

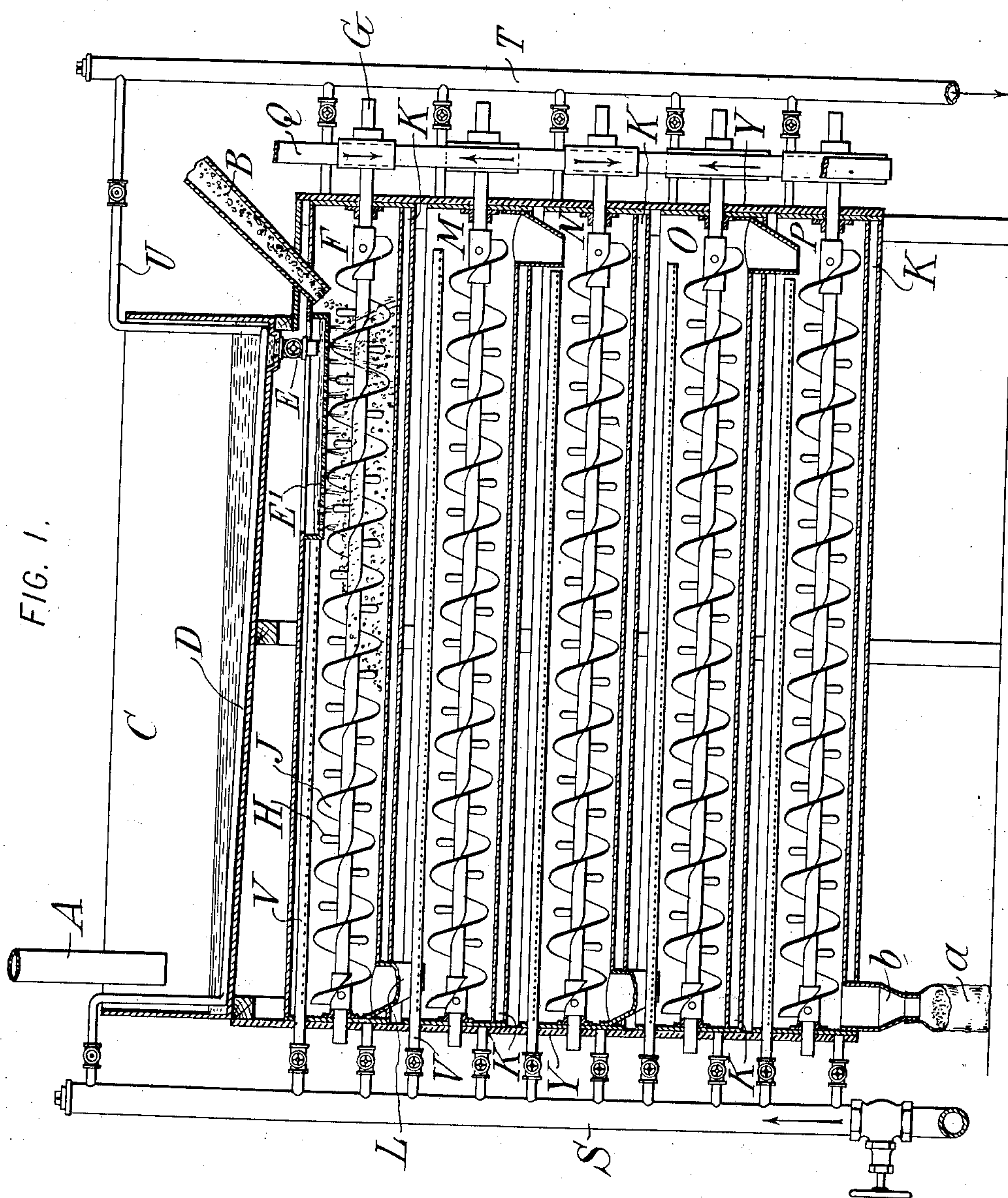
No. 854,159.

PATENTED MAY 21, 1907.

S. L. FRASER.  
APPARATUS FOR MAKING MOLASSES FEED.

APPLICATION FILED DEC. 8, 1903.

2 SHEETS—SHEET 1.



WITNESSES:  
*Ired White*  
*Kene' Bruine*

INVENTOR:  
*Spencer L. Fraser,*  
By Attorneys,  
*Arthur C. Fraser & Co*

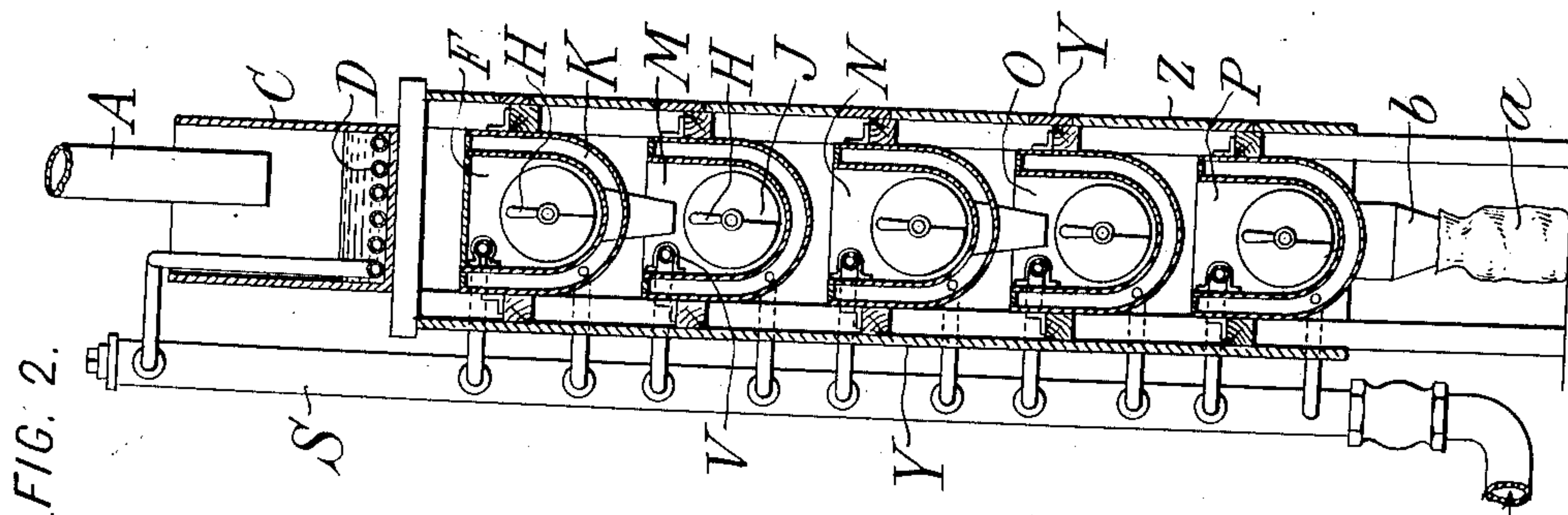
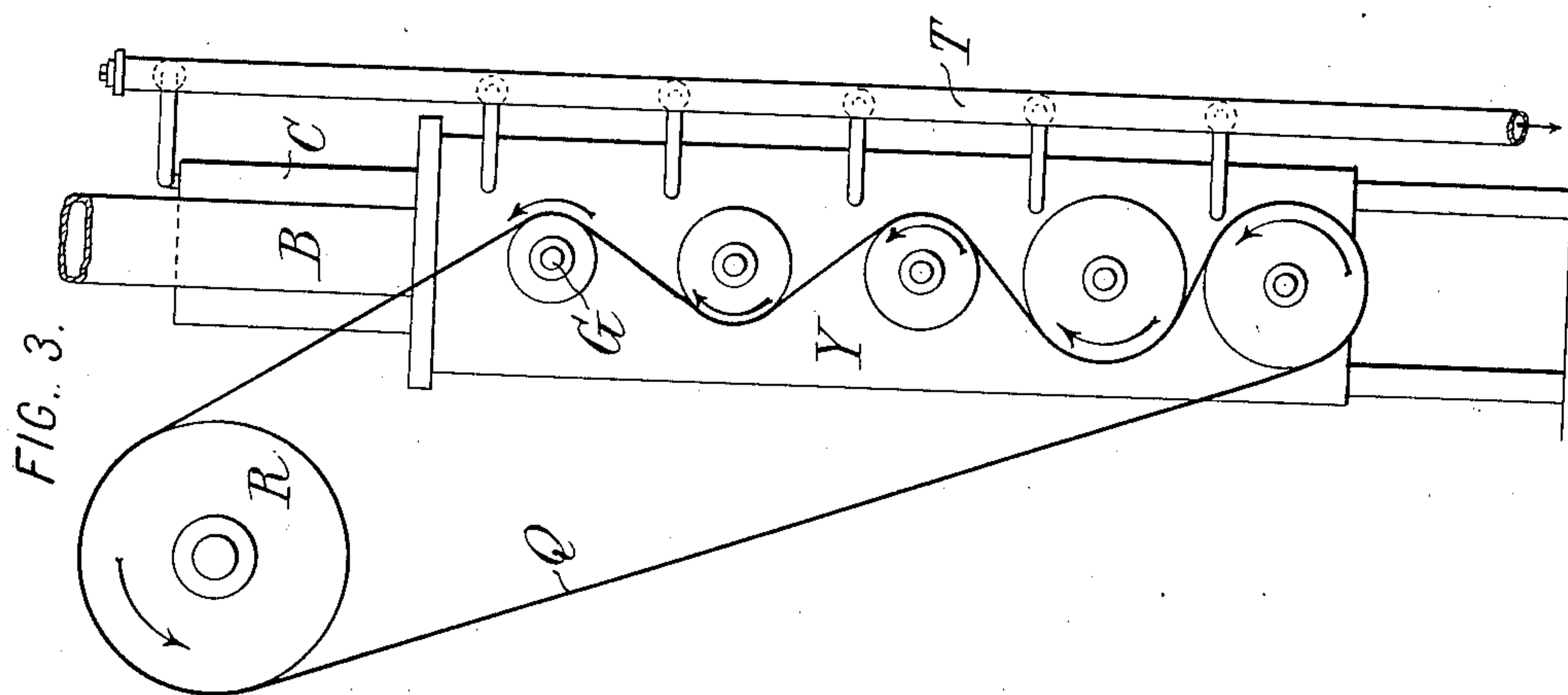
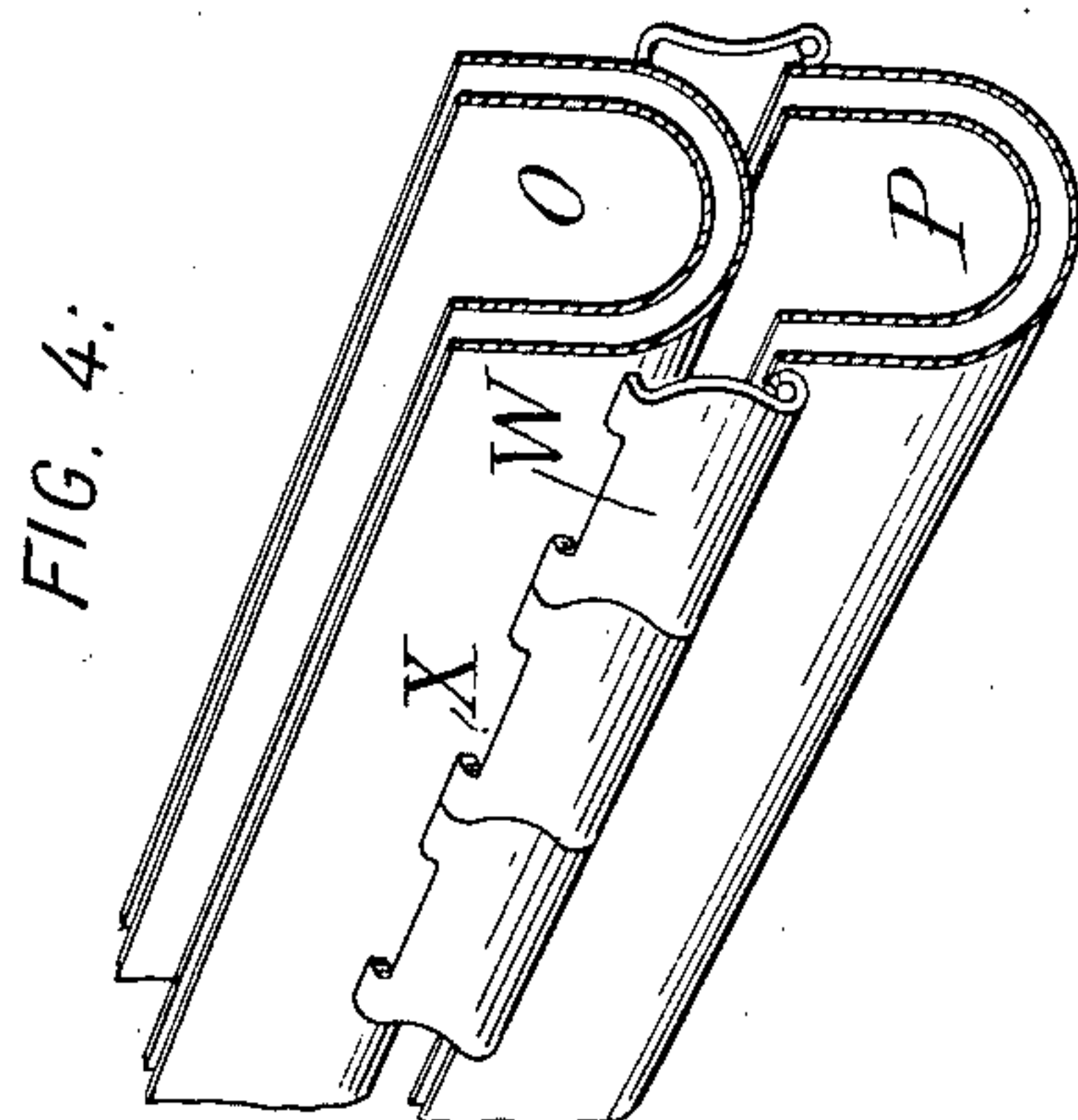
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# UNITED STATES PATENT OFFICE.

SPENCER L. FRASER, OF CHICAGO, ILLINOIS.

## APPARATUS FOR MAKING MOLASSES FEED.

No. 854,159.

Specification of Letters Patent.

Patented May 21, 1907.

Application filed December 8, 1903. Serial No. 184,364.

*To all whom it may concern:*

Be it known that I, SPENCER L. FRASER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Apparatus for Making Molasses Feed, of which the following is a specification.

In a prior patent, No. 704,530, granted to me July 15, 1902, I have described a stock feed consisting of a mixture of a finely divided fibrous or absorbent base material with molasses, and a process of making the same.

My present invention provides an apparatus for making feed of this general type. In my prior patent above-referred to the complete process required several days' time. By my present apparatus I am enabled to make the feed complete and ready for final grinding (where it is to be ground) in a very short time. My present machine also finishes the preparation of the feed in one continuous process and handles the material automatically throughout. It therefore enables me to produce the feed more cheaply and of a more uniform quality than by the apparatus previously used.

My improved apparatus includes means for heating the molasses and for feeding the heated molasses together with the base material into a mixing vessel. Means are provided also for heating this vessel so as to maintain the fluidity of the molasses and for stirring the material at the same time and gradually conveying it to the end of the mixing vessel. At the end of the mixing vessel the thoroughly mixed material is received into another vessel which in construction may be the same as the mixing vessel and which may in fact be a continuation of the same, but which serves the purpose of gradually drying the material until it ceases to be sticky, the molasses being gradually absorbed into the base and the water evaporated. An important step in this last drying or "curing" operation is the continual stirring of the product to prevent its forming lumps which, not drying on the inside, become sour and spoil the feed so that cattle refuse to eat it. For this reason the drier is also provided with a stirring device which breaks up the lumps as fast as they form. Means are also provided for conveying the material as it is dried gradually to the end of the apparatus

where it may be discharged into bags; or where it is to be further ground it may be discharged into a chute leading to a grinding mill of any suitable type. Various other improvements in detail are specified hereinafter.

The accompanying drawings illustrate an apparatus embodying the invention.

Figure 1 is a longitudinal section of the apparatus. Fig. 2 is a transverse section. Fig. 3 is an end view. Fig. 4 is a perspective view illustrating a detail.

Referring to the drawings, A is the molasses inlet and B the feed inlet. The molasses enters first a tank C within which is a coil D for the circulation of steam, hot water or other heating medium. The bottom of the tank C is inclined, and at its lower end is a discharge spout E. The molasses from the spout E enters a box E' having a perforated bottom, or by any other suitable means is showered or sprayed on to the stirring base material and thus thoroughly and evenly mixed therewith. The base material and the molasses entering in small streams are quite well mixed and only a slight further stirring is necessary. For this purpose a shaft G extends lengthwise of the trough F carrying mixing blades H and combined mixing and conveying blades J extending the entire length of the trough. In order that the molasses shall be kept quite fluid so as to facilitate its thorough admixture with the base material the trough F is provided with a jacket K for steam, hot water or the like. At the rear end of the trough F there is provided a chute L through which the thoroughly mixed material falls.

Arranged in a series below the trough F are a number of similar troughs M N O P. These may be arranged in various ways not necessary to describe in detail, but are preferably arranged one above the other, as shown, for the sake of compactness and in order to secure a variation in the speed of the shafts as referred to hereinafter. The shafts in the several troughs M N O and P are provided with stirring blades H and combined stirring and conveying blades J similar to those in the mixing trough F. The successive troughs discharge at alternate ends as shown into the next lower trough, and the alternate direction of rotation of the shafts for effecting the alternate direction of con-



veyance of the material is produced by driving the shafts in alternate directions, as indicated, by the belt Q, Fig. 3, driven from any suitable source such as a driving pulley R. The speed of rotation of the shaft G of the uppermost or mixing trough is more rapid than that of the other shafts, since the latter serve chiefly for the breaking up of lumps and the gradual drying and conveying of the material while the shaft G serves for thoroughly mixing the ingredients so that each particle of the base material shall receive a portion of the molasses as far as possible. I may also drive the shafts of the lowest two troughs O and P at a lower rate than those of the intermediate troughs M and N so that at the end the material shall be retained longer in the trough and more thoroughly dried. It is understood that the troughs M N O and P are provided with jackets K for steam or other heating medium for effecting the drying.

Any suitable arrangement of steam or hot water pipes may be used. As illustrated a main steam pipe S extends up along one end of the complete apparatus and is provided with branches to the coil D and the several jackets, which coil and jackets discharge at the opposite ends of the troughs into a common discharge pipe T, suitable valves being provided for limiting or cutting off the steam or hot water. The discharge pipe U from the coil D and those from the jackets are shown of the style suitable for hot water. For steam they should run continuously downward from the coil or jacket to the common discharge pipe T so as to avoid the formation of a trap for the water of condensation.

The nature of the material is such that it is apt to stick on the mixing blades. In order to clean the blades I provide in the upper part of each trough a longitudinally extending perforated pipe V, the perforations being directed toward the mixing blades. These pipes are connected to the main supply pipe S. Upon the completion of a batch of feed steam may be admitted to these jet pipes, which by its force and by its heat will wash off the blades and wash the remaining material down through the apparatus.

A device for preventing the splashing of the feed out of the trough is indicated in Fig. 4, and though not essential is of considerable value. It also serves to confine the heat to some extent. It consists of an apron or door W hinged at one edge and adapted to be swung upward to close the space between two adjacent troughs or to be swung downward to permit inspection of the troughs. Its free edge is cut out at intervals as indicated at X for allowing the escape of the moisture arising from the feed in the troughs.

Preferably the entire apparatus is inclosed in a casing or box Y of asbestos or similar

nonconducting material to prevent the waste of heat. The casing may be provided with doors Z at one side permitting access to the several troughs. The apparatus may stand a slight distance above the floor on legs or other suitable supports as indicated, leaving space for bags a to be placed under the discharge chute b of the lowest trough.

The apparatus might be used without the initial heating tank C, the molasses being previously of a suitable degree of liquidity, or where a small quantity of feed is to be made the heat in the mixing trough F might be depended upon to render the molasses sufficiently fluid as well as to maintain it so.

Though I have described with great particularity of detail a complete apparatus embodying my invention, yet it is to be understood that the invention is not limited to the specific apparatus disclosed.

Various modifications in detail and in the arrangement and combination of the parts may be made by those skilled in the art without departure from the invention.

What I claim is:—

1. An apparatus for making molasses feed, including in combination a tank C, a heating coil therein, a trough F, a shaft therein carrying conveying and mixing blades, a heating jacket for said trough, means for feeding molasses into said tank C, means for feeding fresh base material and the molasses from said tank simultaneously into said trough F, a series of troughs M N O and P, shafts therein carrying stirring and conveying blades, heating jackets for said troughs M N O and P, and means for feeding the mixed material from said trough F through said troughs M N O and P in succession.

2. An apparatus for making molasses feed, including in combination a tank C, a heating coil therein, a trough F, a shaft therein carrying conveying and mixing blades, a heating jacket for said trough, means for feeding molasses into said tank C, means for feeding fresh base material and the molasses from said tank simultaneously into said trough F, a series of troughs M N O and P, shafts therein carrying stirring and conveying blades, heating jackets for said troughs M N O and P, and means for rotating the shaft of said trough F more rapidly than the shafts of said troughs M N O and P.

3. An apparatus for making molasses feed, including in combination a plurality of troughs one above another, stirring blades carried therein, and movable aprons arranged to close the space between two successive troughs.

4. An apparatus for making molasses feed including in combination a tank C, a heating coil therein, a trough F, a shaft therein carrying conveying and mixing blades, a heating jacket for said trough, means for feeding molasses into said tank C, a perforated box E



between said tank C and said trough F, means for feeding molasses from said tank C to said box E' and thence through said perforations in a spray or shower into said trough F, and means for simultaneously feeding fresh base material into said trough.

5 5. An apparatus for making molasses feed including in combination a mixer for mixing the molasses with a base, a plurality of driers, means for feeding the material through said mixer and into and through each of said driers in succession, means for heating said driers, and means for separately controlling the temperatures therein.

15 6. An apparatus for making molasses feed including in combination a mixer for mixing the molasses with a base, a drier for bringing the mass to a nonsticky condition and preventing the formation of lumps, means for feeding the material through said mixer and

drier in succession, means for heating said mixer and drier, and means for separately controlling the temperatures therein.

7. An apparatus for making molasses feed including in combination a heating tank for increasing the fluidity of the molasses, a mixer for maintaining the fluidity thereof and mixing it with a base, means for feeding the material from said tank to said mixer, means for heating the material in said tank and said mixer, and means for separately controlling the temperatures therein.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

SPENCER L. FRASER.

Witnesses:

J. HANS PEN,  
SAMUEL W. POLKEY.