(No Model.) 4 Sheets—Sheet 1.

W. G. BELL.

MEAT CUTTING MACHINE.

No. 303,795. Patented Aug. 19, 1884.

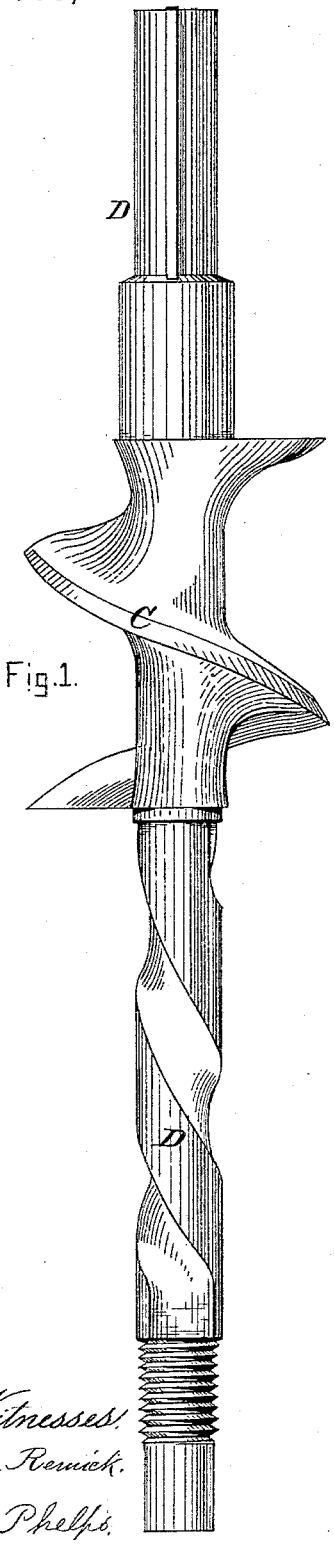

Fig. 1.

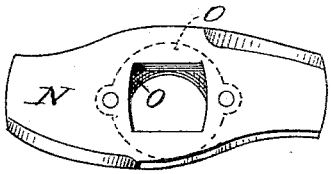

Fig. 2.

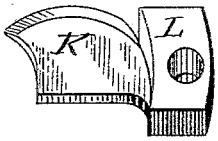

Fig. 8.

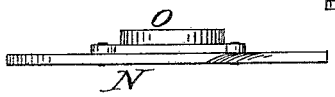

Fig. 3.

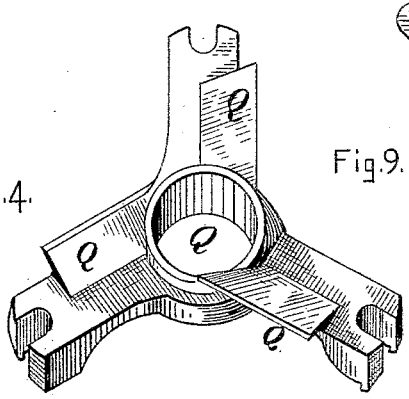

Fig. 4.

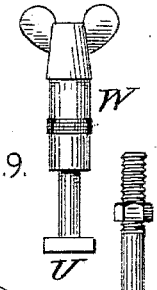

Fig. 9.

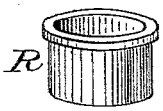

Fig. 5.

Fig. 10.

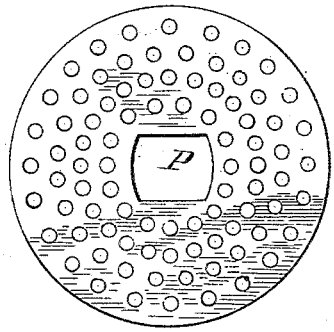

Fig. 6.

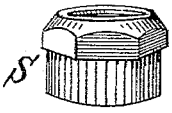

Fig. 7.

Witnesses:
H. E. Renick.
E. A. Phelps.

Inventor:
William G. Bell.
by A. H. Spencer
his attorney

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W. G. BELL.

MEAT CUTTING MACHINE.

No. 303,795. Patented Aug. 19, 1884.

Fig.11.

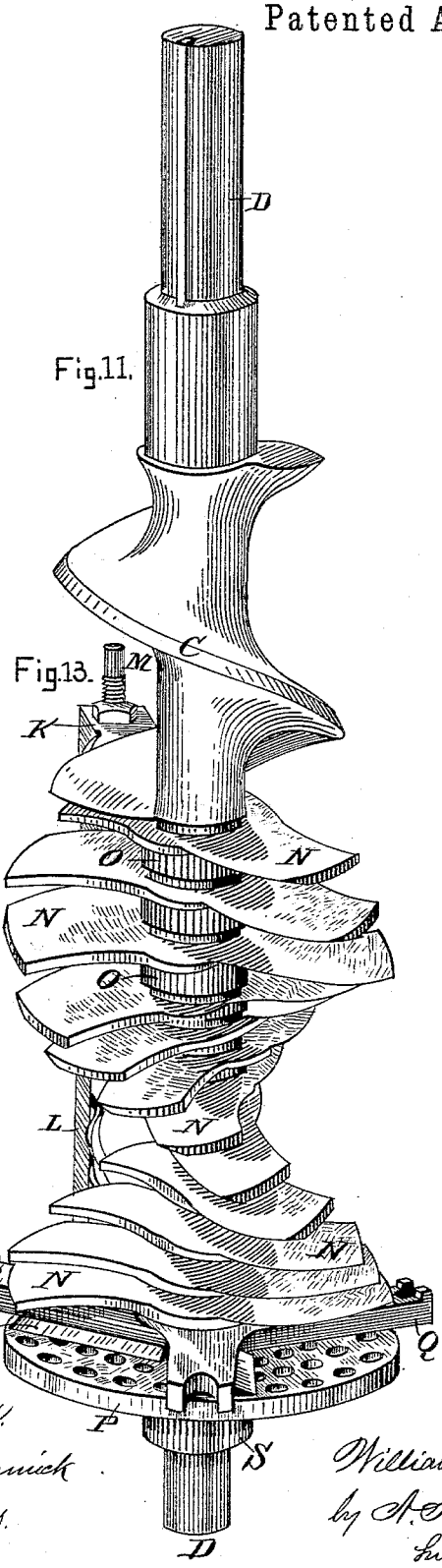


Fig.12.

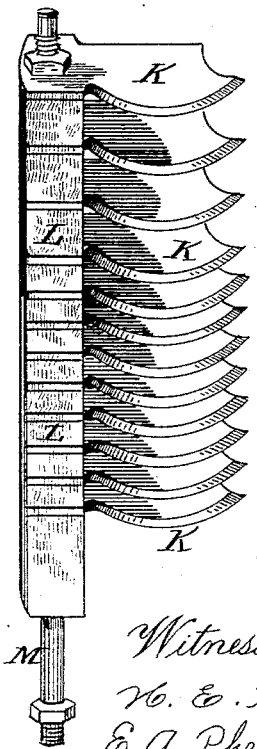
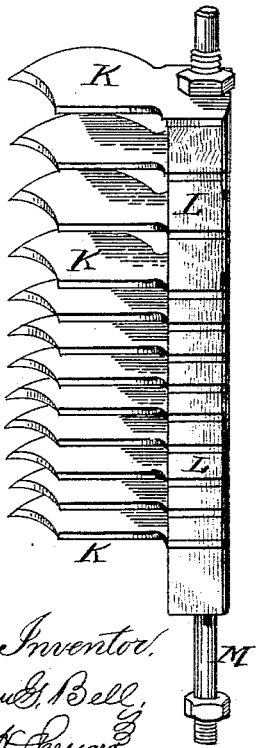


Fig.14.



Witnesses.
H. E. Renick
E. A. Phelps.

Inventor.
William G. Bell,
by A. H. Spencer
his attorney

(No Model.) 4 Sheets—Sheet 3.

W. G. BELL.

MEAT CUTTING MACHINE.

No. 303,795. Patented Aug. 19, 1884.

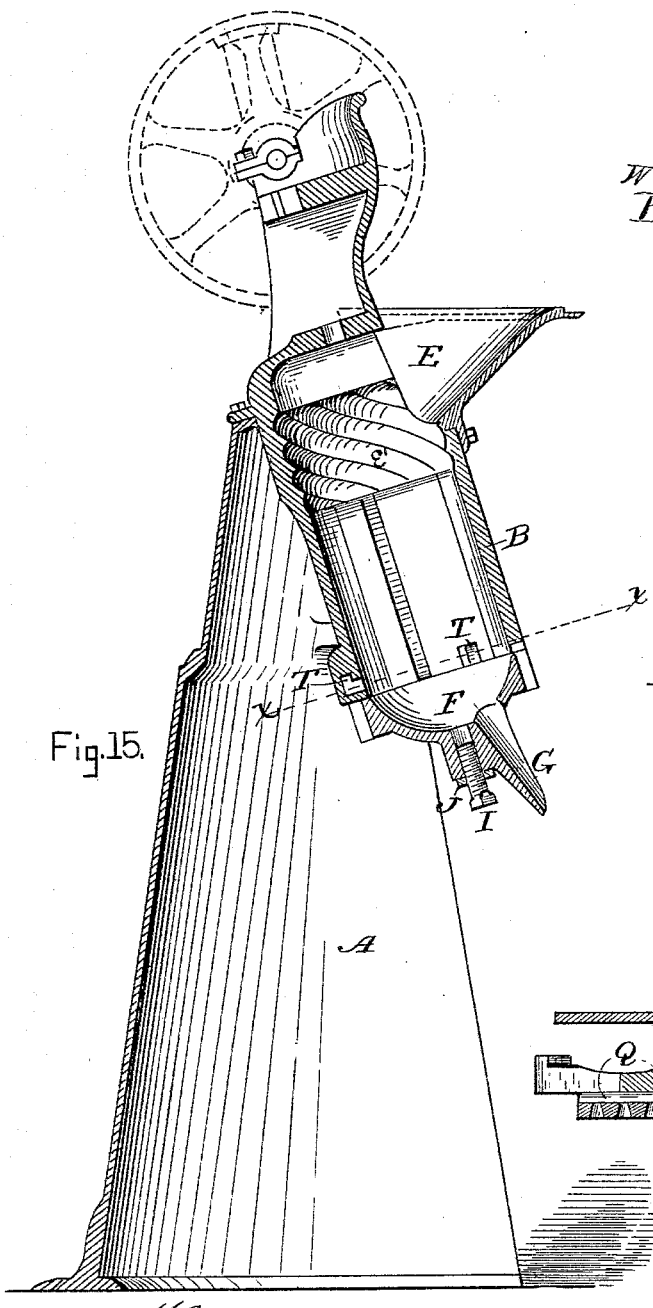


Fig. 15.

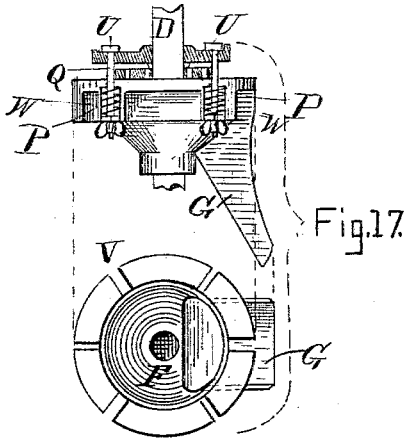


Fig. 17.

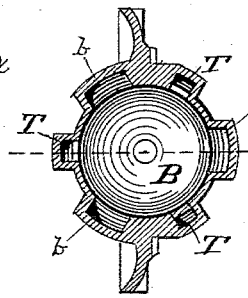


Fig. 16.

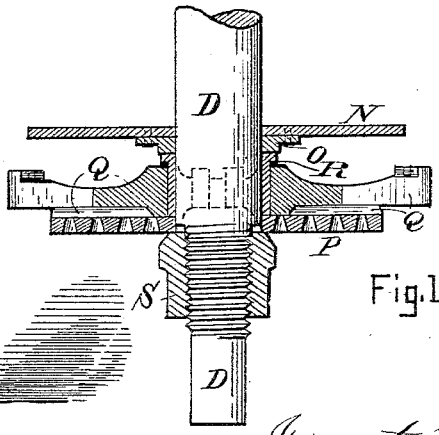


Fig. 18.

Witnesses.
H. E. Renwick.
E. A. Phelps.

Inventor.
William G. Bell
by A. N. Renwick
his attorney

(No Model.) 4 Sheets—Sheet 4.

W. G. BELL.

MEAT CUTTING MACHINE.

No. 303,795. Patented Aug. 19, 1884.

Witnesses.
H. E. Rennick.
E. A. Phelps

Fig. 19.

Inventor.
William G. Bell
by A. H. Peirce
his attorney

UNITED STATES PATENT OFFICE.

WILLIAM G. BELL, OF BOSTON, MASSACHUSETTS.

MEAT-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 303,795, dated August 19, 1884.

Application filed December 15, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM G. BELL, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Meat-Cutting Machines; and I do hereby declare that the same are fully described in the following specification and illustrated in the accompanying drawings.

This invention involves various improvements upon the meat-cutting apparatus for which Letters Patent of the United States were granted to me February 27, 1883, No. 273,220, and October 23, 1883, No. 287,360.

These improvements relate to a stationary clearing-knife working in conjunction with a rotary perforated disk at the base of the cylinder; to a cylinder recessed to receive the extremities of the radial arms of said knife, (or the devices by which they are held stationary,) and additionally recessed to receive the shanks of the series of cutting-blades which coact with the series of revolving cutters; to means of tightening or adjusting the stationary clearing-knife to the rotary perforated disk independent of the primary cutting-blades, and also to a discharge-spout, an oblique cylinder, a detachable hopper, an adjustable bearing for the cutter-shaft, a shipping mechanism, and to other features.

My invention consists in the devices and combinations of devices set forth in the appended claims.

In the drawings, Figure 1 represents the feed-screw and cutter-shaft. Figs. 2 and 3 show one of the rotary cutters and its collar. Fig. 4 is the stationary clearing-knife inverted; Fig. 5, the sleeve; Fig. 6, the perforated disk; Fig. 7, the tightening-nut for the rotary shaft. Fig. 8 is one of the stationary cutters, and Fig. 10 the rod on which a series of them is mounted, while Fig. 9 is one of the yielding fastenings for the clearing-knife. Fig. 11 shows the cutter-shaft with the rotary cutters and disk and the stationary clearing-knife in position. Figs. 12, 13, and 14 represent the three series of stationary cutters which co-operate with the rotary ones. Fig. 15 is a view of the standard and of the oblique cylinder in section, (the cutters removed.) Fig. 16 is a transverse section of the cylinder at the line *x x* of Fig. 15. Fig. 17 is a view of the removable cylinder-head, and Fig. 18 a section of the lower end of the rotary shaft and parts thereon. Fig. 19 is a perspective view of the machine complete.

For my large-sized machines I provide a standard, A, cast with a broad open base to admit the tub which receives the cut meat. On this standard the entire apparatus is mounted, together with the driving mechanism, as best shown in Figs. 15 and 19.

The cylinder B, preferably placed obliquely, about as shown, is bolted to the standard A, and is cast hollow in a single piece, including its upper end, through which protrudes the stem of the feed-screw C, the prolongation of which forms the cutter-shaft D. The hopper E is, however, made detachable, and united by bolts to the upper end of the cylinder, where a suitable opening is formed in the casting. One object in forming the hopper separate from the cylinder is to facilitate finishing it with a porcelain lining without sending away the cylinder also. Such lining of the hopper gives a free movement of the meat from it into the cylinder, and this is also facilitated by the oblique position of the cylinder, bringing the hopper directly above it. The lower end of the cylinder is closed by the removable cylinder-head F, held in position preferably by hooks H, pivoted to the cylinder, as shown in my former patents. This head F is provided with a projecting spout, G, which serves to discharge the cut meat toward the center of the tub. Through the center of the head a vertical screw, I, rises to form an axial support and bearing for the cutter-shaft, and a check-nut, J, will usually be provided to insure its adjustment.

The cylinder B is cast with three elongated radial recesses, *b*, for the reception of the shanks of three series of stationary knives, K, and their space-blocks L, arranged upon rods M, alternately therein, so as to hold said knives in position to co-operate with the two-edged rotary knives N, arranged spirally upon the flattened shaft D, alternating with the annular collars O, which serve as space-blocks. This construction as to the knives will be clear from Fig. 11, while the recesses of the cylinder are best shown

in Figs. 15 and 16. The entire cutting apparatus is removable with the head F from the cylinder for cleaning out and for sharpening the cutters. Each cutter has a space-block or collar riveted to it, and I provide for the most accurate adjustment of the cutters of a pair—that is, that the proper shearing action shall occur between each rotary blade and the stationary cutter appertaining thereto—by forming the blades and cutters from sheet-steel of uniform gage, riveting to them the space-blocks L or collars O, and then milling the blocks and collars to correspond absolutely with each other, that the cutting-edges may coincide.

Below the rotary cutters N, and revolving with them on the shaft D, is a rotary perforated disk, P, and above or below it a stationary knife, Q, (in this instance above the disk,) and having three radial arms, each forming or supporting a cutting or clearing blade to keep the face of the disk free from clogging, and to sever any strings or uncut fibers that might otherwise lodge in or about the perforations. This clearing-knife Q has a central circular aperture for the shaft D to revolve in, and also to receive loosely the annular sleeve R, which surrounds the shaft at that point. This sleeve is interposed between the rotary cutters N and disk P on the shaft, and serves to transmit from the disk to the cutters through the aperture in the knife Q, the pressure exerted by the nut S, screwed upon the lower portion of the shaft, so as to tighten to the shaft all the parts that rotate with it without binding the knife Q to the disk P. The clearing-knife Q is held stationary by being secured to the cylinder or its cap or head. The means shown in the drawings are adequate, and consist of recesses T in the cylinder-walls midway between the longer recesses, which receive the block-knives K. The ends of the arms of knife Q enter these recesses. Adjustable pressure of the knife Q upon the perforated disk P is obtained by connecting-bolts U, which rise from the cylinder-head F, to engage with the extremities of the arms of said knife, and are provided with thumb-nuts engaging with the head F, which is perforated or recessed, as at V, to receive the bolts U. This pressure is made elastic by interposing a spring or yielding washer, W, between the head and nut of said bolts U. (See Fig. 9.)

The cylinder B is bored out axially true, so that, without striking, the cutters N will run in close proximity to its walls, and will cut the meat more rapidly and with less loss of power than in ordinary machines having unfinished cylinders. The feed-screw C also runs close to its part of the cylinder, and is sharpened peripherally to a cutting-edge, giving it the double capacity of feeding and cutting the meat introduced from the hopper. The interior spiral grooves, E', at the upper end of the cylinder, are of sharper pitch than usual heretofore, and are gradually merged into the cylindrical portion. Above this part the grooves deepen or extend outwardly from the axis, leaving only the apex of each thread coinciding with the prolongation of the cylindrical bore. This construction gives the cylinder a uniform minimum diameter throughout, and greatly enlarges the capacity of the feed-screw and of the entire machine.

Y is the shipping-lever, which actuates the clutch by a rod through the tubular shaft Z.

I claim as my invention—

1. In a meat-cutting machine, a rotary shaft carrying a perforated disk, in combination with a stationary clearing-knife having a central aperture through which said shaft rotates, and with means, substantially as described, for adjusting the pressure of said disk and knife, for the purpose set forth.

2. In a meat-cutting machine, a rotary shaft and feed-screw and a perforated disk revolving therewith, in combination with a stationary clearing-knife adjusted to the face of said disk by yielding connections independent of the other tightening devices, for the purpose set forth.

3. In a meat-cutting machine, a hollow cylinder, two or more series of stationary knives, and a stationary clearing-knife having a central aperture and radiating arms, in combination with a rotary shaft, a series of rotary cutters, a perforated rotating disk, a sleeve, and an annular nut for tightening said disk, sleeve, and cutters on the shaft, for the purpose set forth.

4. In a meat-cutter, the rotating feed-screw and cutter-shaft and the perforated disk revolving therewith, in combination with the series of stationary cutting-blades, the fixed clearing-knife, the annular sleeve and nut, and the cylinder-head, all removable together from the cylinder, substantially as and for the purpose set forth.

5. In a meat-cutter, a hollow cylinder formed in a single piece, with longitudinal recesses to receive two or more series of stationary cutting-blades, and additionally recessed at intermediate points to receive the arms of a fixed clearing-knife, and having spiral groove at its upper end, the diameter of the cylinder at the apex of the threads being the same as that of the body of the cylinder, substantially as described.

6. The cylinder having in its lower part a smooth bore, broken by recesses for the stationary knives, and in its upper part a series of sunken spiral threads, the apexes of which are in the same plane as said bore, and the outward depressions between them tapered inwardly and downwardly to and disappearing in said plane, whereby a feed-screw of a diameter equal to that of the rotary knives may be employed, and the capacity of the machine thereby increased, substantially as set forth.

In testimony whereof I hereto affix my signature in presence of two witnesses.

Witnesses: WILLIAM G. BELL.
A. H. SPENCER,
E. A. PHELPS.