To all whom it may concern:

Be it known that I, JOHN H. THICKENs,
a citizen of the United States, residing at
Buffalo, county of Erie, State of New York,

have invented certain new and useful Im-
provements in Wall-Board; and I do hereby
declare the following to be a full, clear, and
exact description of the invention, such as
will enable others skilled in the art to which
it appertains to make and use the same.

The present invention relates to composite
wood pulp sheets suitable for use in build-
ings in place of lath and plaster.

It is an object of the present invention to
produce a wall board having high rigidity,
high tensile strength, low moisture absorp-
tion, high resistance to puncture and having
good heat-insulating and sound-deadening
properties.

It is a further object of the invention to
produce a composite wood pulp sheet which
is to some extent fire resistant, and which
can be used behind radiators, and around
registers, and the like without danger of
disintegration from the heat.

It is a further object of the present in-
vention to produce a wall board, smooth and
attractive on the surface, and well suited for
ornamentation and so constituted as to be
relatively free from warping, buckling and
excessive shrinkage, to the end that the
sheets of material may be nailed or tacked
to the studs of a room and there deco-
rated by painting or tinting to serve in
place of lath and plaster.

In accomplishing the foregoing objects and
others which will hereinafter appear,
I form the composite sheet or wall board
with a core of ground wood pulp to which
is secured a facing of cooked wood pulp.
The core may be multi-ply if desired, and
the facing may be on both sides of the core
and held in place with a silicate cement.
Preferably, the cooked wood facings are
covered with a thin layer of ground wood,
light in color, to facilitate ornamentation.

For a better understanding of the present
invention, reference is made to the ac-
companying drawing, wherein—

Figure 1 is a section, somewhat diagram-
matic in character, through a composite
sheet made in accordance with this inven-
tion, and Fig. 2 illustrates a modification in
which the ground wood core is multi-ply.

In the embodiment illustrated, the com-
posite sheet of Fig. 1 has a central core 1
of ground wood pulp made into the form of
a sheet, say one-fourth of an inch thick, by
usual methods. Ground wood pulp has a
short, hard fiber loosely matted together, so
that this core has good heat-insulating
properties and good sound-deadening prop-
erties. The core is not, however, highly re-
sistant to moisture, nor is it relatively
strong either in tension or to resist punc-
ture. According to the present invention,
this sheet of porous, ground wood pulp is
covered with tougher material, preferably
in the form of a facing on both sides, con-
sisting of sheets 2 and 3 of cooked wood
pulp cemented in place at 4 and 5 with a
sodium silicate cement. These sheets of
cooked wood pulp may be made from the
same kind of wood as the central core, but
instead of grinding the wood, it is cut into
two foot lengths and placed in a steam di-
gester and there cooked in steam for six to
eight hours at sixty to eighty pounds pres-
sure, and then mechanically reduced to the
form of pulp in usual manner. Cooked
wood pulp has a long fiber, and sheets made
therefrom are dense and have low moisture
absorption, and when applied as illustrated
in Fig. 1, give to the composite sheet, great
strength and rigidity, and make the sheet
highly resistant to puncture, this being a
characteristic of relatively great importance
in wall board. The sodium silicate used for
cementing the sheets together is to some ex-
tent fire resistant, but what is more impor-
tant for practical purposes, it is heat re-
sistant so that the composite board can be
used behind radiators, near registers and
steam pipes, and will not disintegrate from
the heat as would a composite board ce-
mmented with pitch or other similar com-
 pound.

It is not necessary that the cooked wood
be of the same variety as the ground wood
for the fact that the wood is cooked before
grinding makes possible the production of
a strong tough fiber from a large number
of woods. Consequently, in this way, it is
possible to utilize for wall board purposes
many varieties which are not now in use.

In cooking wood to produce the long
fibered pulp, the wood turns brown, where-
as ordinary ground wood is white, and in
order that users of this composite board may
decorate the board with light tints, it has
been found desirable to cover the cooked wood layers with thin surface facings 6 and 7 of ground wood. These facings may be very thin and they give to the composite sheet a smooth and satisfactory surface without impairing substantially its resistance to moisture, puncture and the like. Preferably they are put on the brown ply during the process of manufacture on the board machine and without the use of cement for the fibers of the facings, when thus applied, interlock with the brown fibers adjacent, to make a good board.

In the modification shown in Fig. 2, the central core is multi-ply and includes a plurality of ground wood sheets 8 and 9 covered on the outside with layers of tough cooked wood 10 and 11 all fastened together with sodium silicate cement. The dark cooked wood coverings are faced with ground wood layers 12 and 13 as before.

The composite sheets above described are sound-deadening and heat-insulating because of their central core of porous, short, hard, fibered ground wood, and they are rigid, strong and resistant to puncture, because of the outer sheets of cooked wood with long, tough fibers closely packed together. The density of the cooked wood coverings keeps down the moisture absorption and so prevents abnormal buckling, warping and detrimental deformation and the sodium silicate cement holds the several layers against danger of separation even under trying heat conditions.

In commercial manufacture, it is expedient to arrange the core and its covering sheets with the fiber or grain running cross-wise or at an angle, as disclosed in United States Letters Patent No. 1,063,941, issued June 3, 1918, to J. P. Lewis. This arrangement of the fiber structure may likewise be applied to the several plys of the multi-ply core. By thus crossing the grain, the mechanical properties are to some extent improved.

I am aware that the proportions and arrangement of the component parts of the sheet need not be as illustrated in the two figures of the drawing, and these are to be taken as but diagrammatic illustrations and as showing but two of several modifications embraced in the invention as defined by the appended claims.

I claim:

1. Wall board comprising a sheet of porous ground wood pulp with a covering therefor of tough cooked wood pulp.

2. Wall board comprising a core of porous ground wood pulp faced on both sides with tough cooked wood pulp cemented in place.

3. A composite wood pulp sheet comprising a core of porous ground wood pulp faced with a sheet of tough cooked wood pulp held in place with a sodium silicate cement.

4. A composite wood pulp sheet comprising a multi-ply core of porous ground wood pulp, said core being covered on each side with a sheet of tough cooked wood pulp held in place with a silicate cement.

5. A composite wood pulp sheet, consisting of a central core of porous ground wood, said core being covered on each side with a sheet of tough cooked wood, and a thin surface facing for said cooked wood sheets consisting of ground wood, light in color, to facilitate ornamentation.

6. A composite wood pulp sheet, consisting of a multi-ply core of porous ground wood sheets cemented together, sheets of tough cooked wood covering said core and secured thereto with a silicate cement, and thin surface covering for said cooked wood sheets, consisting of ground wood of light color.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN H. THICKENS.

Witnesses:
RALPH C. LOWARY,
MARGARET LYNES.