Dec. 17, 1935. S. T. FREAS 2,024,918

BEET KNIFE

Filed March 6, 1934 2 Sheets-Sheet 1

Fig. 3.

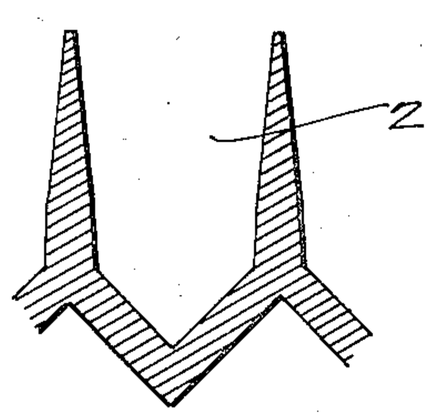
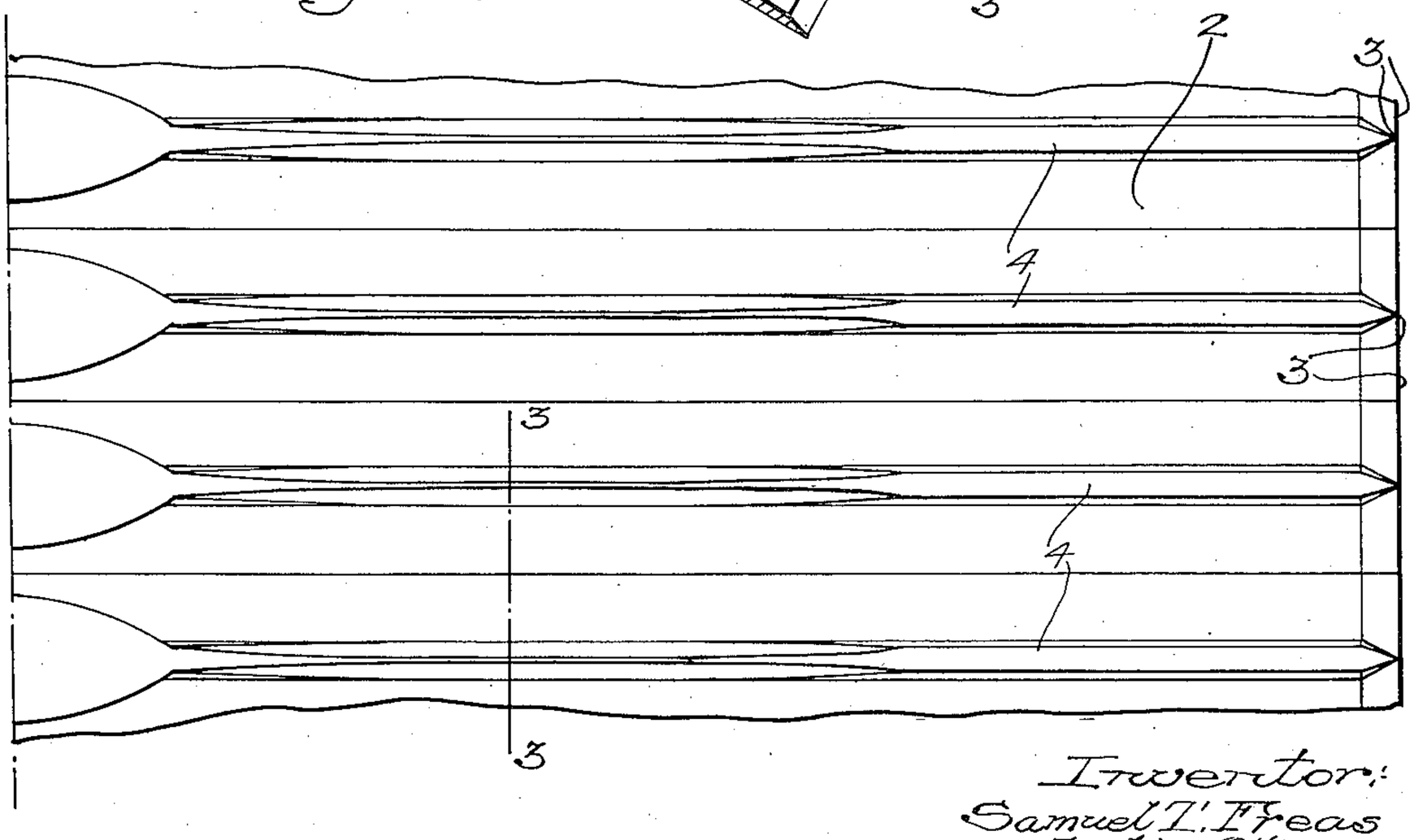


Fig. 1

Fig. 2.



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2 Sheets-Sheet 2

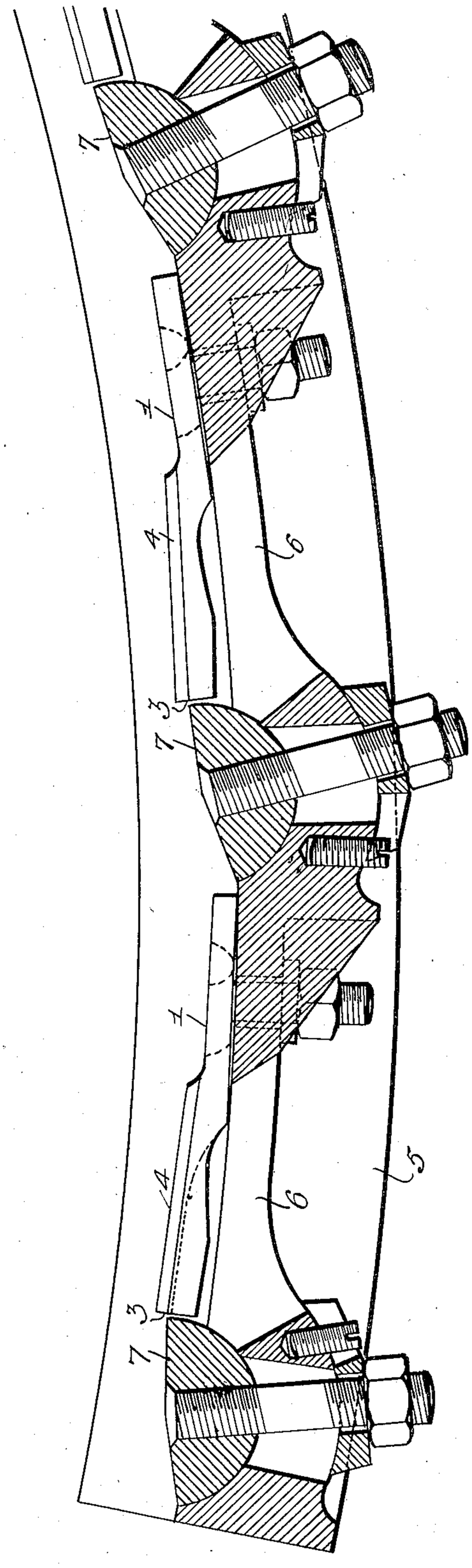


Fig. 4.

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UNITED STATES PATENT OFFICE

2,024,918

BEET KNIFE

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Application March 6, 1934, Serial No. 714,343

5 Claims. (Cl. 146—129)

This invention relates to improvements in beet knives, and the principal object of the invention is to provide a knife of the stated character that shall be generally more efficient in operation than knives of the prior form.

In the attached drawings:

Figure 1 is a fragmentary sectional perspective view of a knife made in accordance with my invention;

Fig. 2 is an enlarged fragmentary plan view of the knife;

Fig. 3 is a section on the line 3—3, Fig. 2, and

Fig. 4 is a fragmentary sectional view of that portion of the beet-cutting apparatus in which the beet knives are mounted.

With reference to the drawings, 1 is the body of the knife which is accordance with the usual practice is formed at the front end with a plurality of channels 2 which terminate in the cutting edge 3 of the knife. In operation, these knives cut the beets into elongated strips which pass back through the channels 2 and are discharged from the rear ends of the latter.

In the process of extracting sugar from the beets, it is desirable that these strips be as long and as uniform as possible, and it is therefore essential that the strips be permitted to escape freely from the channels, since any tendency of the strips to bind or clog in the channels destroys the continuity of the strips and interferes with efficient operation of the knives. It has been proposed as a means for preventing binding of the strips in the channels to reduce the height of the walls 4 of the channels from their upper edges towards the rear ends of the channels, but I have found that if the walls are cut down in this manner to the extent required for substantially effective results, the strength of the knife is impaired to a degree rendering the blade flexible under the conditions of use, which precludes efficient operation of the knife in cutting the beets into uniform strips.

This will be more readily understood from Fig. 4 of the drawings. In practice, the knives may be mounted on the inside of a rotary cylindrical drum, one section of which is shown at 5. The forward ends of the knives overlie openings 6 in the drum, and gauge bars 7 are adjustably supported in the drum closely adjacent the forward or cutting edges of the knives and afford a means for regulating the size of the severed beet strips. The beets are massed in the interior of the drum and the free ends of the knives are unavoidably subjected to the weight of this mass, which is considerable. It will be apparent that if, as proposed, the inner ends of the walls 4 of the channels are entirely cut away, which would afford maximum clearance for the severed beet strips, there is produced in this section of the knife an area of maximum weakness in which the blade will tend to flex under the weight of the beets imposed upon the forward unsupported end of the knife, and that this flexure will unavoidably destroy the adjusted relation of the gauge bar 7 to the cutting edge of the knife.

I have discovered that by milling or otherwise decreasing the transverse thickness of the inner ends of the walls 4 of the channels, rearwardly of the line A—A for example, the efficiency of the knife in forming the elongated strips of beet is materially increased and without affecting the normal rigidity of the knife. The increased width of the channels effected in this manner permits the strips to fall away freely from the channels and substantially precludes possibility of the strips jamming or binding in the channels. The walls 4 of the channels in this area of reduced thickness remain, however, to function as reinforcing ribs, preventing flexure of the blade as previously described, so that the relation between the cutting edge of the knife and the gauge bar 7 remains constant. I have found it practicable, in order to afford a further degree of clearance for the strips in leaving the channels, to reduce the height of the walls 4 from their upper edges in that section of the knife rearwardly of the line A—A in which the transverse thickness of the walls has been reduced in accordance with my invention, although such reduction in the height of the walls should be limited to an extent not affecting the substantial rigidity of the knife required for efficient operation as described above; and the attached drawings illustrate a knife incorporating this feature.

It will be noted that in decreasing the width and the height of the walls 4 of the channels in accordance with my invention, I do not in other respects alter the characteristics of the knife as a whole. The useful life of the blade is not affected for example, since the narrowing of the walls 4 is confined substantially to that portion of the knife rearwardly of the line A—A which marks the inner practical limit of the cutting edge. Also as previously set forth, the narrowing of the channel walls does not adversely affect the strength and normal rigidity of the blade. A knife made in accord-

ance with my invention is substantially free from tendency to clog, and has shown in practice a materially increased efficiency over the knives of the prior art.

I claim:

1. A beet knife comprising a substantially flat blade having in a face thereof a series of longitudinal channels the walls of which at their front ends terminate in the cutting edge of the knife, the bottom walls of said channels at their rear ends curving outwardly toward the said face of the blade, and the upper edges of the side walls of said channels at their rear ends extending inwardly toward said curved bottom walls to provide a transverse channel intersecting the longitudinal channels first named, and the said side walls being of reduced thickness at their rear ends to thereby increase the width of the longitudinal channels in that portion thereof adjoining said transverse channel.

2. A beet knife comprising a substantially flat blade having adjoining channels in a face thereof, the walls of said channels terminating at their outer end in a cutting edge, and the bottoms of the channels curving upwardly at their inner ends to intersect the said face of the blade, the walls of the channels above the said bottom surface and toward their inner ends being reduced in thickness to afford an increased channel width within the area of said reduction.

3. A beet knife comprising a substantially flat blade having adjoining V-bottomed channels in a face thereof, the walls of said channels terminating at their outer end in a cutting edge, and the said bottoms of the channels curving upwardly at the inner ends to intersect the said face of the blade, the walls of the channels toward their inner ends and above said V-bottoms being reduced in thickness to afford an increased channel width within the area of said reduction.

4. A beet knife comprising a substantially flat blade having adjoining channels in a face thereof, the walls of said channels terminating at their outer end in a cutting edge, and the bottom surfaces of the channels curving upwardly at the inner ends to intersect the said face of the blade, the walls of the channels above said bottom surfaces and from a point intermediate the ends thereof toward the inner ends of the channels being reduced from the upper edges both in height and in thickness.

5. A beet knife comprising a substantially flat blade having adjoining channels in a face thereof, the walls of said channels terminating at their outer end in a cutting edge, and the bottom surfaces of the channels curving upwardly at the inner ends to intersect the said face of the blade, the walls of said channels above said bottom surfaces terminating short of the point where the said bottom surfaces intersect the said face of the blade, and the inner ends of the side walls of the channels above the said bottom surfaces being of reduced thickness to afford an increased channel width within the area of said reduction.

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