

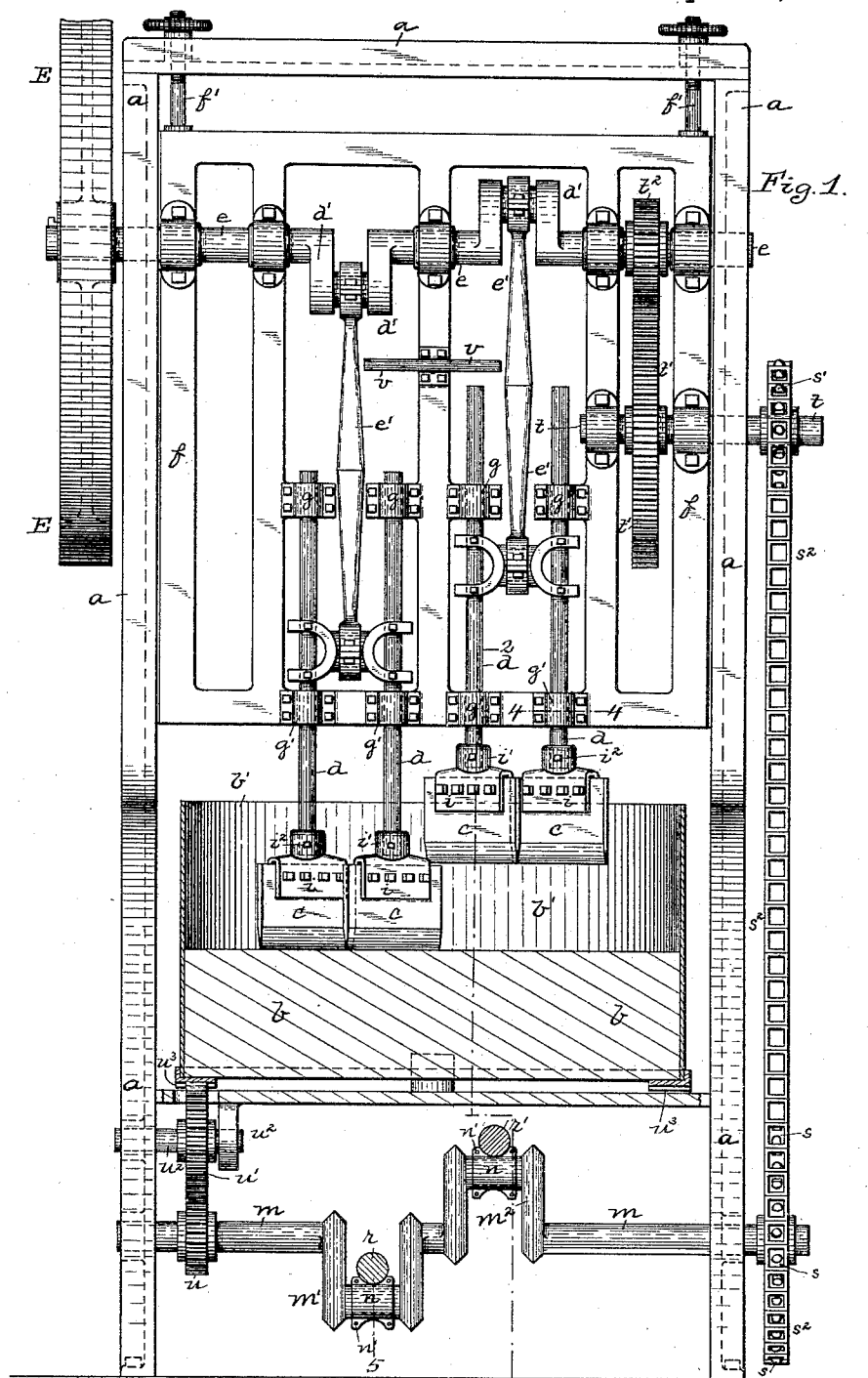
(No Model.)

2 Sheets—Sheet 1.

A. C. RANKIN.
MEAT CHOPPER.

No. 473,779.

Patented Apr. 26, 1892.



Witnesses:
J. H. Cooke
J. J. Kay

Inventor:
Alexander C. Rankin
By James J. Kay
Attorney

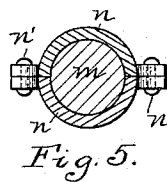
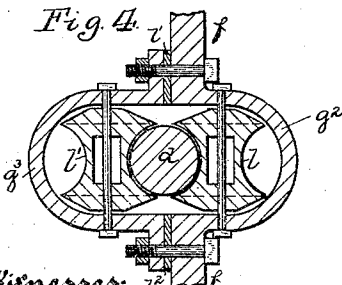
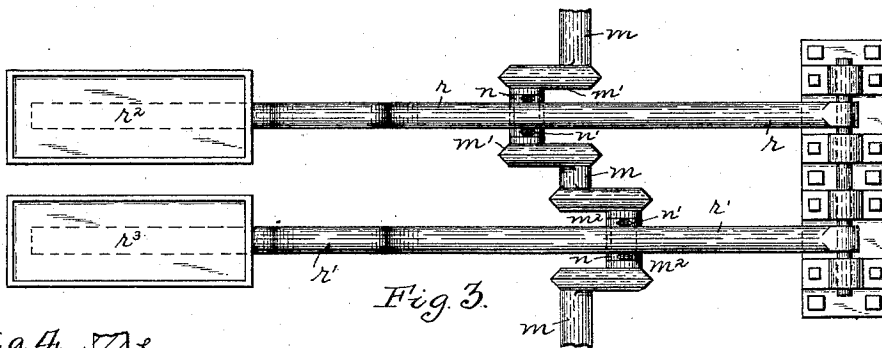
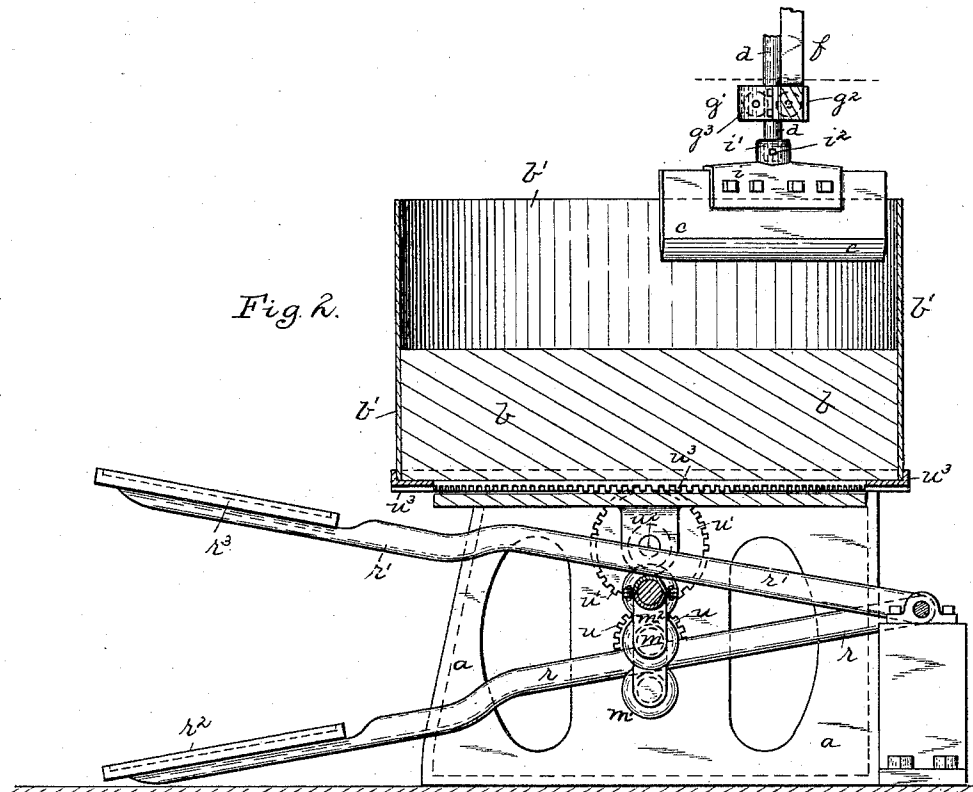
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2 Sheets—Sheet 2.

A. C. RANKIN.
MEAT CHOPPER.

No. 473,779.

Patented Apr. 26, 1892.



Inventor.
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By James H. Ray
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UNITED STATES PATENT OFFICE.

ALEXANDER C. RANKIN, OF GLENFIELD, PENNSYLVANIA.

MEAT-CHOPPER.

SPECIFICATION forming part of Letters Patent No. 473,779, dated April 26, 1892.

Application filed July 30, 1891. Serial No. 401,149. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER C. RANKIN, a resident of Glenfield, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Meat-Choppers; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to what are known as
10 "meat-choppers," its object being to form a meat-chopper which can be driven by foot-power, and to provide mechanism for so operating, as well as to improve the chopper in other particulars. The usual construction of
15 meat-choppers is such that the labor of driving it by hand or man power is severe, and therefore it has generally been found necessary to provide steam-power for operating these choppers. This is of course objectionable, as the ordinary butcher has not any
20 other requirement for steam-power, and it therefore adds considerably to the cost of operating such a machine. By the machine embodied in the present invention the power
25 is applied in such way as to overcome this difficulty, a simple and efficient foot or treadle power being utilized, by which the weight of the person can be employed, and which is simple in construction and in its connection
30 with the meat-chopper, so that the work is not laborious and a power amply sufficient for the purpose is obtained.

Another cost in the construction and operation of these machines is in the mounting of
35 the cutters, and by the present invention a simple, efficient, and cheap construction of guiding mechanism for this purpose is obtained. In applying such treadle-power to the ordinary machine difficulty is found in
40 the adjustment of the parts of the machine, so as to bring the knives in proper position for cutting and to apply the power properly under such conditions; and the principal object of my invention is to overcome such difficulty.

Another object is to provide for the easy and proper grinding of the knives or cutters without requiring the removal of the knives from the knife-holders at each grinding operation and the adjustment of the same upon
50 the knife-holders after sharpening.

In my improvement in meat-choppers I employ a driving crank-shaft carrying a sprocket-wheel, levers fulcrumed back of the crank-shaft and extending over and bearing on the
55 cranks thereof, a vertically-adjustable frame carrying the shaft provided with a sprocket-wheel, a chain connecting said wheels, and the crank-shaft in said vertically-adjustable frame geared to the sprocket-shaft and driving
60 the reciprocating cutter-knives by pitmen. I also employ with such crank-shaft and each pitman operated thereby a cross-head and two or more separate knife-shafts connected to the cross-head, each reciprocating
65 in separate bearings extending above and below the cross-head and each carrying a single knife or cutter, so that a sufficient number of knives for the cutting operation in an ordinary chopper is employed without increasing
70 the number of cranks on the shaft, while each knife is separate and is supported on its own knife-holder and can be removed and sharpened and replaced independently of any other knife, the difficulty of adjustment
75 of the knives upon knife-holders carrying more than a single knife being thus overcome.

To enable others skilled in the art to make and use my invention, I will describe the
80 same more fully, referring to the accompanying drawings, in which—

Figure 1 is a face view of the machine, the block and pan being shown in central section. Fig. 2 is a longitudinal section of the lower
85 part of the machine on the line 2 2, Fig. 1, showing the lever mechanism and the lower ends of the cutter-shafts. Fig. 3 is a plan view of the lower part of the machine, showing the driving mechanism. Fig. 4 is a section
90 on the line 4 4, Fig. 1; and Fig. 5 is a section on the line 5, Fig. 1.

Like letters of reference indicate like parts in each.

The frame *a* of the machine is of the same
95 general construction as the ordinary machine, and secured therein in the usual way is the block *b*, around which is the rim or cylindrical pan *b'* for confining the meat to be chopped upon the block. In the machine illustrated
100 the knives *c*, their shafts *d*, and the crank *d'*, operating the knives through the pitman *e'*,

are mounted in the vertical and adjustable frame *f*, which is adjusted in the main frame *a* by means of adjusting-screws *f'* passing through nuts on the frame, and from which screws the frame is hung, the frame feeding in suitable guideways in the main frame. At one end of the crank-shaft *e* is the fly-wheel *E*, by means of which the speed of the machine is maintained.

Instead of mounting two or more knives on each shaft and connecting each shaft centrally to the cross-head and guiding the shafts only by means of the bearing in the lower ends of the frame *f*, which is the usual construction, I provide a shaft *d* for each knife and mount each shaft in bearings *g g'*, above and below the pitman by which the shaft is operated, so holding each shaft in true line at points some distance from each other and so obtaining a more perfect guiding of the shafts, and to operate two such shafts by each cross-head, so that in a machine having four knives the crank-shaft *e* requires but two cranks with their accompanying pitmen and cross-heads. I connect each knife *C* to one such shaft *d* by means of a knife-holder *i*, such knife-holder having a socket *i'* to receive the end of the shaft and being held thereon by a set-screw *i²*. The knives *c* are adjustable upon the knife-holders by means of slots formed in the knives, the knives being held to the knife-holders by suitable screws. Such construction enables me to remove each knife separately, and each knife is supported on a separate knife-holder, so that the edge thereof can be easily presented to the grindstone for sharpening, and the difficulty heretofore experienced in sharpening the knives where two are mounted on the knife-holder, which requires that the knives shall be removed from the knife-holder for grinding and subsequently adjusted thereon, is overcome. By the present construction each knife can be ground when supported on its knife-holder and immediately replaced upon the knife-shaft *d*, so that no change in the adjustment of the knife upon the knife-holder is necessary. I form the knife-shafts *d* of simple round polished bar, which can be obtained at comparatively low cost ready to be cut to length and inserted in the machine, and may either employ a bearing having a simple round seat for the same or, as preferred by me, may employ roller-bearings for such shafts, the construction of such roller-bearings being shown more particularly in Fig. 4, in which the frame *f* has formed therein pockets *g²*, extending back from the line of the shaft to receive the rollers *l*, mounted in such pockets, and the cap-pieces *g³* have like pockets formed therein in which the rollers *l'* are mounted, the pockets being secured to the frame by suitable bolts, and to provide for adjustment compressible washers *l²*, formed of rubber or like material, being inserted between the body of the frame and the flanges of the cap-pieces, so that a neat adjustment

of the rollers to the knife-shafts is obtained, friction in this way being reduced to the minimum.

Mounted in the lower part of the main frame *a*, underneath the block *b*, is the driving crank-shaft *m*, which shaft has the two cranks *m' m²* formed therein, and around the cranks are formed roller-sleeves *n*, which are made in two halves and fitted around the cranks and held thereon by screws *n'*, as shown in Fig. 5. Such roller-sleeves are desirable, but not necessary for the operation of the driving mechanism. Pivoted or fulcrumed in bearings at the rear of the main frame are the driving-levers *r r'*, these levers having at the forward or free ends thereof the pedals *r² r³*, on which the operator stands in driving the machine, an extremely simple and strong form of driving mechanism being thus obtained, as there is no adjustment of the levers to the cranks, the cranks or their roller-sleeves simply traveling along the lower surface of the levers as the machine is operated, which lever-surfaces may be hardened, if desired, and there being no pins or like small connections to wear.

For driving the machine I employ a sprocket-wheel *s* on one end of the driving crank-shaft *m* and connecting the same to the driving mechanism of the chopper, the connection shown being a shaft *t*, mounted in the frame *f* and carrying at the upper end thereof a sprocket-wheel *s'*, which is connected to the sprocket *s* by the sprocket-chain *s²*, and the shaft *t* carries a gear-wheel *t'*, which meshes with the pinion *t²* on the crank-shaft *e*, mounted in said frame *f*. By such construction the power is transmitted from the crank-shaft *m* to the crank-shaft *e*, and the necessary increase in speed for the driving of the knives is obtained. Any other suitable connection for the purpose may of course be employed.

To rotate the block and pan, I employ on the driving crank-shaft *m* a pinion *u*, which meshes with a larger pinion or gear-wheel *u'* on the shaft *u²*, which is mounted in the frame *a*. To the lower edge of the block or pan I secure an annular rack *u³*, with which the gear-wheel *u²* meshes to turn the same.

In the operation of the machine, after the knives have been properly adjusted so as to touch but not cut into the block either by the adjustment of the frame *f* in the main frame *a* or of the knives upon the knife-holder, the meat to be chopped is placed within the pan and the operator then stands upon the pedals, a handle-bracket *v* being secured to the upper part of the frame *f* or other suitable point in the upper part of the machine, so as to give him the necessary support, and he depresses first one pedal and then the other, soon bringing the machine to a high speed, which is maintained by the fly-wheel *E*, the speed of the crank-shaft *e* and the cutters being increased by the gearing in proportion to the speed of the driving crank-shaft, so that a

high speed of the cutting-knives is obtained. He thus presses down first one pedal and then the other, and the speed of rotation of the fly-wheel is sufficient to overcome his weight and maintain the necessary speed of the machine as he steps from one pedal to the other, a driving mechanism which is exceedingly easily operated being thus obtained, and the weight of the operator's body being brought into play for the operation of the machine, while as the crank-shaft turns under the pressure of the levers the roller-sleeves on the cranks thereof simply travel along the under face of the driving-levers which rest thereon, so that there is little or no friction between the levers and the cranks. The power is transmitted from this driving-shaft through the sprocket *s* and sprocket-chain *s*² to the sprocket *s*¹, and thence through the shaft *t* and gear-wheels *t*¹ *t*² to the crank-shaft *e*, and is imparted from said crank-shaft through the pitmen *b* and cross-heads *c* to the knife-shafts *d*, the mechanism being thus arranged to transmit the power from the driving crank-shaft to the shaft operating the pitmen which is arranged in a vertically-adjustable frame, no matter to what extent such frame may be adjusted, according to the wear on the knives. During the operation the knife-shafts are guided in their movement by the bearings *g* *g*¹, and as they are held in line by these bearings above and below the cross-heads there is practically no wear on the bearings nor opportunity for the knife-shafts to wobble or wear in their movement. At the same time the rollers of the bearings overcome friction, and an easy adjustment of such rollers to the knife-shafts is obtained, while, as the rollers may be cast to shape and the knife-shafts are formed of simple polished round bars, the cost of the same is very low. When it is necessary to grind the knives, all that is necessary is to loosen the set-screws *i*² and remove the knife-holders from the shafts when each knife may be separately presented to the grindstone, and when ground may be brought back to exactly the same position by

means of the sockets and set-screws. The machine is found to operate very rapidly and with little or no friction or wear, and to be efficient for the purpose intended. It is evident that the driving mechanism may be applied to choppers of other construction and like machines.

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

1. In meat-choppers, the combination of a driving crank-shaft carrying a sprocket-wheel, levers fulcrumed back of the crank-shaft and extending over and bearing on the cranks thereof, a vertically-adjustable frame carrying a shaft provided with a sprocket-wheel, a chain connecting said wheels, and a crank-shaft in said vertically-adjustable frame geared to said sprocket-wheel and driving the reciprocating cutting-knives by pitmen, substantially as and for the purposes set forth.

2. In meat-choppers, the combination of a crank-shaft, a pitman, a cross-head, and two separate knife-shafts connected to the cross-head and each reciprocating in separate bearings extending above and below the cross-head, each said knife-shaft carrying a single knife, substantially as and for the purposes set forth.

3. In meat-choppers and like machines, the combination of a driving crank-shaft mounted in the lower part of the machine-frame, driving-levers fulcrumed back of said crank-shaft and extending forward over the cranks thereof, connections from said crank-shaft to the operative mechanism of the machine, and a stationary hand-bracket supported on the machine and extending forward from the upper part thereof above the outer ends of said driving-levers, substantially as and for the purposes set forth.

In testimony whereof I, the said ALEXANDER C. RANKIN, have hereunto set my hand.

ALEXANDER C. RANKIN.

Witnesses:

JAMES I. KAY,
J. N. COOKE.