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A. R. THOMPSON

1,837,502

EXHAUST BOX

Filed Dec. 13, 1929

2 Sheets-Sheet 1

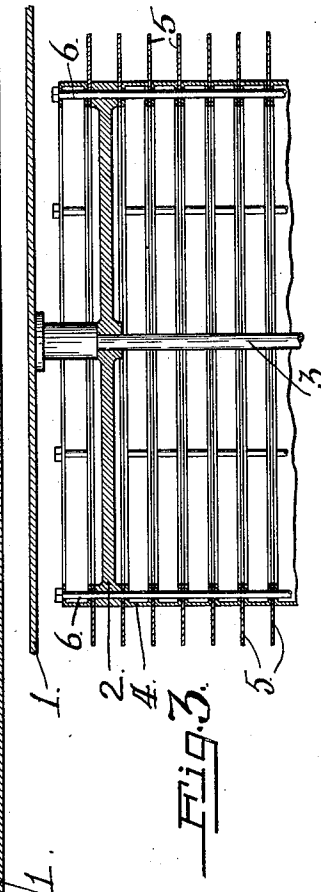
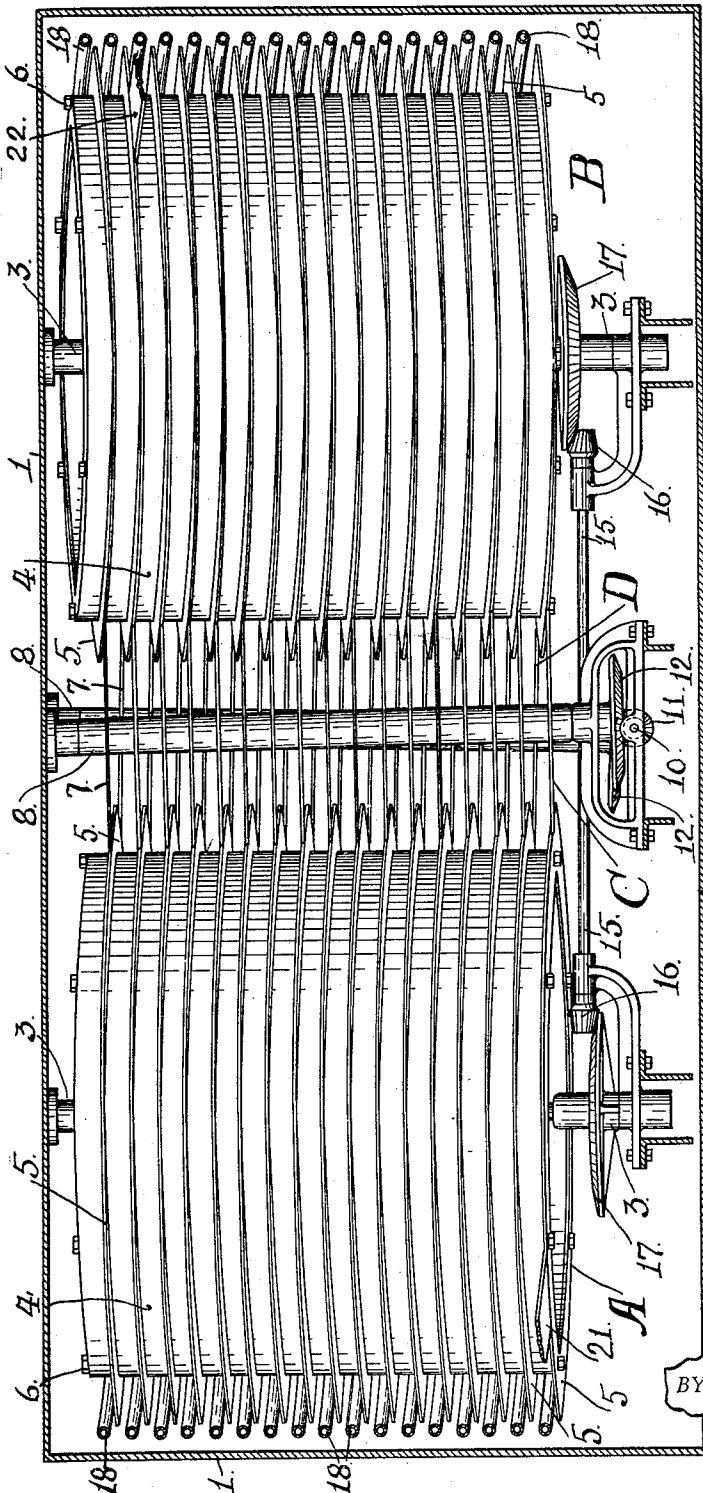


Fig. 1.

Fig. 3.

INVENTOR,
Albert R. Thompson
Booth & Booth
ATTORNEYS.

Dec. 22, 1931.

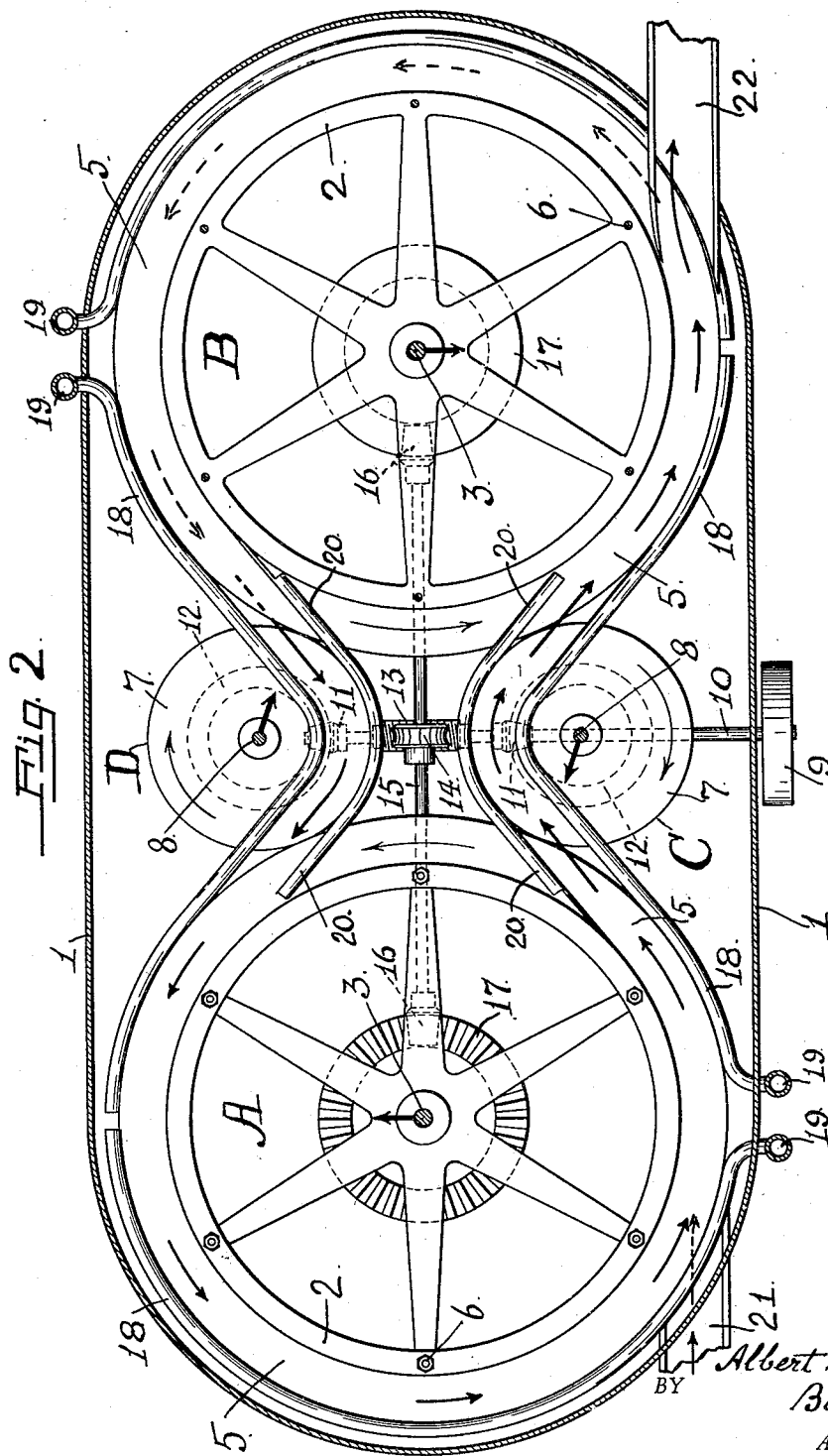
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2 Sheets-Sheet 2



INVENTOR,
t R. Thompson
Booth & Booth
ATTORNEYS.

UNITED STATES PATENT OFFICE

ALBERT E. THOMPSON, OF SAN JOSE, CALIFORNIA, ASSIGNOR TO ANDERSON-BARN-
GROVER MFG. CO., OF SAN JOSE, CALIFORNIA, A CORPORATION OF CALIFORNIA

EXHAUST-BOX

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My invention relates to that class of can-
ning apparatus which, from its function of
driving off the air by subjecting the comestible-filled, but still uncapped receptacles to
the heat of a first cook prior to hermetically
sealing them, is commonly known as an ex-
haust-box.

The general ends sought by the many im-
provements in exhaust-boxes are too well
known to those skilled in the art to need any
lengthy reference herein. It will suffice to
specify those of signal import, such as length
of can-path; unobstructed, smooth and fric-
tionless can-travel consistent with speed;
freedom from jarring in such portions of the
path as require shifting and switching;
avoidance of clogging tending to interrup-
tion of the swiftly moving can-procession;
protection of the exposed top of the can con-
tents from rubbing or spilling; elimination
of chains, belts, and like conveyers; and last,
but not least, economy in manufacture and
durability in use. These are the objects of
my invention and to such ends my invention
consists in brief statement as follows:—

Within a heated shell is mounted a pair of
upright main reels, each rotatable about a
tilted axis, and having a peripheral series
of spaced, annular shelves projecting there-
from; and a pair of transfer reels composed
of a series of spaced disks forming annular
shelves similar in function to those of the
main reels, the association of said shelves and
disks being such that, due to the direction of
rotation of the reels and the tilted axes of
the main reels, there is formed an ascending
can-path which receives the cans below and
delivers them above.

In the accompanying drawings, I have
illustrated my exhaust-box in its preferred
form, though it will be understood that
changes may be made therein without de-
parting from the spirit of the invention as
defined in the claims hereunto appended:—

Fig. 1 is a vertical section lengthwise
through the shell of the box, showing its
interior members in elevation, it being noted
that certain members, as, for example, the
guide and switch rails appear only in part or
are altogether omitted.

Fig. 2 is a horizontal section of the shell
showing the interior members in top plan.

Fig. 3 is a fragmentary section, showing
the preferred construction of the main reels.

1 is the shell of the exhaust box. Within
the shell is a pair of main reels, designated
generally by A and B; and a pair of trans-
fer reels C and D. The main reels are of
like structure which is illustrated clearly in
Fig. 3, each comprising spider-like head and
foot plates 2, one of which is shown in Figs.
2 and 3, an axis shaft 3 to which the head
and foot plates 2 are fixed, peripheral, annu-
lar spacing rings 4, preferably of channel
section, and annular, projecting shelves 5
clamped between the rings 4 by bolts 6 fitted
in and extending between said plates 2 and
which pass through the flanges of said rings.
The transfer reels are composed of a series
of spaced, disks 7 upon an axis shaft 8; said
disks forming annular shelves similar to the
shelves 5 of the main reels. The several
reels are assembled within the shell as fol-
lows. All are in approximately upright po-
sition but slightly tilted from the vertical,
each in its own given direction. This al-
though shown in Fig. 1, is more clearly in-
dicated in Fig. 2 by the heavy short arrows
pointing from the several shafts in the di-
rection of inclination thereof, said shafts be-
ing mounted suitably within the shell, and
adapted for rotation in predetermined direc-
tions, by means here shown, comprising, for
example, a pulley 9, Fig. 2, drive shaft 10
carrying the power into the box, bevel pin-
ions 11 on said drive shaft, a bevel gear 12
on each shaft 8 of the transfer reels C and D,
a worm gear 13, Fig. 2, on the drive shaft 10,
a worm 14 on a countershaft 15; pinions 16
on the latter shaft, and gears 17 on the axis
shafts 3 of the main reels A and B. It is to
be noted that the shelves of one of the main
reels are, with respect to those of the other,
elevated by a distance of one-half the shelf
spaces, this being clearly shown in Fig. 1,
by comparing reel B with reel A. The main
reels A and B are separated by a space in
which the transfer reels C and D are posi-
tioned, and the disks or shelves 7 of the lat-
ter reels, at their region of nearest approach

to or juxtaposition with the shelves 5 of the main reels A and B lie in the same plane with said respective shelves, thus providing for a smooth and even transfer; but, on account of the tilt of the reels, the disks or shelves of the transfer reels on their opposite sides coincide with shelves of the main reels of different elevation. 18 are guard rails associated with the shelves of the reels. These lead in through the shell 1 from manifolds 19, Fig. 2, in convenient lengths and in vertical series. In their best form they are tubes, and are supplied through the manifolds 19 with a heating medium, a heating feature well known in the art. 20 are short sections of switch rails associated with the disks or shelves of the transfer reels. 21 is the can inlet to the bottom of reel A, and 22 is the can delivery or outlet from the top of reel B.

A description of the operation of the box, by following the path of the cans, assisted by the arrows in Fig. 2, will lead to a clearer understanding of the structure, and will supply any possible deficiency in the foregoing specification.

It may be stated preliminarily that the multiplicity of shelves herein indicated and which provide for what appears to be an unusually long path, is due to the intent to use the box with flat fish-filled cans, which by reason of small height permit the shelves to be placed close together, and thus be present in large number. Also, it may be well to point out that, in Fig. 1, the apparent curvature of the shelves of the main reels, and which at first sight may suggest a helical arrangement, is due to the perspective caused by the tilting of the reels as herein described. Each shelf is a separate annulus and is not a helix.

The cans, filled with comestible, and as yet unsealed, are fed in through inlet 21 to the lowermost shelf of the main reel A, which reel, rotating anti-clockwise, carries said cans to the right on an approximately level course due to the direction of tilt of the reel. The cans are then switched by the directing rails 18 and 20 to the associated lowermost disk of the transfer reel C, said disk, due to the tilt of the reel, or other predetermined factor, coinciding at its receiving side with the lowermost shelf of the main reel A at its delivery side.

The transfer reel C, rotating clockwise, carries the cans along to the right and delivers them to the associated lowermost shelf of the main reel B; but it must be noted, that due to the upward tilt of this side of the disk of reel C, its delivery side is elevated to and coincidently joints that lowermost shelf of the reel B which is slightly higher as compared with the shelf of reel A from which said transfer disk received the cans.

The main reel B, rotating anti-clockwise, carries the cans around on said shelf on a generally ascending course until they are switched off by the rails 18 and 20 to and upon the associated lowermost disk of the transfer reel D. The reel D, rotating clockwise, and by its tilt having its delivery side elevated to coincide with the next higher or second shelf of reel A, transfers the cans to said higher shelf, by which they are carried around, on a generally ascending course, to a point at which they repeat their course of travel, upon the next higher shelves and disks, thus ascending shelf by shelf until they are discharged at 22. Thus, by the action of the several reels, with their annular shelves, the cans are carried along continuously on a tortuous ascending course. Friction is minimized, the only rubbing occurring between the sides of the cans and directing rails 18 and 20, and such slight sliding movement as occurs in transferring the cans from one reel to another. Moreover, there is practically no rubbing of the exposed contents of the cans, if projecting above the open tops, because the overlying shelf is moving at the same speed as the can, except for the slight intervals of transfer. Smooth and unobstructed travel is insured; chains, belts and like conveyers are eliminated; the cans are carried upwardly in a direction found desirable by subjecting them to increasing heat as they rise to higher levels; a long path of travel is provided; and finally, the specific structure of the reels is simple, economical, effective and durable both in manufacture and use.

I claim:—

1. In an apparatus for the described purpose, means for advancing a procession of cans in a tortuous ascending path, comprising a pair of approximately upright reels rotatable about relatively tilted axes, each reel having a peripheral series of spaced, annular shelves; and associated means for transferring the cans from the shelves of one reel to those of the other.

2. In an apparatus for the described purpose, means for advancing a procession of cans in a tortuous ascending path, comprising a pair of approximately upright reels rotatable about relatively tilted axes, each reel having a peripheral series of spaced, annular shelves; and a second pair of reels for transferring the cans between the first mentioned reels, each of said second reels having a peripheral series of spaced, annular shelves adapted to receive the cans from the shelves of one of said first mentioned reels and deliver them to the shelves of the other first mentioned reel.

3. In an apparatus for the described purpose, means for advancing a procession of cans in a tortuous path, comprising a plurality of approximately upright reels rotat-

able about relatively tilted axes, each reel having a peripheral series of spaced, annular shelves positioned to receive the cans from a preceding reel and deliver them to a succeeding reel.

4. An exhaust box comprising a shell having a can inlet and a can outlet; a pair of approximately upright reels within the shell, rotatable about relatively tilted axes, each reel having a peripheral series of spaced, annular shelves; and associated means for transferring the cans from the shelves of one reel to those of the other in a path leading from the shell inlet to its outlet.

5. An exhaust box comprising a shell having a can inlet and a can outlet; a pair of approximately upright reels within the shell, rotatable about relatively tilted axes, each reel having a peripheral series of spaced, annular shelves; and associated means for transferring the cans from the shelves of one reel to those of the other in a path leading from the shell inlet to its outlet, consisting of a pair of rotatable transfer reels having a series of spaced disks, with directional means for guiding the cans to and from the main reels.

6. An exhaust box comprising a shell having a can inlet and a can outlet; a pair of approximately upright reels within the shell, rotatable about relatively tilted axes, each reel having a peripheral series of spaced, annular shelves; the shelves of one reel alternating in elevation with those of the other; and associated means for transferring the cans from the shelves of one reel to those of the other in a path leading from the shell inlet to its outlet.

7. An exhaust box comprising a shell having a can inlet and a can outlet; a pair of approximately upright reels within the shell, rotatable about relatively tilted axes, each reel having a peripheral series of spaced, annular shelves, the shelves of one reel alternating in elevation with those of the other; and associated means for transferring the cans from the shelves of one reel to those of the other in a path leading from the shell inlet to its outlet consisting of a pair of rotatable transfer reels having a series of spaced inclined disks, with directional means for guiding the cans to and from the main reels.

8. An exhaust-box comprising a shell having a can inlet at a low level and a can outlet at a higher level; a pair of approximately upright main reels within the shell, rotatable about relatively tilted axes, each reel having a peripheral series of spaced, annular shelves, a lower shelf of said series being in communication with the shell inlet, and a higher shelf being in communication with the shell outlet; and a pair of approximately upright transfer reels, rotatable about relatively tilted axes, said transfer reels being com-

posed of a series of spaced disks, the shelves of the main reels and the disks of the transfer reels forming a can path which, due to the relative tilt and direction of rotation of the reels, ascends from the shell inlet to its outlet.

9. An exhaust-box comprising a shell having a can inlet at a low level and a can outlet at a higher level; a pair of approximately upright main reels within the shell, rotatable about relatively tilted axes, each reel having a peripheral series of spaced, annular shelves, a lower shelf of said series being in communication with the shell inlet, and a higher shelf being in communication with the shell outlet; a pair of approximately upright transfer reels, rotatable about relatively tilted axes, said transfer reels being composed of a series of spaced disks, the shelves of the main reels and the disks of the transfer reels forming a can path which, due to the relative tilt and direction of rotation of the reels, ascends from the shell inlet to its outlet; and directional means for guiding the cans throughout said path.

10. An exhaust-box comprising a shell having a can inlet at a low level and a can outlet at a higher level; a pair of approximately upright main reels within the shell, rotatable about relatively tilted axes, each reel having a peripheral series of spaced, annular shelves, a lower shelf being in communication with the shell inlet, and a higher shelf being in communication with the shell outlet; a pair of approximately upright transfer reels, rotatable about relatively tilted axes, said transfer reels being composed of a series of spaced disks, the shelves of the main reels and the disks of the transfer reels forming a can path which, due to the relative tilt and direction of rotation of the reels, ascends from the shell inlet to its outlet; and means for guiding the cans throughout said path comprising an ascending series of rail sections contiguous thereto.

11. An exhaust-box comprising a shell having a can inlet at a low level and a can outlet at a higher level; a pair of approximately upright main reels within the shell, rotatable about relatively tilted axes, each reel having a peripheral series of spaced, annular shelves, a lower shelf being in communication with the shell inlet, and a higher shelf being in communication with the shell outlet; a pair of approximately upright transfer reels, rotatable about relatively tilted axes, said transfer reels being composed of a series of spaced disks, the shelves of the main reels and the disks of the transfer reels forming a relatively close fitting can path which, due to the relative tilt and direction of rotation of the reels, ascends from the shell inlet to its outlet; and means for guiding the cans throughout said path comprising an

ascending series of rail sections contiguous thereto.

12. An exhaust-box comprising a shell having a can inlet at a low level, and a can outlet at a higher level; a pair of approximately upright main reels within the shell, rotatable about relatively tilted axes, each reel having a peripheral series of spaced, annular shelves, a lower shelf of one reel being in communication with the shell inlet, and a higher shelf of the other reel being in communication with the shell outlet; and a pair of approximately upright transfer reels rotatable about relatively tilted axes, said transfer reels being composed of a series of spaced disks, the shelves of the main reels and the disks of the transfer reels forming a can path, which, due to the relative tilt and direction of rotation of the reels ascends from the shell inlet to its outlet.

13. An exhaust box comprising a shell having a can inlet at a low level and a can outlet at a higher level; a pair of spaced approximately upright, main reels within the shell, rotatable about relatively tilted axes, each reel having a peripheral series of spaced, annular shelves, a lower shelf being in communication with the shell inlet and a higher shelf in communication with the shell outlet; a pair of approximately upright transfer reels between the main reels, rotatable about relatively tilted axes, said transfer reels being composed of a series of spaced, disks which, due to the tilt of all reels, are associated on opposite sides with the shelves of the main reels at a successively higher level in the respective main reels; and means for rotating all the reels in a direction to form an uprising can path from the shelves of one main reel over the disks of one transfer reel, to the shelves of the other main reel, and back over the disks of the other transfer reel to the shelves of the first main reel.

14. An exhaust-box comprising a shell having a can inlet at a low level and a can outlet at a higher level; a pair of spaced approximately upright, main reels within the shell, rotatable about relatively tilted axes, each reel having a peripheral series of spaced, annular shelves, a lower shelf being in communication with the shell inlet and a higher shelf in communication with the shell outlet; a pair of spaced, approximately upright transfer reels between the main reels rotatable about relatively tilted axes, said transfer reels being composed of a series of spaced disks which, due to the tilt of all reels, are associated on opposite sides with the shelves of the main reels at a successively higher level in the respective main reels; means for rotating all the reels in a direction to form an uprising can path from the shelves of one main reel over the disks of one transfer reel, to the shelves of the other main reel, and back over the disks of the other transfer reel to

the shelves of the first main reel; and means for directing the cans to follow said path.

15. An exhaust-box comprising a shell having a can inlet at a low level and a can outlet at a higher level; a pair of spaced, approximately upright main reels within the shell, rotatable about relatively tilted axes, each reel having a peripheral series of spaced, annular shelves, a lower shelf being in communication with the shell inlet, and a higher shelf in communication with the shell outlet, the shelves of one reel at their transfer points being in a plane midway between the planes of the shelves of the other reel; a pair of approximately upright transfer reels between the main reels rotatable about relatively tilted axes, said transfer reels being composed of a series of spaced disks which, due to the tilt of all the reels, are associated on opposite sides with the shelves of the main reels at successively higher levels in the respective main reels; and means for rotating all the reels in a direction to form an uprising can path from the shelves of one main reel over the disks of one transfer reel, to the shelves of the other main reel, and back over the disks of the other transfer reel to the shelves of the first main reel.

16. In an exhaust-box, a can-path reel comprising an axis shaft; a head member; a foot member; a peripheral series of separate, annular shelves; spacing rings of channel section separating the shelves; and bolts fitted in and extending between the head and foot members and passing through the flanges of said spacing rings for tying and clamping said parts together.

17. An exhaust box carrier means, comprising tiers of inclined, spaced disks rotating about a plurality of axes, the inclination of the disks being such as to deposit objects from one plane to a succeeding plane on successive disks, and means for driving the disks.

In testimony whereof I have signed my name to this specification.

ALBERT R. THOMPSON.