed to the rollers is so great that the crushing capacity of the latter is not equal to the supply the increased labor upon the engine will cause the latter to run more slowly, and the chain of buckets, also running more slowly, will deliver little or no grain over the slide to the rollers until the latter are again clear. As soon as this occurs the engine will run more rapidly and the speed of the buckets will be increased. That portion of the grain which is not thrown over the slide falls back and is carried down the elevator-chute P to the bottom, where it will be again taken by the elevator-buckets. It will thus be seen that the centrifugal impulse imparted by the elevator in the half-circle traversed at the upper end and the relation thereof to the casing, the gate, the discharge-spout, and the rolls is what determines the distribution of material according to the speed of the elevator.

The feed-opening between the hopper G and the elevator-spout is so constructed that as long as there is sufficient grain within the chute P to fill the buckets little or no additional grain will be supplied from the hopper, but as soon as the amount within the chute has been decreased by the discharge from the elevator to the crushing-rollers an additional supply will flow in from the hopper G and thus keep a regulated amount within the elevator-chute and the buckets, so that the buckets will always go up full. This device is especially adapted for use with gasolene or explosive engines, the speed of which varies more with varying resistance than that of steam-engines, and it will be seen that the varying speed of the engine under greater or less work done by the rollers will decrease or increase the speed of the chain of buckets, and thus project less or more grain into the guiding-hopper of the feed-rollers. The device acts perfectly and forms a very sensitive governor.

In order to separate the flour which is formed during the crushing process from the crushed barley, I have shown a shaking-screen consisting of a shoe *a*, suspended beneath the rollers by links *b*, which allow it to be oscillated longitudinally. The oscillation is produced by an eccentric or crank *c* upon one of the roller-shafts and an eccentric rod or pitman *d*, extending to and connected with the shoe by a joint at *e*. In the upper part of the shoe is a close bottom *f*, upon which the crushed grain and flour are first received from the rollers. From the lower end of this inclined floor the material is delivered upon an oppositely-inclined screen *g* of such fineness that the flour will pass through while the grain is delivered over the lower end of the screen and falls into a suitably-disposed receiver *h*. The flour passing through this screen falls upon a closed bottom *i*, inclining in the opposite direction from the screen, and is delivered into a suitably-placed receiver *k*. This enables me to separate the grain and flour in a dry condition, so that the barley will not become sour, as it would by moistening, and the crushed barley is thus relieved of all dust, which is detrimental.

In order to properly adjust the crushing-rolls with reference to each other, I have shown the journal-boxes of one of the rollers slidable to and from those of the fixed boxes of the other roller, and a spring U is arranged so that its ends project beyond these movable boxes. Through the ends of this spring extend the screw-threaded pressure-bars V, upon the ends of which are nuts W. The distance to which these bars or rods project through the spring U having been adjusted so that their points rest against the boxes supporting each end of the roller they are then in position to be operated.

X is a centrally-disposed lever-arm the short end of which presses upon the center of the spring U. Through the opposite end of this lever X passes a screw-shaft Y, with a suitable turning wheel or handle, and the end of this shaft presses against a supporting-bar, as shown. When this is turned so as to lift the outer end of the lever, the opposite end will press against the spring U, and thus advance both ends of the adjustable roller simultaneously by the single operation of the screw.

By the use of this apparatus I am enabled to easily transport it from farm to farm where work-crushing is to be done, to drive up to the granary-door, crush any amount from one hundred pounds upward, and as soon as the work is completed to drive on to the next place where the machine is needed without any taking down, disengaging, or loading of separate parts, and by the construction and easy regulation the apparatus is always in readiness for work of any description.

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

1. The combination, of crushing-rolls and means for actuating the same, an elevator-casing having a discharge-spout at one end and a regulated feed-supply at the opposite end, a bucket elevator within said casing and means actuating the same from one of the crushing-rolls, an adjustable gate operating through the elevator discharge-spout between the upper end of the elevator and the crushing-rolls whereby the centrifugal impulse imparted by the elevator at its discharge end and the adjacent gate regulates the supply to the rolls according to the speed of the elevator, and means for adjustably securing said gate.

2. A portable crushing-mill comprising in a single structure, a wheeled base or support; a driving-motor thereon; an elevator and complementary crushing and separating mechan-

isms, mounted on said base and operated by said motor; a gate interposed in the feed-passage between the upper end of the elevator and the crushing devices whereby the centrifugal impulse imparted by the elevator in the half-circle traversed at the upper end, and the adjustment of said gate, determines the distribution of the material to the crushing devices according to the speed of the elevator, and means for adjusting the gate.

In witness whereof I have hereunto set my hand.

HENRY L. JESSEN.

Witnesses:
EDWARD MCCABE,
GEO. JESSEN.