To all whom it may concern:

Be it known that I, JOHN SIMPSON, of Lewi-
sville, in the district of Chester and State of
South Carolina, have invented a new and im-
proved cotton-gin for ginning both long staple
and short staple cotton; and I do hereby de-
clare that the following is a full, clear, and ex-
act description thereof, reference being had to
the accompanying drawings, making part of
this specification—

Figure 1 being a side elevation of the gin;
Fig. 2, a longitudinal vertical section through
the center thereof, and Fig. 3 a view of the
saw-cylinder and saws detached.

Like letters designate corresponding parts
in the several figures.

The nature of my invention consists, first,
in making the alternate saws of a different di-
diameter from the intermediate saws, so that no
two can catch the same fibers, and thereby
break them, and in arranging the brush-cyl-
deer so that the brushes shall reach all the saws
and still be of equal lengths; secondly, in
certain improvements in the arrangement of
the machine for the purpose of more effectu-
ally discharging the cotton and of excluding ver-
mus. The saws are placed at the usual dis-
tance apart—say about three-fourths of an
inch—but the alternate ones, ff, are of greater
diameter than the intermediate saws, gg. The
difference of diameter need not be very great,
all that is necessary being to prevent any two
adjacent saws taking hold of the same fibers
of cotton. I usually make the larger saws, ff,
ten inches, and the smaller saws, gg, nine
inches in diameter, thus causing the former
to project half an inch beyond the latter. The
distance between the alternate saws ff being
too great to allow them to seize and break the
same fibers of any cotton, consequently the
long staple can be ginned as well as the short
 staple without injury thereto. The smaller
saws, gg, seize such fibers as fall between the
larger saws and carry them through the ribs,
thereby preventing any waste. This arrange-
ment of the saws does not in the least di-
minish the quantity of cotton which the ma-
chine is capable of ginning. The brush-cyl-
der B is arranged with alternate wings hh pro-
jecting radially outward as much beyond the
intermediate wings, ii, as the larger saws pro-
ject beyond the smaller. The brushes on the
wings hh sweep the smaller saws, gg, and those
on the wings ii sweep the larger saws, ff. The difference in the width of the wings causes
all the brushes to be of equal length, and con-
sequently of equal stiffness. The two sets of
brushes of course alternate in the direction of
the axis of the cylinder.

The ribs D and hopper A are constructed
with especial reference to giving a proper
rolling motion to the cotton therein. The
outline of the hopper approaches very nearly
cylindrical shape, the upper portion, b, of the
ribs, which form a part of its contour, being
curved so as to conform thereto, and the side
c of the hopper being nearly concentric with
the opposite side, but forming the arc of a
somewhat larger circle, thus rendering that
side of the hopper a little deeper than the
other in order that the cotton may by gravi-
tation move in a direction opposite to that of
the saws, which will consequently give the
mass a rolling motion in the direction indi-
cated by arrows x x x—Fig. 2. The middle
portions, c, of the ribs between the saws curve
upward to allow room for the saw-cylinder,
but the lower portions, d, again curve, so as
to conform to the cylindrical shape of the hop-
per. A removable board, a, slides into the front
and lower side of the hopper for the purpose
of affording access there into to move sub-
stances which may have lodged there.

Over the discharging-passage C (which in
my gin is longer from the brush-cylinder back-
ward than usual) is inserted a board, H, sub-
stantially as shown in Fig. 2, for the purpose
of filling the space in the upper part of the
machine in which said brush-cylinder would
operate to produce a current toward the saws,
and also of narrowing the passage C, whereby
a much stronger current of air is produced,
and consequently the necessity of adding a
spout outside of the machine to assist in dis-
charging the cotton is obviated. Said board
is hinged so that it can be turned up out of
the way when the brush-cylinder is to be re-
moved, which is accomplished by first raising
the lid G and lifting the side boards, E, from
the vertical grooves into which they slide.

Some cotton-gins have a stationary board
corresponding to the note-board I beneath the
saws and brushes, leaving an opening, n, un-
through which the motes fall. In my im-
proved gin this mote-board is made wide
enough to entirely close said opening n, and
is placed in grooves, so that it may be slid forward and backward at will, by which the blast of the fan is regulated in such a manner as to properly separate the cotton and motes. It is also used to entirely close the opening \( n \) when the gin is not in use. The opening \( m \) in the front of the machine is provided with a lid, \( L \), which is allowed to hang down, as represented in the drawings, when the machine is in operation, but is made to shut said opening when the machine is laid by. A similar lid, \( M \), is provided for closing the discharging-passage \( C \). The object of this closing up all the openings to the inside of the machine is to exclude vermin, and especially rats, which are well known to be exceedingly troublesome by eating up the brushes if left within their reach. This annoyance is so common that it is the general practice to take the brushes out of the gins every night after using and put them where the rats cannot reach them. With the device just described the above precaution is unnecessary.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. Making the alternate saws of a greater diameter than the intermediate saws, in order that no two adjacent ones may seize the same fibers, and thereby break them, but at the same time to gin as completely and rapidly as if the saws were all of the same diameter.

2. Arranging the brushes which sweep the smaller saws upon alternate wings projecting out from the center as much farther than the intermediate wings which bear the brushes for the sweeping larger saws as said saws project beyond the others, for the purpose of rendering the brushes all of a uniform and suitable length.

3. Arranging the motive-board \( I \) so as to slide backward or forward, for regulating the strength and direction of the blast, and properly separating the motes from the cotton, and also to be used as a lid to entirely close said space when the gin is not in use, substantially in the manner and for the purpose herein set forth.

The above specification of my improved cotton-gin signed by me this 21st day of April, 1855.  

JOHN SIMPSON.

Witnesses:
J. S. BROWN,
CLEM S. STUKE.