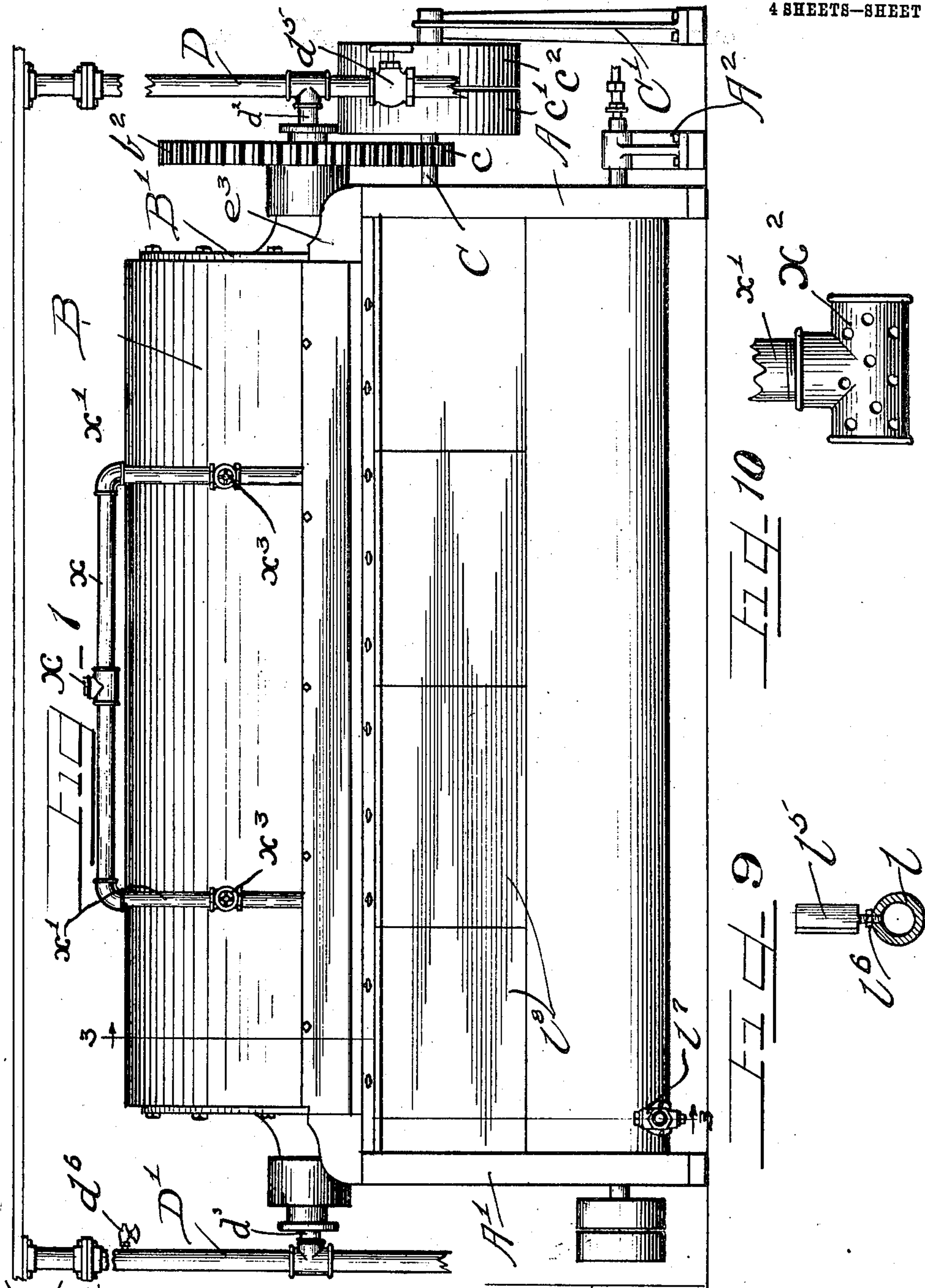


W. B. ALLBRIGHT.
COOLING APPARATUS.
APPLICATION FILED DEC. 12, 1908.

960,614.

Patented June 7, 1910.

4 SHEETS—SHEET 1.



WITNESSES

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960,614.

4 SHEETS—SHEET 2.



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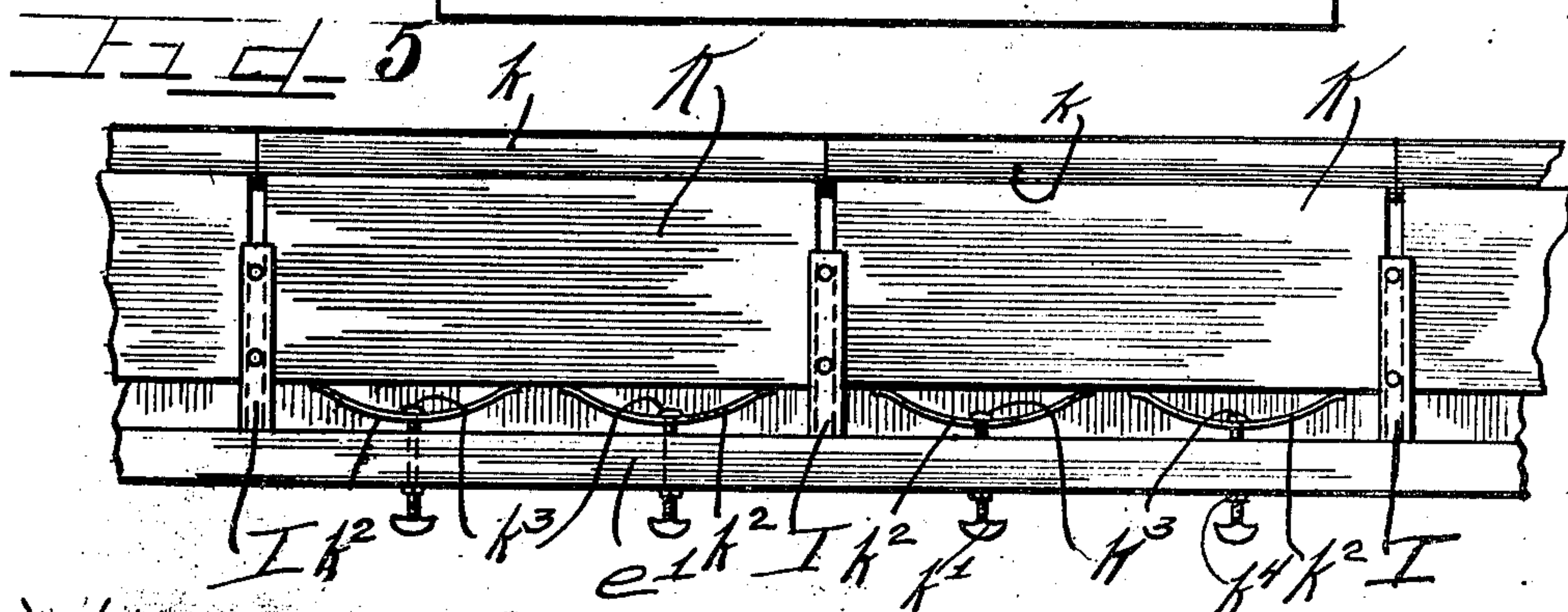
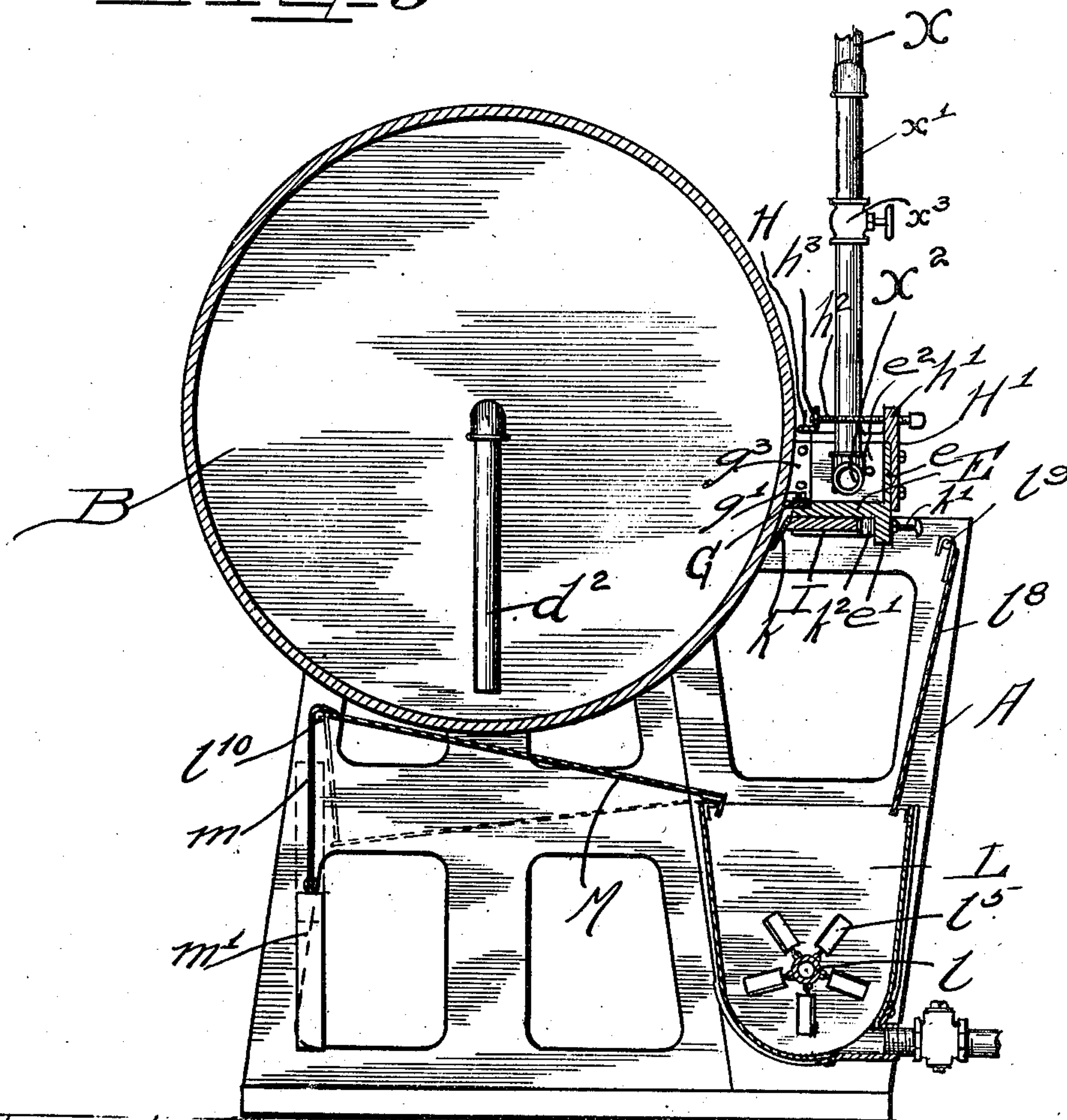
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4 SHEETS—SHEET 3.

Fig 3



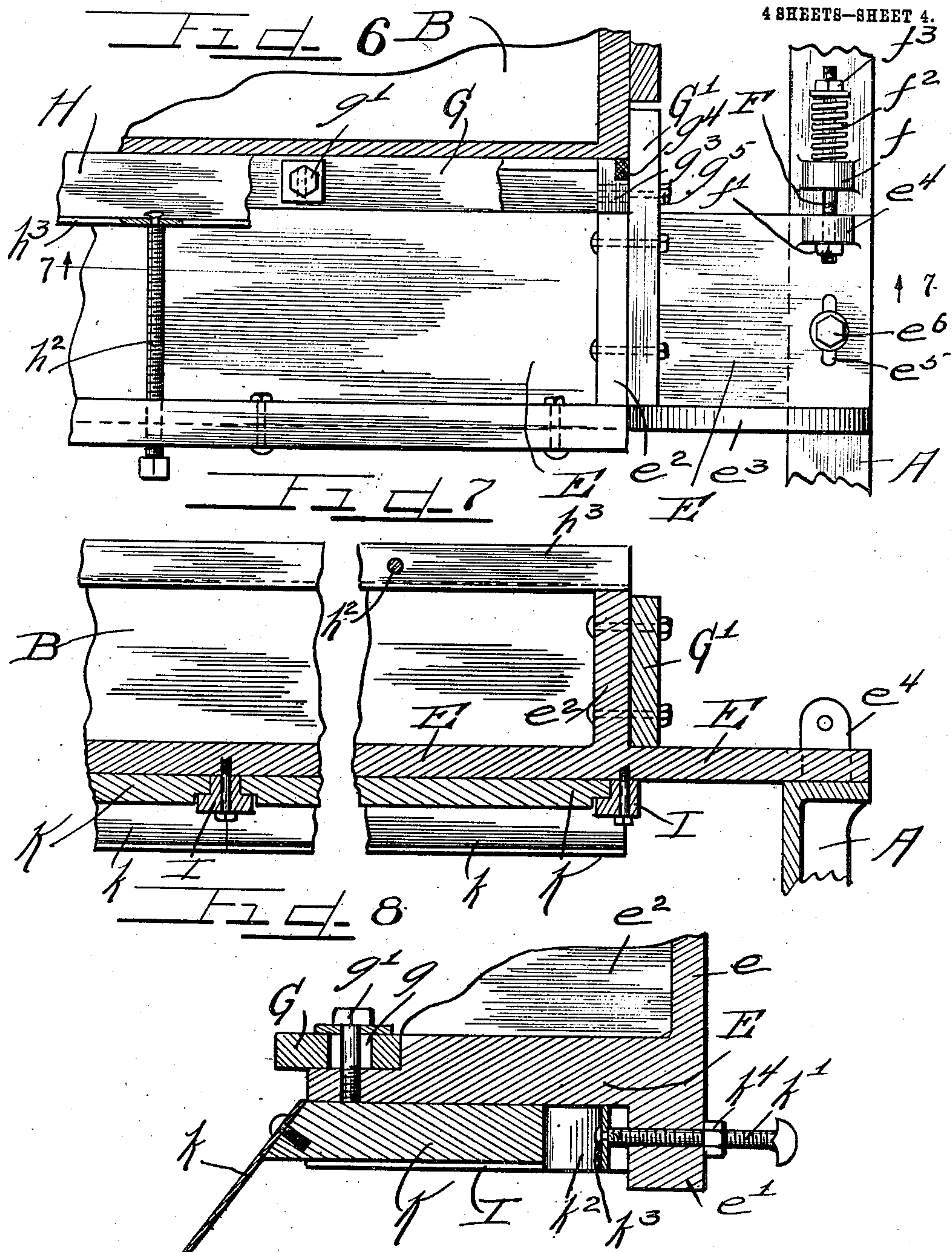
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4 SHEETS—SHEET 4.



WIPESSE!

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UNITED STATES PATENT OFFICE.

WILLIAM B. ALLBRIGHT, OF CHICAGO, ILLINOIS.

COOLING APPARATUS.

960,614.

Specification of Letters Patent.

Patented June 7, 1910.

Application filed December 12, 1908. Serial No. 467,251.

To all whom it may concern:

Be it known that I, WILLIAM B. ALLBRIGHT, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Cooling Apparatus; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates more particularly to that class of cooling or temperature changing apparatus set forth in the United States Letters Patent issued to me on the 19th day of September, 1905, No. 799,823, for "cooling apparatus," and in which a rotatable cylinder was employed for the purpose of rapidly cooling the material to be treated.

With cooling devices such as described it was soon found that in operation it sometimes occurred that some of the lard or other material (if insufficiently cooled or if coated too thickly on the cylinder) might drop therefrom before reaching the laterally disposed scraping knives, thus dropping from the cylinder (from the lower side thereof) and being thereby lost or contaminated by falling upon the floor. Also, a serious objection to the use of such cylinders sometimes is found in the fact that, owing to the very low temperature of the surface occasioned by the cold brine within the same, rapid condensation upon the surface occurred when the cylinder was not in operation, in consequence a considerable amount of water usually collected on the cylinder and from thence might, in some cases, run down into the lard receptacle below the same, necessitating considerable attention before it was possible to again operate the machine.

A further serious problem presented itself owing to the difficulty experienced in preventing the brine or other liquid or agent inserted into the cylinder from flowing or siphoning out of the same while in operation, thus materially decreasing the efficiency of the plant because of the cylinder not being entirely filled with the cooling agent. The difficulty experienced in this particular will be readily understood from the fact that when the plant is shut down for the day it is important to drain the cylinder to

limit so far as possible the condensation that would otherwise occur upon its surface.

The object of this invention is to provide in a cooling apparatus of the class described a rotatable, hollow drum or cylinder having connected therein circulating pipes for any agent suitable to affect the temperature thereof and to provide in connection with said cylinder a laterally disposed trough for delivering the material to be treated and to afford in connection therewith spring pressed knives for scraping the cooled lard or other material from the surface.

It is also an important object of the invention to provide in connection with a machine of the class described a receptacle to receive the lard or other material scraped from the cylinder and to provide within said receptacle a picker shaft having radial blades adapted to be adjusted to vary the operation upon the material received in the receptacle as well as its delivery therefrom.

It is also an object of the invention to afford in a machine of the class described a laterally disposed receptacle adapted to receive the material from the scraping knives and positioned with its top below the cylinder, and to afford in connection therewith an inclined table adapted for adjustment to direct any of the material to be treated that might fall from the cylinder into said receptacle or to direct the water of condensation dripping from the cylinder from the receptacle.

It is also an important object of the invention to afford simple connections for reversing the flow of the cooling agent to drain the cylinder.

It is also of great importance to afford in a construction of the class described a containing trough for the lard or other material to be treated which is at all times so supported that the side of the cylinder affords one side of the trough and also to so support the trough with reference to the cylinder as to insure at all times such yielding though positive pressure at the bottom and ends of the trough on said cylinder as to afford a tight joint to prevent leakage from the hot lard or other material.

Finally, it is an object of the invention to perfect and improve the device in all particulars possible and at the same time not only to economize in the construction and to generally simplify the device, but as well

to afford a construction of the greatest simplicity, durability and highest possible efficiency for the purpose described.

The invention embraces numerous novel features and consists in the matters herein-
5 after described and more fully pointed out and defined in the appended claims.

In the drawings: Figure 1 is a side elevation of a device embodying my invention.
10 Fig. 2 is a fragmentary rear elevation of the same showing the cylinder partly in section. Fig. 3 is a section taken on line 3—3 of Fig. 1. Fig. 4 is a fragmentary top plan view of the picker receptacle, showing the
15 picker shaft with the adjustable blades thereon. Fig. 5 is an enlarged, fragmentary bottom plan view of the receiving trough for the material to be treated. Fig. 6 is an enlarged fragmentary top plan view partly
20 broken away of the receiving trough showing the cylinder in section. Fig. 7 is a fragmentary section taken on line 7—7 of Fig. 6. Fig. 8 is an enlarged fragmentary transverse section of the receiving trough show-
25 ing one of the scraping knives with the carrier therefor also in section. Fig. 9 is an enlarged sectional detail of the picker shaft illustrating the method of securing the picker blades adjustably thereon. Fig. 10
30 is an enlarged, fragmentary detail of the discharge pipe whereby the material to be treated is delivered to the cylinder.

As shown in the drawings: A—A', are upright standards or end frame members,
35 each of which is provided at its upper end with a journal box *a*, in which is revolubly journaled the hollow cylinder or drum B, by means of tubular gudgeons *b—b'*, integral with the heads B', which are bolted
40 to the ends of the cylinder. Said cylinder is constructed of cast iron or any suitable material affording a good conductor for heat and preferably affords thin walls of practically uniform thickness.

45 Keyed on the gudgeon *b*, is a gear wheel *b*², which meshes with a pinion *c*, secured on a shaft C, suitably journaled to drive the cylinder, and on which is provided a tight and loose belt pulley *c'—c*², in a familiar
50 manner. As shown, the outer end of the shaft C, is journaled upon a standard C', to afford a bearing therefor.

Extending through the hollow gudgeon *b*, and a suitable gland *d'*, engaged thereto is
55 an inlet tube *d*, which, at its outer end connects with an inlet main D, communicating with a source of supply for the refrigerant which may be either an elevated tank or any suitable means for forcing the refrigerant
60 into the cylinder. Within the cylinder the inner end of the pipe *d*, is directed downwardly to near the inner periphery of the cylinder. For this purpose a pipe section *d*², is connected with said inner end of the pipe
65 *d*, in any suitable manner to deliver the in-

flowing brine to the bottom of the cylinder. At the opposite end of the cylinder and extending through the gudgeon *b'*, is the outlet pipe *d*³, which extends through a suitable gland *d*⁴, engaged in the bore of said
70 gudgeon, as shown in Fig. 2. Said pipe *d*³, at its inner end extends to near the top of the cylinder to enable the brine to flow outwardly only when the cylinder is full. At its outer end said pipe is connected with the
75 outflowing main pipe D', which may return the refrigerant to a cooling tank or other receptacle or compressor for further use.

As shown, the inlet main D, is provided with an inlet valve *d*⁵, as shown in Fig. 1,
80 to regulate the flow into the cylinder, and as shown also, the outlet main D', is provided above the top of the cylinder with a vent valve *d*⁶. By shutting off the pressure from the inlet pipe D, opening the valve *d*⁵,
85 and opening the vent valve *d*⁶, in the outlet pipe, which is located above the cylinder, the entire contents of the cylinder may be quickly siphoned out, thus emptying the cylinder when it is desired to shut down. In
90 normal operation, however, this siphoning action can never occur inasmuch as the normal outlet is from the top of the cylinder while the normal inlet is at the bottom thereof.
95

Slidably supported upon the end frame members A—A', which project laterally beyond the cylinder is the receiving trough for the lard or other material to be treated. The
100 trough, as shown, comprises an integral bottom plate E, an outer side plate *e*, extending upwardly therefrom, and integral therewith, and a downwardly directed web *e'*, in alinement with the outer side wall *e*, and
105 extending below the bottom of the trough and integral end walls *e*². Said bottom E, is of a length to rest on its ends on both said standards or end frame members A—A', and the end walls *e*², are so positioned as to
110 coincide approximately with the ends of the cylinder respectively. As shown, said trough bottom E, is flanged as indicated by the reference letter *e*³, from each end member *e*², to the extremity of said bottom member to afford strength, and each of said bottom mem-
115 bers is provided with an upwardly extending lug *e*⁴, which faces toward the axis of the cylinder, and is oppositely disposed from a correspondingly apertured lug *f*, integral with the respective end frame members, and
120 as shown, a tension bolt F, extends through both said lugs and is provided on the outer side of the lug *e*⁴, with a nut *f'*, and on its opposite extremity is provided with a strong spiral spring *f*², and nut and washer *f*³, to
125 enable the tension of the spring to be adjusted whereby the trough is at all times drawn firmly against the cylinder. As shown also, a transverse slot *e*⁵, is provided in each end of said bottom members E, in
130

position to receive a stud bolt e^6 , there-through and which, by engaging in the end frame member, is adapted to hold the trough in adjustment.

5 Packing means are provided for the bot-
tom and ends of the trough to prevent leak-
age of the material to be treated therefrom.
For this purpose the bottom E, of the trough
is rabbeted between the end walls e^2 , and fit-
10 ted therein and of slightly greater width
than the rabbet is a strip of packing ma-
terial G, preferably of somewhat softer ma-
terial than the cylinder. For this purpose
wood, fiber or some suitable metal may
15 be employed. As shown, said packing strip
is provided with transversely slotted aper-
tures g , therethrough through which extend
cap screws g' , which engage in the rabbeted
bottom of the trough, as shown in Figs. 6
20 and 8. Said cap screws when released per-
mit the packing strip G, to be forced out-
wardly and into positive bearing against the
cylinder and when set up retain the packing
strip in adjusted position to prevent leak-
25 age. In a corresponding manner the end
walls e^2 , are packed. For this purpose, as
shown, a plate G' , of any suitable material
such as wood or fiber or a suitable metal
is bolted upon the end walls e^2 , on the outer
30 side thereof to bear firmly against the end
or head of the cylinder which acts as a
guide for the trough, and bolted thereto and
filling in the sides between the end walls e^2 ,
and the periphery of the cylinder is a pack-
35 ing block g^3 , which of itself may serve the
purpose or if preferred, an additional pack-
ing material g^4 , may be employed in the
angle included between the packing blocks
 g^3 , and the end plate or block G' , as shown
40 in Fig. 6. Of course, the mutual wear of
the packing strips on the periphery of the
cylinder tends to insure the perfect fit there-
to. The end packing block g^3 , however, as
well as the bottom packing strip G, is ad-
45 justable outwardly, should it be necessary,
by first loosening the bolt g^5 , and setting
said block as desired, the aperture for said
bolt in said block preferably being slotted
to permit this to be done.

50 Means are provided for insuring the even
distribution of the material or lard upon the
cylinder in a layer of uniform thickness, and
for this purpose, a straight edge blade or
bar H, is employed, which is supported on
55 the top of the trough and is adjustable to-
ward or from the cylinder to vary the thick-
ness of the material the cylinder is permitted
to carry. For this purpose, a plate H' , is
fitted on the outer wall e , of the trough and
60 extends above the same and near its top, as
shown, is flanged over the top of the trough
and is likewise bolted through the top there-
of, as shown in Fig. 6, to afford a rigid
support thereover, and threaded through the
65 upper edge h' , of said plate are adjusting

bolts h^2 , each at its inner end rotatably en-
gaged in the upwardly directed flange h^3 ,
of an angle bar, the web of which is thereby
held in adjusted relation with the periphery
of the cylinder, said angle bar as a whole 70
being indicated by H, and for convenience
called a "doctor". Said adjusting bolts are
provided on the outer ends with heads
adapted to be engaged by a wrench or in
any suitable manner to adjust the doctor 75
toward or from the cylinder to vary the
thickness of the material to be carried
thereby.

Secured on the bottom E, of the trough
by means of cap screws or otherwise, are T 80
bars I, spaced equal distances apart and af-
fording between the flanges thereof and said
bottom, guideways for the knife carriers K.
Said knife carriers, as shown, are construct-
ed of cast metal and on their edge adjacent 85
the cylinder are beveled downwardly and
inwardly at an angle such that when the
scraping knives k , are bolted thereto, as
shown in Figs. 3 and 8, the lower edge of
the knives are thus directed against the pe- 90
riphery of the cylinder nearly at a tangent
therewith or at least at such an angle there-
with as to cut the film of lard or other ma-
terial therefrom with the least possible re-
sistance to the rotation of the cylinder. 95
Said carriers conveniently, are of equal
length and the knives k , carried thereon are
sufficiently greater in length for each of said
knives to abut against the adjacent knife, as
shown in Fig. 5, and as shown, adjusting 100
screws k' , are threaded through the down-
wardly directed flange e' , of the trough, and
at their inner ends are rotatably engaged
with leaf springs k^2 , by means of screws k^3 ,
which extend through the leaf springs and 105
axially into the adjusting screws or bolts.
As shown, each of the carriers is provided
with two of such leaf springs, one near each
end thereof, each provided with its adjust-
ing bolt, and as shown, jam nuts k^4 , are pro- 110
vided on the adjusting bolts to hold the
same in adjusting position to insure the
proper spring tension of the knife against
the periphery of the cylinder.

The receptacle L, for the lard removed 115
from the cylinder, is directly beneath the
trough and the top thereof is below the bot-
tom of the cylinder. The bottom of said
receptacle is cylindrically concaved and
journaled therein is the tubular picker shaft 120
 l , which extends through the ends of said
receptacle and through suitable stuffing
boxes and is journaled in the standard A^2 ,
and in the standard A' , and is provided at
one end with an inlet pipe l' , which extends 125
through a suitable gland l^2 , and through
which steam or a refrigerating fluid may be
admitted into the picker shaft to affect the
contents of said receptacle. On its opposite
end the picker shaft is provided with tight 130

and loose pulleys l^3 — l^4 , in a familiar manner.

Within the receptacle are radially and spirally arranged picker blades l^5 . These, as shown, are threaded into suitable apertures in the tubular shaft, and each is provided with an exterior jam nut l^6 , to permit the said picker blades to be adjusted in any desired angular relation with the shaft to vary the mixing and feeding action of the lard or other material therein, including, of course, if desired, its final delivery through the outlet pipe l^7 .

To protect the contents of the picker receptacle from contamination by dust or otherwise, extension side walls l^8 , for the receptacle are provided, which extend at the lower end into the receptacle and at the upper end are provided with hooks which engage over the side rods l^9 , connecting the end frame members, as shown in Fig. 3. A stay rod or support l^{10} , extending between the standards A—A', on the opposite side of the axis of the cylinder from said picker receptacle, is provided and at a point higher than the top of said receptacle, and extending from the inner wall of said receptacle, beneath the cylinder and to near said stay rod is the table M. This, as shown, is flanged at its inner edge to hook over the upper edge of said receptacle and at its outer edge is engaged by chains, cables or other suitable flexible connections m , on each of which is supported a weight m' , sufficient to support said table in elevated position, as shown in Fig. 3, but which permit the rear edge of said table to be pulled downwardly to incline the table, as shown in dotted lines in Fig. 3, to direct the water of condensation from the picker receptacle when the machine is not in use or following the first starting of the machine.

The lard, composition or other material to be treated is delivered to the cylinder through the pipe X, which connects in a header x , from which valved pipes x' , extend to near the bottom of the trough and at the lower ends are each connected in a tee X^2 , the open ends of which are directed longitudinally of the trough and are located conveniently between the middle and the ends of the trough. This prevents splashing when the liquid material is delivered into the machine. As shown, each tee is perforated on the side adjacent the cylinder to spray or deliver laterally against the same inasmuch as the longitudinal flow from the ends of the tees might otherwise prevent an adequate amount of the material being deposited on the cylinder opposite the tees. Of course, the tees may be connected with horizontal perforated pipes to spray onto the cylinder in which event the trough may not be required except to catch any excess of the material. Inasmuch as the valve X^3 ,

controls the flow of the material however, the trough could be dispensed with.

The operation is as follows: In starting up the machine when first installed, the cap screws e^6 , extending through the bottom member E, of the trough are loosened in the end frame members, permitting the tension of the springs to draw the trough firmly yet yieldingly against the cylinder. The cap screws may then be set up sufficiently to prevent any vertical movement of the trough and if desired any outward movement thereof from the cylinder. The cap screws g' , are then loosened and permit any suitable tool to be employed to press the packing strip G, against the periphery of the cylinder. This having been accomplished, the cap screws are again set up and the same is done for the end packing blocks g^3 , the trough first being packed with reference to the cylinder to afford tight joints with the cylinder. The carriers K, with the knives k , are next adjusted with reference to the cylinder. For this purpose, the jam nut k^4 , being loosened and the carriers pressed inwardly by means of said adjusting bolts until the desired degree of pressure is exerted by the edge of the knife on the periphery of the cylinder. The jam nut k^4 , is then again set up to hold said adjusting bolts from unauthorized interference. When so adjusted, it is obvious that the scraping knives are yieldingly pressed against the cylinder not so much by their own resiliency as by the action of the springs k^2 , which permit said knives to yield sufficiently to permit the blade of the knife to follow the periphery of the cylinder at all times, even though the cylinder might be very slightly out of true upon its journal. Cold brine at the temperature of zero Fahrenheit or any other suitable refrigerant is now admitted into the cylinder through the main D, and inlet pipe d^2 , the brine being delivered to the bottom of the cylinder must fill the same before it can escape from the outlet pipe d^3 , and main D'. Thus, the cylinder at all times is full of brine when in operation, thus presenting a very large volume of the refrigerant to exert its cooling action upon the material to be treated. The lard or other material may be delivered into the trough through the feed pipe X, and either partly or wholly sprayed onto the cylinder or taken from the trough, as the cylinder is rotated. The whole shell of the cylinder becomes coated with the lard or other material, the uniformity of the coating being regulated, of course, to avoid excess thickness by the doctor H. Inasmuch as this is easily adjustable from or toward the cylinder, the thickness of the coating can be controlled at the will of the operator. Any lard or other material dropped from the cylinder falls

upon the table M, and is thus delivered to the picker receptacle. All the adhering lard upon the cylinder is carried to the knives, which, as before described, are set at the most efficient angle to cut and scrape the same from the cylinder with the least possible resistance to the rotation thereof. The lard scraped or cut from the cylinder falls into the picker receptacle. Here, the action depends entirely upon what may be required. If, for instance, a mixing action is desired as, for instance, in those products in which it is desired to mix a considerable proportion of water or some other ingredient with the lard or other material, the blades are set accordingly. This may easily be accomplished by turning back the jam nuts, adjusting the blades to the desired angle and again setting up the jam nuts. In this manner, the mixing action of the picker blades may be regulated at will. If it is merely desired to work or process the lard and deliver the same to a discharge outlet, the picker blades are, of course, adjusted accordingly and the delivery from the receptacle may be wholly under the pressure exerted by the picker blades or may be assisted by a magma pump or in any suitable manner.

When it is desired to stop the operation of the machine, the operator passes to the rear of the machine and pulls down the rear edge of the table until the table inclines from the picker receptacle. In this position the water of condensation gathering upon the cylinder at rest, (and, of course, running from the bottom thereof) is directed by the table from the machine, thus any product remaining in the picker receptacle is not injured thereby and furthermore, the collection of water in the picker receptacle is obviated. Of course, should it be desired (as will usually be the case) to draw off the refrigerant from the cylinder, the pet cock or valve d^6 , in the outlet pipe is opened and pressure having been removed from the inlet pipe D, the brine or other refrigerant siphons back through the inlet pipe to the source from which the refrigerant is derived. This enables the condensation on the surface of the cylinder to be materially reduced when the machine is not in operation and also obviates the necessity of lowering the temperature of the large body of the brine or other fluid that would otherwise be contained in the receptacle when it is desired to again start up the machine. In other words, it enables the operation of the machine to begin immediately with the beginning of the rotation, inasmuch as fresh brine at zero Fahrenheit will, of course, be immediately pumped into the cylinder upon starting the same.

Obviously, very many details of the construction may be varied, and I therefore do

not purpose limiting this application for patent otherwise than necessitated by the prior art.

I claim as my invention:

1. In a device of the class described a rotatable and cylindric drum, a trough, one side of which is formed by the drum, and means yieldingly holding the trough against the drum.
2. In a device of the class described a rotatable and cylindric drum, a trough, one side of which is formed by the drum, means yieldingly holding the trough against the drum, and a downwardly directed scraper on the trough and bearing against the drum.
3. In a device of the class described a hollow rotatable cylindric drum, a horizontally slidable trough, one side of which is formed by the drum, guides secured to, and near the ends of the trough and bearing against the ends of the drum, and means acting to yieldingly press the trough against the drum.
4. In a device of the class described a rotatable cylindric drum, a horizontally slidable trough one side of which is formed by the drum, guides secured to the trough and bearing against the ends of the drum, means yieldingly holding the trough against the drum, and means for rigidly securing the trough in adjusted position.
5. A device of the class described embracing a horizontally rotatable cylinder, a horizontally slidable trough supported in close relation thereto and one side of which is formed by the cylinder, guides secured on the trough and bearing against the ends of the cylinder, packing means in the bottom and ends of the trough to bear against the cylinder, resilient means for adjusting the trough to the cylinder and means for locking the trough in adjusted position.
6. A device of the class described embracing a horizontally rotatable cylinder, a horizontally slidable trough supported at one side thereof, and one side of which is formed by the cylinder, guides secured on the trough and bearing against the ends of the cylinder, adjustable packing means in the bottom and ends of the trough bearing against the cylinder, resilient means for adjusting the trough to the cylinder and means for locking the trough in adjusted position.
7. A device of the class described embracing a horizontally journaled, rotatable refrigerating cylinder, a trough, one side of which is afforded by the cylinder and adjustably supported to positively bear against the cylinder, springs tightly holding the trough against the cylinder adapted to automatically adjust the trough to fit tightly against the cylinder at all times to compensate for wear on the contacting surfaces, a knife yieldingly supported on the trough and bearing for the entire length of the cylinder

against the periphery thereof at an acute angle and directed against the rotation thereof, and means for varying the tension of said knife against the cylinder.

5 8. A device of the class described embracing a horizontally journaled, rotatable cylinder, a trough, one side of which is afforded by the cylinder and adjustably supported to yieldingly bear against the cylinder, a knife supported on the trough and bearing for the entire length of the cylinder against the periphery thereof at an acute angle and directed against the rotation thereof, and springs for varying the tension of said knife against the cylinder.

9. A device of the class described embracing a rotatable cylinder adapted to contain a refrigerant, a trough, one side of which is afforded by the cylinder, packing means adapted to afford tight joints between the trough and the cylinder, means yieldingly adjusting the trough in operative relation, an obliquely set knife positioned below the trough and extending for the entire length of, and bearing against the cylinder, and adjusting means therefor including one or more springs acting to press the knife against the cylinder in operative position.

10. A device of the class described embracing a rotatable cylinder adapted to contain a refrigerant, a trough, one side of which is afforded by the cylinder, packing means in the bottom and ends of the trough adapted to afford tight joints with the cylinder, means adjusting the trough into operative relation, a knife supported below the trough and bearing downwardly and obliquely against the cylinder and adjusting means therefor including one or more springs adjustably bearing against said knife to hold the same in operative position at suitable tension.

11. In a machine of the class described the combination with the upwardly rotating cylinder and the trough for the material to be treated of means for tightly holding the trough against the cylinder and automatically adjusting the trough to compensate for any wear and thereby always maintain a tight joint between the trough and cylinder, knives supported below the trough and bearing against the periphery of the cylinder and means for independently and automatically forcing each knife against the cylinder.

12. In a machine of the class described the combination with the upwardly rotating cylinder and the trough for the material to be treated of which the cylinder forms one side, of knives yieldingly and slidably supported below the trough and bearing obliquely downward against the cylinder, and resilient means for adjusting the knives independently of any adjustment of the trough.

13. In a machine of the class described a rotatable refrigerating cylinder, a trough, a part of which is afforded by the cylinder and adapted to contain the material to be treated, and deliver the same to the cylinder, means adjusting the trough to the cylinder, knives slidably supported below the trough and bearing obliquely against the periphery of the cylinder and springs acting in conjunction with adjusting means to vary the pressure of the knives on the cylinder.

14. In a machine of the class described a rotatable refrigerating cylinder, adjustable means for delivering the material to be treated in a thin film over its surface, knives adjustably supported at one side of the cylinder to bear obliquely downward against the periphery of the cylinder and against its rotation and resilient adjusting means to vary the pressure of the knives on the cylinder.

15. In a machine of the class described a rotatable refrigerating cylinder, means delivering the material to be treated to the surface thereof, and slidably supported spring pressed knives acting to strip the chilled material from the cylinder and automatically adjustable independently of the support therefor.

16. In a machine of the class described a hollow cylinder journaled to rotate substantially horizontally, an inlet pipe extending to the bottom and an outlet pipe extending to the top of the cylinder and extending axially through the journals for the cylinder at each end thereof, means delivering the material to be treated to the surface of the cylinder, means adapted to strip the treated material from the cylinder, and a pet cock in the outlet pipe positioned above the cylinder whereby the contents may be siphoned from the cylinder through the inlet pipe when pressure is cut off from said inlet pipe and the pet cock opened.

17. In a machine of the class described a hollow drum journaled to rotate horizontally, an inlet and an outlet pipe for delivering refrigerant to the cylinder, means for delivering the material to be treated in a thin film to the surface of the cylinder, reciprocating knife carriers, knives rigidly secured thereto and directed at an angle therewith to strip the treated material from the drum, springs bearing against the carriers to automatically adjust the knives to take up wear thereon, and means for varying the tension of the springs, said means being non-connected with the knives.

18. In a machine of the class described end frame members, a hollow refrigerating cylinder journaled horizontally thereon, means for rotating the cylinder, means for maintaining a refrigerating circulation therein, a trough supported on the rising side

of the drum and one side of which is afforded by the cylinder, packing means in the bottom and ends of the trough bearing against the drum, downwardly directed scrapers or knives slidably supported below the trough and bearing obliquely against the upwardly rotating periphery of the cylinder, adjusting means acting to yieldingly press the knives or scrapers into engagement with the cylinder, and an adjustable gage supported above the trough and parallel the face of the cylinder and adapted to insure uniformity of thickness of the layer of material collected by the drum from the trough.

19. In a machine of the class described end frame members, a hollow refrigerating cylinder journaled thereon, means for rotating the cylinder, means for maintaining a refrigerating circulation therein, means delivering a film of the material to be treated on the surface of the cylinder, downwardly directed scrapers or knives slidably supported at one side of the cylinder and bearing obliquely against the periphery thereof for the entire length, adjusting means acting to yieldingly press the knives or scrapers into engagement with the cylinder, and an adjustable gage supported near the feeding means and parallel to the face of the cylinder and adapted to insure uniformity of thickness of the refrigerable layer collected by the cylinder.

20. In a machine of the class described a rotatable cylinder, an open sided trough supported at about the level of the axis thereof, and springs for forcing the trough against the cylinder which affords one side for the trough.

21. In a machine of the class described a cylinder, a trough yieldingly supported to bear at its open side thereagainst, knives adapted to bear against the periphery of the cylinder to scrape material therefrom, a picker trough or receptacle below said knives to receive the material, a rotatable picker shaft therein, picker blades on said shaft, and a tilting table supported below the cylinder to discharge into the picker trough when the machine is in operation and adapted also for adjustment to discharge away from the picker trough.

22. In a device of the class described a cooling cylinder, a trough for receiving the material to be cooled and delivering the same upon the cylinder, means for scraping the material from the cylinder, a receptacle for receiving the material scraped from the cylinder and means pivoted below the cylinder adapted to be inclined to deliver into the receptacle or to be inclined oppositely to deliver away from the receptacle.

23. In a machine of the class described, a cylinder, a receiving receptacle, a tilting table supported below the cylinder with its

forward edge resting on the receiving receptacle and adapted to be adjusted at an inclination toward or from the receptacle.

24. In a machine of the class described, a refrigerating cylinder, a picker trough, a tilting table supported below the refrigerating cylinder with its forward edge resting on the picker trough adapted to receive the material from the cylinder and adapted to be inclined toward or from the picker trough.

25. In a machine of the class described a picker trough, a rotatable refrigerating shaft therein and picker blades secured to the shaft adapted for adjustment to mix the material only, to deliver the material from the trough and to both mix and deliver the material from the trough.

26. In a machine of the class described a picker trough, a hollow shaft therein connected to receive refrigerant or steam therein to cool or heat the material in the trough and picker blades secured to the shaft adapted for adjustment to mix and treat the material or to deliver the material from the trough.

27. In a machine of the class described the combination with the stationary supports or frames and the rotatable refrigerating cylinder journaled thereon, of a trough, one side of which is afforded by the cylinder and slidably supported at its ends on said frames, a spring tension device engaged on the frame and the trough and acting normally to yieldingly hold the trough against the cylinder, and means locking the trough in adjusted position.

28. In a machine of the class described the combination with the stationary supports or frames and the rotatable refrigerating cylinder journaled thereon, of a trough, one side of which is afforded by the cylinder and slidably supported at its ends on said frames, a spring tension device engaged on the frame and the trough and acting normally to yieldingly hold the trough against the cylinder, means for locking the trough in adjusted position, and knives slidably supported below the trough to strip the coating from the cylinder.

29. In a machine of the class described the combination with a refrigerating cylinder and the trough, one side of which is afforded by the cylinder, of a packing strip adjustably, but rigidly secured in the bottom of the trough and bearing against the side of the cylinder, guides rigidly secured on the trough and bearing on the ends of the cylinder and end packing means adjustably secured thereto and closing the end of the trough against the cylinder.

30. In a machine of the class described the combination with the refrigerating cylinder and the trough, one side of which is

afforded by the cylinder, of a packing strip adjustably, but rigidly secured in the bottom of the trough and bearing against the side of the cylinder, guides rigidly secured on the trough and bearing on the ends of the cylinder and end packing means adjustably secured thereto and closing the end of the trough against the cylinder and springs connected to force the trough against the cylinder.

31. In a machine of the class described the combination with a rotatable refrigerating cylinder of a trough for the material to be treated, one side of which is afforded by the cylinder, threaded adjusting bolts projecting through the outer side of the trough at the top thereof, a gage bar or doctor comprising an angle bar, the flange of which is attached to the adjusting bolts and the web of which provides a straight edge and lies in close proximity with the cylinder to regulate the thickness of the refrigerable film of the material deposited on the cylinder, and a knife slidably supported to strip the refrigerated material from the cylinder.

32. In a machine of the class described the combination with the end frame members and the upwardly rotating refrigerating cylinder journaled thereon, of a trough slidably supported on the end frames and embracing an integral bottom, ends and one side, complementally apertured bosses on said end frame members and the extended ends of the bottom, a bolt extending there-through at each end frame, a tension spring secured on said bolt and bearing against the boss on the frame and acting to yieldingly bear the open side of the trough against said cylinder, and a cap screw extending through a transverse slot in each end of said bottom and engaging in the frame and serving as a guide in adjusting the trough and also adapted to rigidly engage the trough in adjusted position.

33. In a machine of the class described the combination with the end frame members and the rotating refrigerating cylinder journaled thereon, of a trough embracing an integral bottom, ends and one side, the bottom being of a length to rest on said end frames, complementally apertured bosses on said end frame members and said ends of the bottom, a bolt extending therethrough, a tension spring secured on said bolt and bearing against the bosses on the frame and acting to yieldingly bear the open side of the trough against said cylinder, means adapted to rigidly engage the trough to the frame, and scrapers slidably supported on the bottom of the trough and yieldingly pressed thereby against the cylinder.

34. In a machine of the class described a trough for material to be treated embracing an integral metallic bottom, side and ends, and guide plates of a width corresponding

approximately with the ends and bolted thereto and adapted to fit against the heads of the refrigerating cylinder which affords the remaining side of the trough.

35. In a machine of the class described a refrigerating cylinder, a trough for the material to be treated embracing an integral metallic bottom, side and ends, and guide plates of a width corresponding approximately with the ends and bolted thereto and adapted to fit against the heads of the refrigerating cylinder which affords the other side of the trough and sliding scrapers on the trough.

36. In a machine of the class described the combination with end frames and a rotatable refrigerating cylinder supported thereon of a table adjustably supported below the cylinder and adapted for adjustment in one direction to preserve material falling from the cylinder when in operation and adapted for adjustment in another direction to direct the water of condensation dripping from the cylinder from the machine.

37. In a machine of the class described the combination with end frames and a rotatable refrigerating cylinder supported thereon of a table adjustably supported below the cylinder and adapted for adjustment in one direction to preserve material falling from the cylinder when in operation and adapted for adjustment in another direction to direct the water of condensation dripping from the cylinder from the machine and gravity acting means for supporting the table when adjusted.

38. In a machine of the class described a rotative cylinder, means distributing the material to be treated thereon, a plurality of independently adjustable knives arranged along the periphery of the cylinder to scrape the material therefrom and means for independently varying the pressure of each knife on the cylinder.

39. In a machine of the class described a rotative cylinder, means distributing the material to be treated thereon, a support, and a plurality of knives, each slidable independently of the support and yieldingly adjustable against the periphery of the cylinder.

40. In a machine of the class described the combination with a refrigerating cylinder, a feed trough and a knife, of feed pipes extending to near the bottom of the trough and directing the discharge longitudinally of the trough and also directly against the cylinder.

41. In a machine of the class described the combination with a cylinder, a trough and knives of valved feed pipes extending into and near the bottom of the trough, and a tee on each with the branches directed longitudinally of the trough and perforated in the side adjacent the cylinder.

42. In a device of the class described a

cooling cylinder, means for spraying material thereon in a thin sheet or spray, means for spreading the material in a uniform film of the desired thickness on the cylinder, a knife for scraping the surface of the cylinder mounted to reciprocate and means for yieldingly holding the knife against the cylinder.

43. In a device of the class described a cooling cylinder, means for spraying material thereon in a thin sheet or spray, means for spreading the material in a uniform film of the desired thickness on the cylinder, a knife for scraping the surface of the cylinder mounted to reciprocate, means for yieldingly holding the knife against the cylinder, means for varying the tension of the knife against the cylinder, a receptacle for receiving the material and means for directing any material falling from the cylinder in a partially cooled state to the receptacle.

44. In a device of the class described a cooling cylinder, means for delivering the material to be treated thereon, means for scraping the material therefrom, a receptacle for receiving the material scraped from the cylinder and means in the receptacle adapted to be adjusted either to mix the material or deliver the same from the receptacle.

45. In a device of the class described a cooling cylinder, means for delivering the material to be treated thereon, means for scraping the material therefrom, a receptacle for receiving the material scraped from the cylinder, means in the receptacle adapted to be adjusted either to mix the material or deliver the same from the receptacle, and means for preventing dust entering the receptacle.

46. In a device of the class described a cooling cylinder, means for delivering the material to be treated thereon, means for scraping the material therefrom, a receptacle for receiving the material scraped from the cylinder, means in the receptacle adapted to be adjusted either to mix the material or deliver the same from the receptacle, means for preventing dust entering the receptacle, and means adjustable to deliver any material falling from the cylinder other than that scraped therefrom, into the receptacle.

47. In a congealing apparatus a cooling surface, means for delivering the material in a molten state thereupon, means for scraping the congealed material from the cooling surface, a receptacle for receiving the congealed material and means for catching any partly congealed material falling from the cooling surface and delivering the same into said receptacle by gravity of the material.

48. In a congealing apparatus a cooling surface, means for delivering the material in a molten state thereupon, means for

scraping the congealed material from the cooling surface, a receptacle for receiving the congealed material, and means for catching any partly congealed material falling from the cooling surface adapted in one adjustment to deliver said material into the receptacle and in another adjustment to deliver any water of condensation from the cooling surface outside of the receptacle.

49. In a device of the class described means for cooling material, a receptacle for receiving the same, and removable means pivoted above the receptacle and extending downwardly and bearing against the outer wall of the receptacle adapted to prevent admission of dust thereinto.

50. In a device of the class described means for cooling material, means for delivering material thereupon, means for scraping the cooled material from the cylinder, a receptacle for receiving the cooled material, removable means for guarding one side of the receptacle to prevent admission of dust thereinto, and means adapted to be adjusted to deliver material falling from the cooling means into the receptacle or out of the receptacle.

51. In a cooling apparatus, a cooling cylinder, means for delivering the material to be cooled thereupon, means for cutting the cooled material from the cylinder, a receptacle for receiving the cooled material, and means adapted to catch all material thrown from the cylinder before cooled and deliver the same to said receptacle.

52. In a device of the class described a cooling member, means for delivering the material to be cooled thereto, means for removing the cooled material from the cooling member, a receptacle for receiving the cooled material and mechanism in the receptacle for mixing the cooled material or adapted for adjustment to both mix and deliver the material from the receptacle.

53. In a device of the class described, a cooling apparatus, a receptacle for receiving the material therefrom, and an inclined member adjustable to deliver material into or away from the receptacle.

54. In a device of the class described, a cooling apparatus, a receptacle for receiving the material therefrom, an inclined member adjustable to deliver material into or away from the receptacle, and removable means forming a wall to prevent foreign matter entering the receptacle.

55. In a cooling apparatus a cooling cylinder, means for delivering material to be cooled thereon, ways supported adjacent the cylinder, knives slidable in said ways and springs for sliding each knife in its ways against the cylinder.

56. In a cooling apparatus a cooling cylinder, means for delivering material to be cooled thereon, ways supported adjacent the

cylinder, knives slidable in said ways,
springs for sliding each knife in its ways
against the cylinder, means for independ-
ently varying the tension of each spring
5 and an adjustable member for regulating the
thickness of the film of material carried by
the cooling cylinder.

In testimony whereof I have hereunto
subscribed my name in the presence of two
subscribing witnesses.

WILLIAM B. ALLBRIGHT.

Witnesses:

C. W. HILLS,

H. E. HANNAH.