(No Model.) 4 Sheets—Sheet 1.

L. GENEVOIS.

CHOPPING MACHINE.

No. 499,535. Patented June 13, 1893.

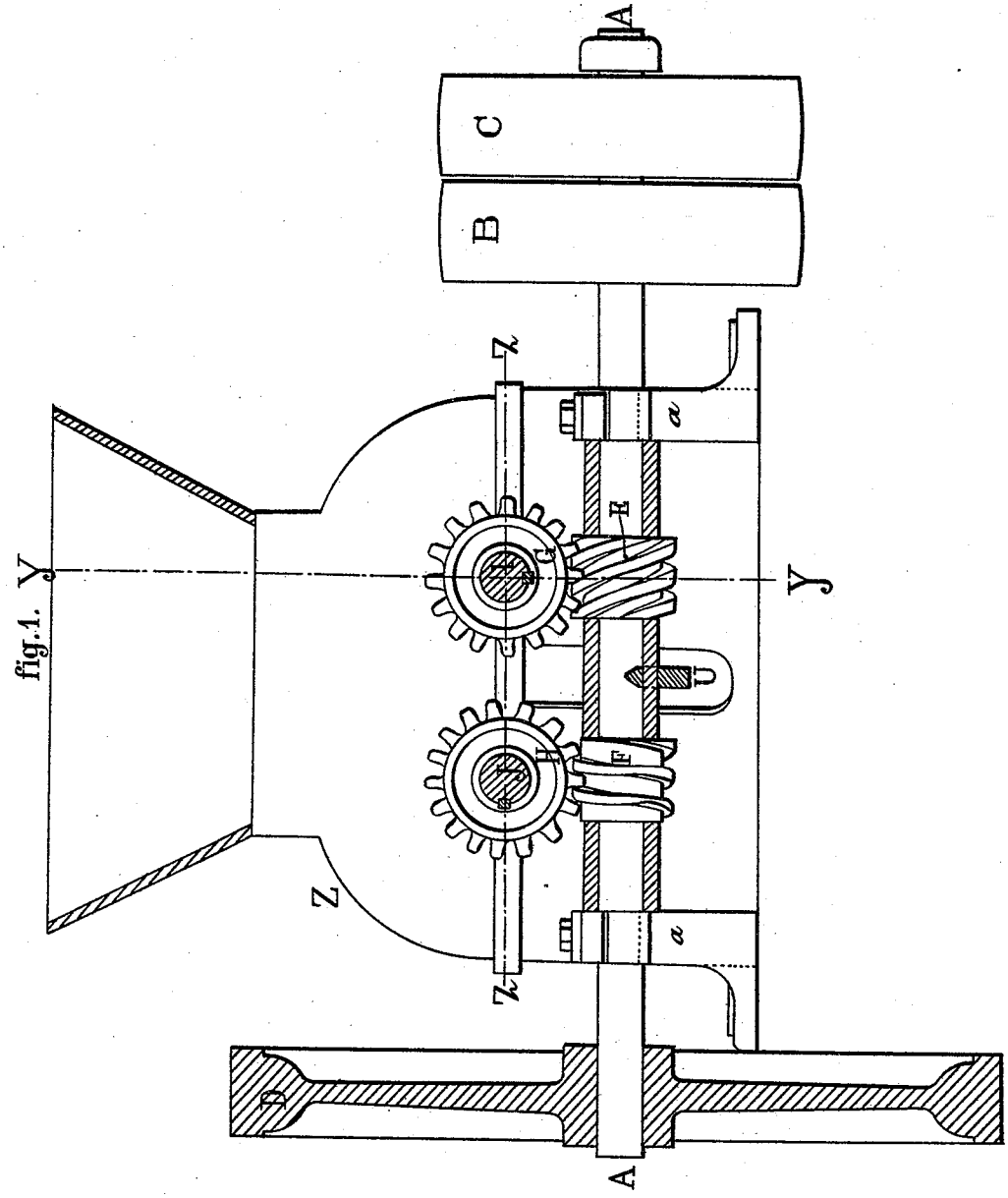

fig. 1.

Witnesses
G. W. Rea
Robt Everett,

Inventor
Louis Genevois
By James L. Norris
Atty

(No Model.) 4 Sheets—Sheet 2.

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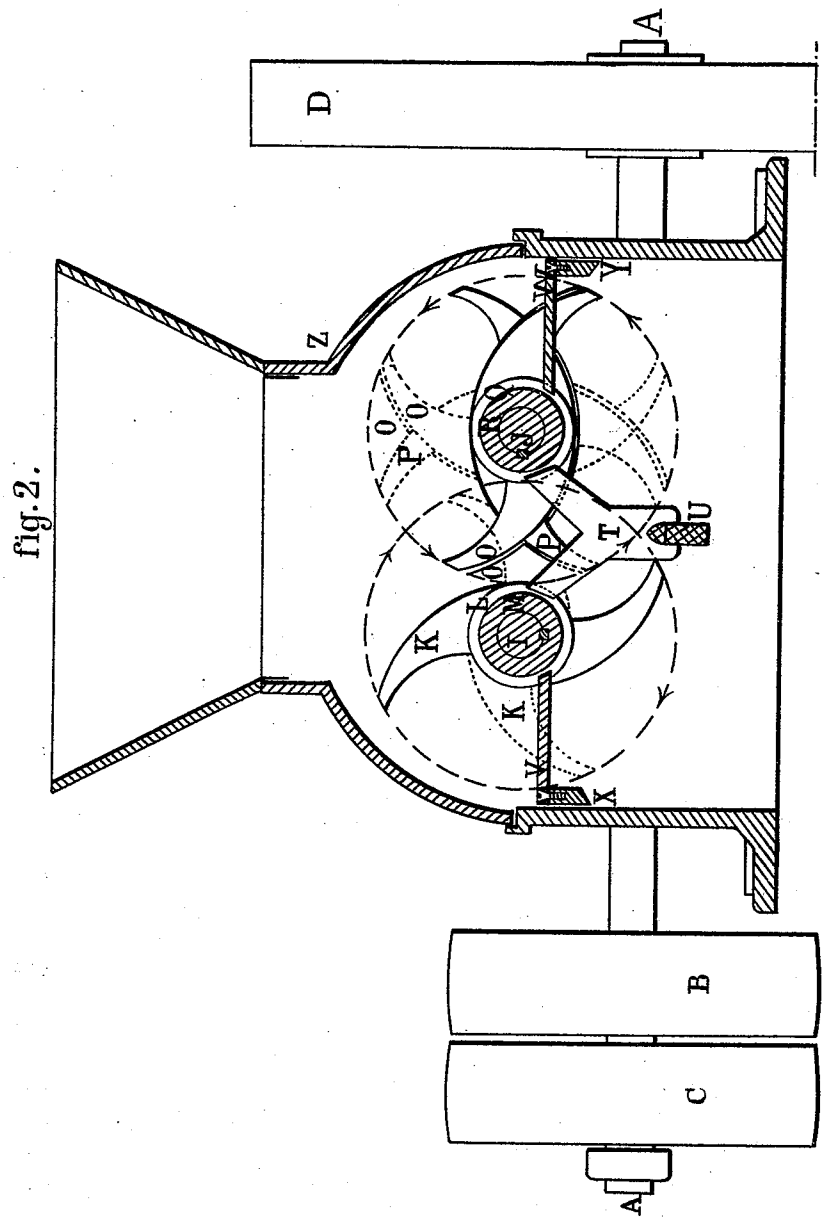

fig. 2.

Witnesses
J. W. Rea.
Robert Everett.

Inventor
Louis Genevois
By
James L. Norris.
Atty.

(No Model.) 4 Sheets—Sheet 3.

L. GENEVOIS.

CHOPPING MACHINE.

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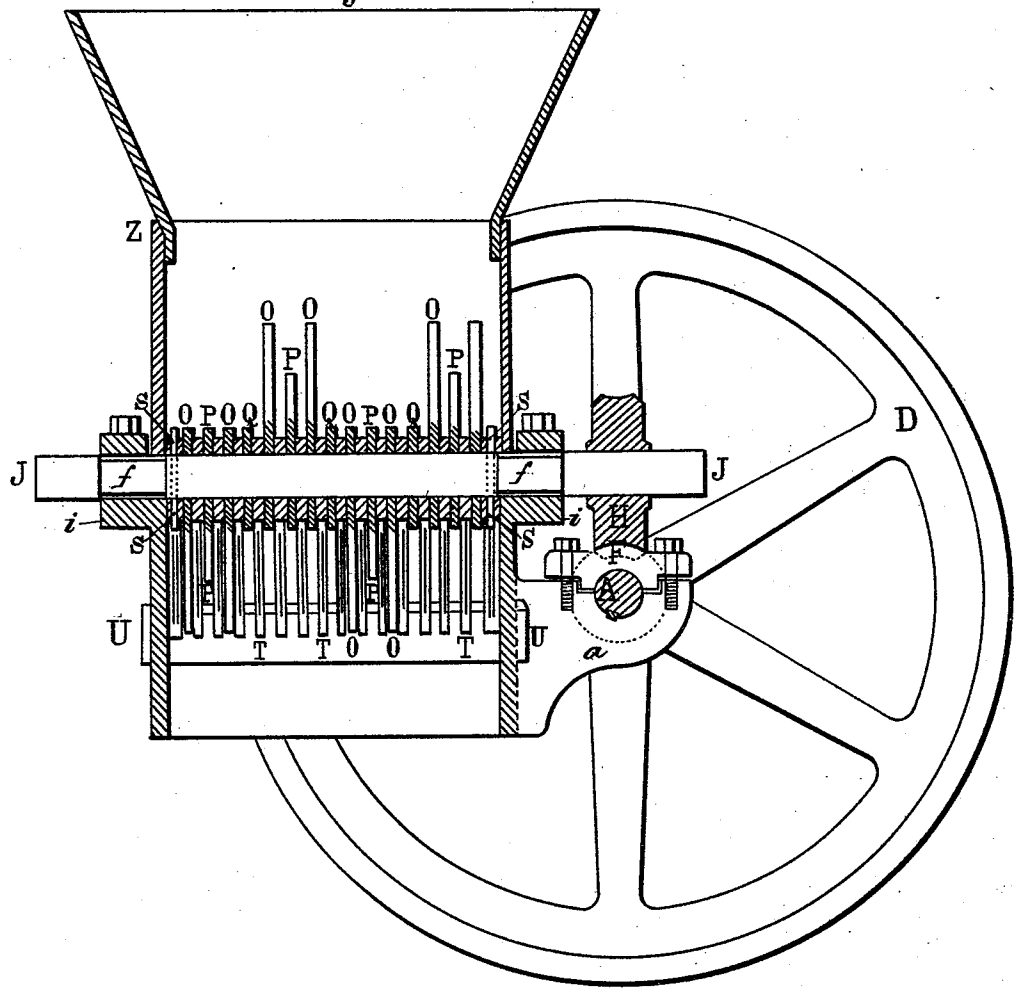
fig. 3.



Witnesses
G. W. Rea.
Robt Everett,

Inventor
Louis Genevois
By Munn & Co
Attys

(No Model.) 4 Sheets—Sheet 4.

L. GENEVOIS.

CHOPPING MACHINE.

No. 499,535. Patented June 13, 1893.

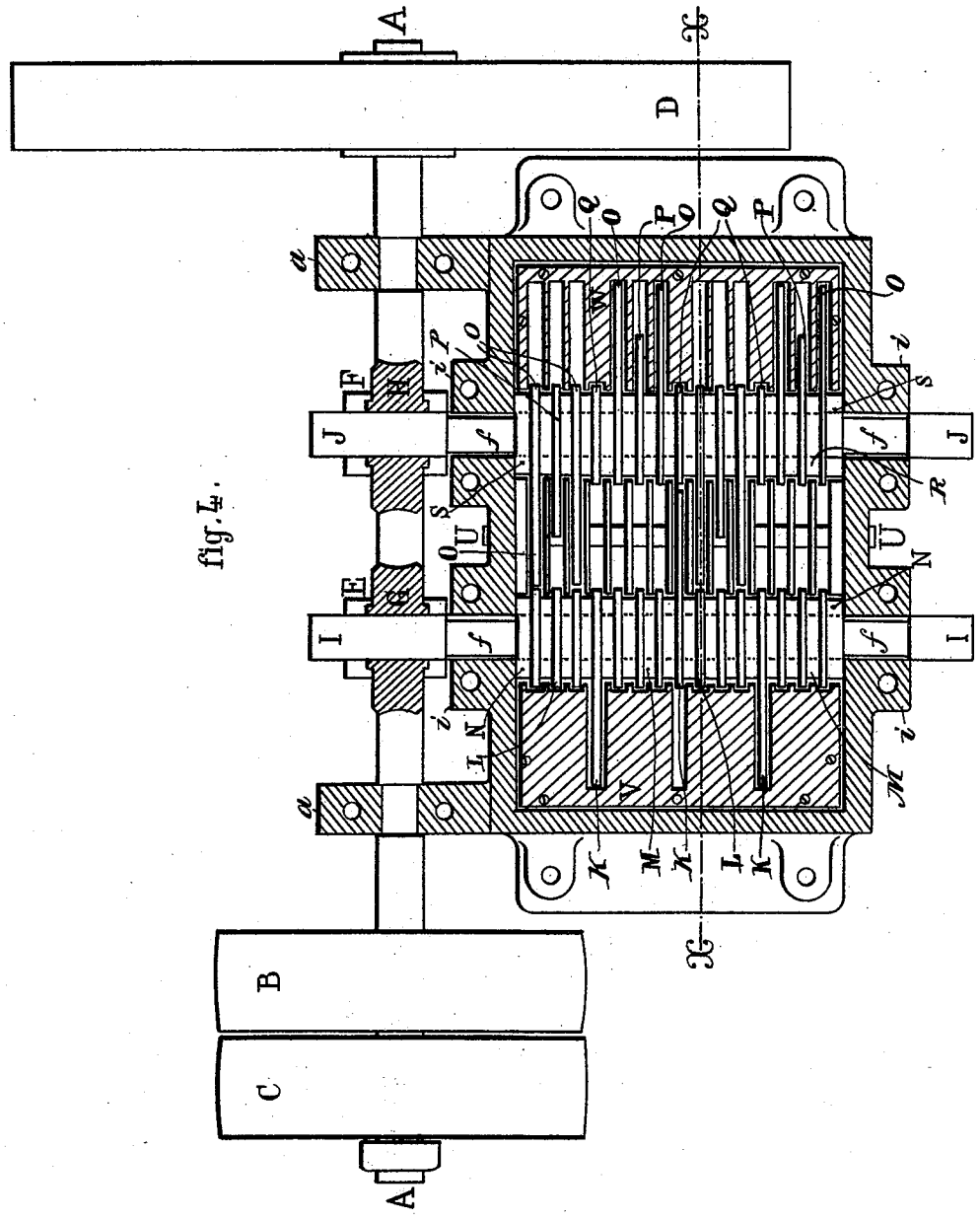


fig. 4.

Witnesses
G. W. Rea.
Robert Everett.

Inventor
Louis Genevois
By Louis L. Norris.
Atty

UNITED STATES PATENT OFFICE.

LOUIS GENEVOIS, OF NAPLES, ITALY.

CHOPPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 499,535, dated June 13, 1893.

Application filed December 20, 1892. Serial No. 455,857. (No model.)

To all whom it may concern:

Be it known that I, LOUIS GENEVOIS, a citizen of France, and a resident of Naples, in the Kingdom of Italy, have invented a certain new and useful Improvement in Chopping-Machines, of which the following is a specification.

My invention relates to improvements in or connected with this class of mechanism, which is used in several industries for cutting up or chopping tallow, grease, meat, skins and other like materials. It has been found in practice that raw tallow delivered from slaughter houses or butchers' shops gives, when properly chopped, a larger and better yield, which is produced with a less expenditure of fuel than is possible when the material is not previously chopped. By accurately testing this class of materials when divided or chopped by the machines heretofore used, it will be readily ascertained that the chopping is more or less incomplete, this fact being shown by the comparative difference in the quantity of margarine, tallow or other products which remain in the refuse or residue and it is only by the application to said refuse, or residue, of the said treatment and by resorting afterward to chemical agents that the margarine and other products may be wholly extracted.

In order to extract a percentage of margarine as large as possible when shamble-tallow is treated, or when prepared unmelted tallow of good quality is employed, or even in the treatment of the common or ordinary tallow, a practical machine is necessary, which will rapidly and completely chop either the gross tallow or the suet to the requisite degree, without requiring a preliminary cutting or chopping of said materials.

To provide a chopping machine having the capacity of accomplishing these results is the main purpose of the present invention.

To enable others skilled in the art to fully understand and to practice my said invention, I will now describe the same in detail, referring for such purpose to the accompanying drawings, in which I have illustrated a preferred type of mechanism, and in which—

Figure 1, is a front elevation partly in vertical section showing a chopping machine designed according to my invention. Fig. 2, is a longitudinal vertical section of the same, made upon line *x—x* of Fig. 4. Fig. 3 is a transverse section made upon line *y—y* of Fig. 1. Fig. 4 is a horizontal section made upon line *z—z* of Fig. 1.

My improved chopping machine consists of a housing or casing Z provided externally with two supporting brackets *a* on which rest the bearings of the main shaft A which is provided with fixed and loose pulleys B and C. Said shaft A is provided with a suitable fly-wheel D, to equalize its movement and between the two brackets *a* projecting from the front of the housing Z and supporting the main shaft A, are two, independent worms E and F, both rigidly mounted upon said shaft. These worms have both opposite and different pitch, or, in other terms, the one is a right hand and the other a left hand thread, and the obliquity of one to the axis of the main shaft is considerably greater than the obliquity of the other. Both worms being rigidly mounted upon the said main shaft, they will rotate in unison and with the speed of the shaft.

Upon the front and rear walls of the housing Z are formed or mounted projecting boxes or supports *i*, *i*, in which rest the journals *f* of shafts I and J, said journals being slightly reduced in diameter, as compared with the bodies of the shafts, in order to prevent longitudinal play of said shafts. The supporting boxes *i*, *i*, are arranged transversely in the housing Z, beyond the outer face of which they project sufficiently to receive worm-gears G and H, having substantially the same diameter and meshed, respectively, with the worms E and F. By reason of the difference in pitch of the said worms, the worm-gears will receive from the main shaft A a differential speed of revolution. While this is a matter subject to more or less variation, I prefer, as the result of practical experiment, to differentiate said worms in the ratio of one to five, thereby giving to one of the two shafts driven by said worms a speed five times greater than that of the other shaft.

Upon the shaft I, which is represented in the drawings as being that having the greater speed, I rigidly mount three blades K, K, K, substantially equal intervals being formed between the said cutters and between the latter and the two ends of the shaft on which

they are mounted. Upon the same shaft I are also mounted twelve disks L, equal in thickness to the blades K, or substantially so, and separated from each other and from the blades K by means of rings M of suitable thickness. These rings are fourteen in number, and at each end of the said shaft, outside the outer disk L, is placed a thicker ring N, the purpose being to clamp the blades K, disks L and rings M together, and render the entire series practically rigid with the shaft.

Upon the other parallel shaft J are mounted twelve blades, designated in the drawings by the reference-letters O and P. These twelve blades are substantially similar in form and proportions but are arranged in four different groups or gangs, each group having three of said blades. The members of each group are arranged upon the shaft J at substantially equal intervals, and the four groups of said blades are, when said groups are considered individually, placed at substantially the same distance, one from another, one of said groups being placed at, or near, each end of the shaft J. The members in each group, also, are so placed that two thereof shall have practically simultaneous action, while the third member has operation a little in advance of said two members.

The blades last named are indicated by the reference-letter O, and the single member, which lies between, and acts in advance of the said blades O, is denoted by the letter P. Each of the twelve blades O—P, upon shaft J is arranged substantially in the same plane of revolution with one of the twelve disks L, on the shaft I, and by means of this arrangement the blades K upon said shaft I are caused to alternate with, or have their planes of revolution in the intervals separating the several groups or gangs of blades O, P, as shown in Fig. 4. Moreover, the shaft J, is provided with three disks Q, which are arranged upon said shaft in substantially the same planes of revolution with the three blades K upon the parallel shaft I. The several blades O—P, and disks Q are separated from each other by means of rings R, of equal thickness, fourteen of such rings being provided beside two thicker rings S, placed at the ends of the shaft J and pinned thereto, in order to rigidly clamp the blades O, P, and disks Q rigidly upon the shaft. By the arrangement thus far described it will be seen that the blades K of the one shaft are placed in the same vertical planes with the disks Q of the other shaft, while the blades O—P, of the shaft last referred to lie in the same vertical planes as the disks L on the shaft carrying said blades K.

Between the two parallel shafts I and J are arranged Y-shaped blades, or cutters T, their central stems from which the arms of the blades diverge being provided with notches at their lower ends, to enable them to be detachably straddled upon a supporting bar U, which lies parallel with the axis of the shafts I and J, and substantially midway, though considerably below the horizontal plane, of said shafts. The ends of the diverging arms of said Y-shaped blades are beveled off to rest loosely against the peripheries of the rings M and R the thickness of said arms being substantially equal to the similar dimension of said rings. By this arrangement the ends of the said diverging arms are brought between the disks L and Q, and as these have a diameter exceeding that of the rings M and R, any lateral displacement of said blades will be effectually prevented. The inclination of the diverging blades T, between which the disks L and Q and the blades O, P, and K pass, causes a shearing cut between the edges which act in unison. The blades K are mounted upon the shaft having highest speed of revolution, and by these blades the material is slashed and chopped into pieces and at the same time is carried around by the slow-moving blades O, P. When said material is chopped to the required degree, it is stopped, or held, by the comb-plates V and W, which are arranged substantially in the horizontal plane of the axes of the shafts I and J and supported upon the interior of the housing Z by brackets X and Y. Said comb-plates extend from the end walls of the housing to the adjacent sides of the shafts I and J, respectively, or as near the same as is consistent with the proper action of the machine. Said comb-plates are provided with slots of a length and width to permit the free passage of the blades K on the shaft I and the groups of blades O, P, on the shaft J. Upon the edges of said comb-plates notches are also provided for the disks L and Q, as shown in Fig. 4.

Steam may be thrown into the interior of the housing Z by any well known means. The disks and blades carried by the shafts I and J may be of varying thickness, and variation in this dimension the degree of fineness to which the chopping is carried will be correspondingly varied. The housing Z is formed in two parts, the upper portion forming a removable cover and being provided with a hopper of the ordinary kind.

By employing this machine, a large quantity of perfectly chopped material may be rapidly obtained without having been previously cut, whereby the expense of preparatory machines or preliminary labor may be avoided. Moreover the rapid working of the machine gives the advantage of employing fresh raw materials and of manufacturing a fresh chopped product without the lapse of sufficient time for decomposition to take place, or for the meat to become stale.

This chopping machine is not only intended to treatment of raw tallow for the manufacture of margarine, or of stearine, in candle or soap-works, &c., but also to the treatment of grease for refined lard, pomatum, and other purposes, of meats in pork-bucheries, of fish, for the extraction of fish-oil, of fruits for making preserves, cider and wine, of vegetables,

for manufacturing conserves, of flowers and similar substances for making perfumes, of distillery-products, of skins and tan-yard scraps for manufacturing glue and, generally, of any material contained in cells of adipose tissue.

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

1. In a chopping machine, the combination with a suitable housing, of two shafts carrying suitable cutting devices and provided with worm-gears, and a main shaft having two worms of different and opposite pitch, meshing with said worm-gears, whereby the cutting devices upon the respective shafts operated at different speeds, substantially as as described.

2. In a chopping machine, the combination with a suitable housing, of two parallel shafts one having a plurality of blades separated from each other by a series of disks and acting in succession, and the other shaft having a plurality of groups or gangs of blades with disks arranged on said shaft between the groups, a series of Y-shaped cutters, or blades, arranged between said shafts and mechanism for driving said shafts in opposite directions and at different speeds, substantially as described.

3. In a chopping machine, the combination with two parallel shafts having suitable blades and disks mounted thereon, of Y-shaped cutters, or blades, having their diverging arms arranged between said shafts and their central stems detachably mounted upon a support lying below the said shafts and parallel with their axes, substantially as described.

4. In a chopping machine, the combination with two parallel shafts each having suitable blades, of a series of Y-shaped cutters, or blades, the diverging arms of which are arranged between said shafts with their ends supported thereby intermediately of the blades, the central stems of said Y-shaped cutters or blades being notched to straddle a supporting bar arranged centrally between, but below the plane of the axes of said shafts, substantially as described.

5. In a chopping machine, the combination with a suitable housing, of two parallel shafts one having blades arranged separately at uniform intervals with a series of disks between said blades, and the other shaft having a plurality of groups of blades and intermediate disks, a series of stationary cutters or blades arranged between said shafts, and comb-plates arranged substantially in the same horizontal plane with the axes of the two shafts and extending from the end-walls of the housing to the adjacent sides of the shafts, suitable slots and notches being provided for the blades and disks, substantially as described.

6. In a chopping-machine, the combination with a suitable housing of two parallel shafts arranged therein and having cutting devices mounted thereon, a series of Y-shaped cutters, or blades, the diverging arms of which are arranged between said shafts, and a main shaft having two worms of different and opposite pitch meshing with worm gears upon the parallel shafts, substantially as described.

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

LOUIS GENEVOIS.

Witnesses:
JULES GENEVOIS,
TEHRE DUTERRAIL.