

Dec. 17, 1935.

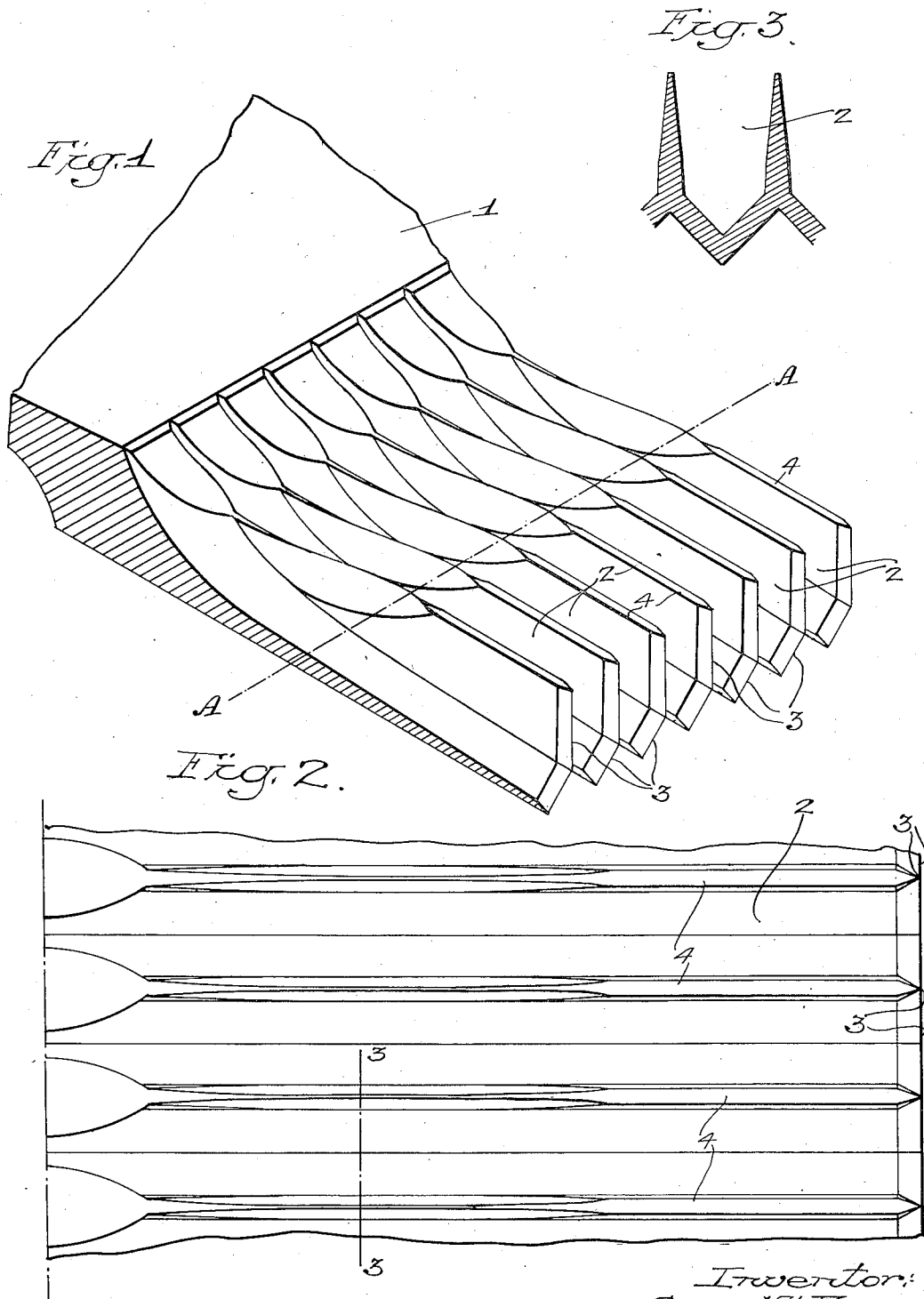
S. T. FREAS

2,024,918

BEET KNIFE

Filed March 6, 1934

2 Sheets-Sheet 1



Inventor:  
Samuel T. Freas  
By his Attorneys,  
Horsman & Horsman

Dec. 17, 1935.

S. T. FREAS

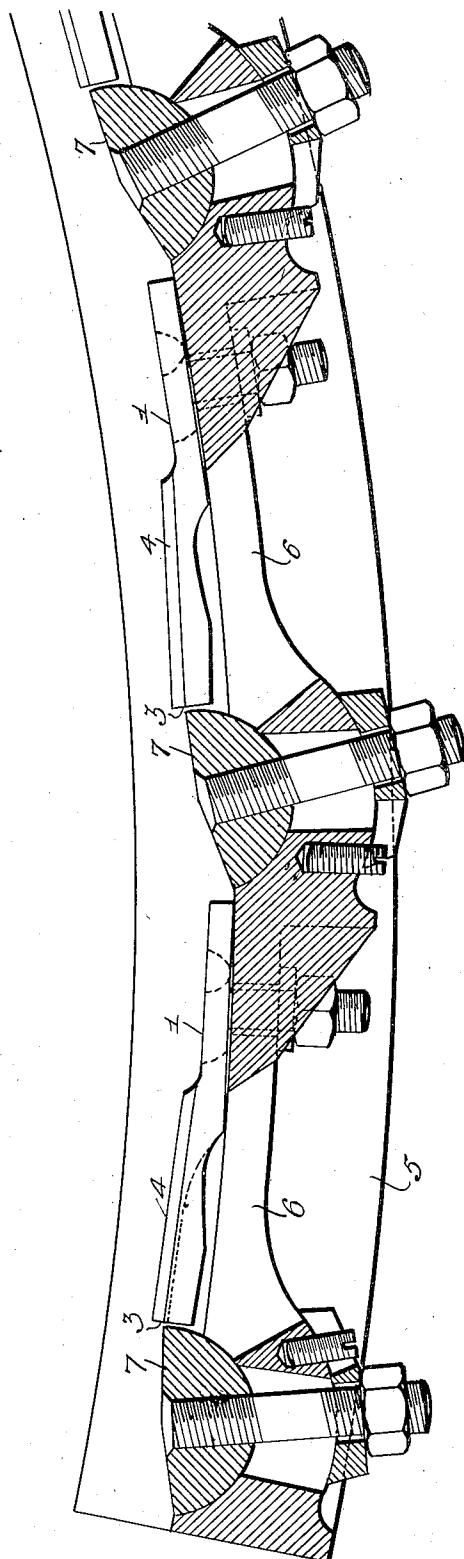
2,024,918

BEET KNIFE

Filed March 6, 1934

2 Sheets-Sheet 2

Fig. 4.



Inventor:  
Samuel T. Freas  
by his Attorneys.  
Horton & Horton

## UNITED STATES PATENT OFFICE

2,024,918

## BEET KNIFE

Samuel T. Freas, Trenton, N. J., assignor to Henry  
Disston & Sons, Incorporated, Philadelphia,  
Pa., a corporation of Pennsylvania

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 in-  
vention 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 perspec-  
tive 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 plu-  
rality 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 dis-  
charged 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 inter-  
feres 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 re-  
quired, for substantially effective results, the  
strength of the knife is impaired to a degree  
rendering the blade flexible under the condi-  
tions 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 cylin-  
drical drum, one section of which is shown at  
5. The forward ends of the knives overlie open-  
ings 6 in the drum, and gauge bars 7 are ad-  
justably 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 clear-  
ance for the severed beet strips, there is pro-  
duced 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 im-  
posed 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 other-  
wise decreasing the transverse thickness of the  
inner ends of the walls 4 of the channels, rear-  
wardly of the line A—A for example, the effi-  
ciency of the knife in forming the elongated strips  
of beet is materially increased and without af-  
fecting the normal rigidity of the knife. The in-  
creased width of the channels effected in this man-  
ner 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 re-  
duced thickness remain, however, to function  
as reinforcing ribs, preventing flexure of the  
blade as previously described, so that the rela-  
tion 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 de-  
gree 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 re-  
duced in accordance with my invention, al-  
though 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 incorporat-  
ing 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.

5 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.

SAMUEL T. FREAS.