

Jacksonville, Florida,

March 10, 1869,

Dear Sir,

I have the honor to acknowledge the receipt of your letter of the 7th inst. in relation to the use of the word "Spongy" in the title of the patent for the improvement in the manufacture of sponges, and in reply to inform you that the word "Spongy" is more commonly used than any of the general appellations, and as it involves no possible damage to the Patent, it certainly is preferable to any other.

I am, Sir, very respectfully,
 Yours,
 J. M. Smith

if it be successfully used
In my own experiments,
I have been very generally
successful with the ten Anterior
Teeth of the Superior Maxilla
in fact, I may say uniformly
so. By employing
this Agent, I have been
successful in a number of
cases in removing all the
teeth of the Upper Jaw, with out-
pain. I have also been
successful in a few cases in
the Superior Maxilla - but
not-uniformly so. I think
it will generally fail in the

lower form on account
of the Saliva, and the
fluid from the instrument
gathering about the points to
be frozen preventing its ac-
complishment.

The spray of Riqueline
is much better for use in the
mouth than that of Ether.

For the reason, that the
vapor of the Ether, enters the
lungs of the patient in
such great quantities, that
more or less strangulation
and coughing is the result,
interfering seriously with

with the operation.

While the spray of
Rijolmie produces no unpleasantness, you will find an advantage in drying the membranes to be frozen before applying the spray.

In using the spray commence high up on the gums and draw gradually down over the tooth, by thus doing you will prevent the pain induced by dashing it onto the crown of the tooth (If the pulp is dead this precaution will not be

necessary.) Continue the spray until the gums are white; don't be afraid of freezing too much it will do no harm. Freeze three or four at once if there are that many together to be extracted, and get them out very quickly.

I have used the spray to great advantage in cases of sensitive denture, after having failed with Chloral of Zinc and spirit, where it can be conveniently applied much better.

6
way made of applying
it - is this (when I have no
assistant) after having
placed a very small wire
in the inner tube of the in-
strument - (Richardson's) so as
to lessen the spray one
half or two thirds dash the
stream full into the cavity,

This produces some pain
but for only a moment,

as soon as the pain ceases
give the bellows to the patient -
with instructions to blow when-
ever they feel any pain,
(You bal-ting^a blow) then

holding the spray, for instance,
in the left-hand, turn
the point-away from the
cavity, to some portion of
the crown of the tooth, where
the spray will not interfere
with the operation, then take
your instrument and excavate,

during this operation,
you will find it necessary
to remove the ice from the
tooth frequently, as the spray
will have no effect upon
the tooth even through a
thin coat of ice, the same
is true of the soft parts

8
Pulps of teeth may also
be removed by the same plan
except that a larger blast-
of spray will be necessary.

You need not fear
any injury to the pulp of
a tooth from using the spray
in sensitive dentine. I am
in the habit of using it
whenever I have sensitive den-
tine to deal with, and have
experienced no trouble whatever
from it and have had
some cases frozen for the
space of thirty minutes.

I send you a paper

I find in my desk
which was written some time
ago, from which you may
gain some items, possibly.

You will please return it;
not that it is so valuable,
but that I wish to keep it
as a relic.

I forgot to say, that in
case of toothache where the
nerve is exposed, and very
irritable, the pain will be
much lessened by stopping
the cavity with wax before
applying the spray, even
the whole crown may be

20
enveloped in wax, which lessens
the pain still more.

I can send you the
plate you speak of.

I have been sick nearly three
weeks and am now just-
beginning to walk out a little.

Hope to be operating again
in a few days.

The Nebulizer

This is the name given to an instrument recently invented for the purpose

of producing a very fine spray from any liquid.

This spray is used for various purposes. Physicians use it for subdividing medicines to be taken into the Lungs by inhalation for the cure of diseases located there.

It is also used for the distribution of perfumes

for the lœlet-roc, and
for distributing disinfectants.

The only intended however
to speak of its use in the
production and application of
cold for the purpose of ob-
taining local Anæsthesia.

It has been found that
when a very volatile liquid is
subdivided into a very fine
spray, and blown from this
instrument, that an intense
degree of cold is produced by the
rapid evaporation of the liquid.

The degree of cold is found
to vary in accordance with the

volatility of the liquid used,
Hence before, Sulphuric Ether
has been the most volatile
liquid known; and when
blown through the instrument
produces a very intense cold.

A recent discovery how-
ever has placed in our hands
a new production from Kerosine
called Rigoline which
surpasses Ether in lightness
and volatility, boiling at
the astonishingly low ^{temperature of} _{70°} degrees
Any experiments have been
mostly with this liquid,

For an experiment upon

24
the bulb of the thermometer
the mercury was readily
brought to 14° below zero, when
the ice gathered so thickly
around the bulb it was
practically effectually screened from
the blast of the instrument.

This degree was produced
upon a large bulb in about
one half minute time.

This experiment shows
plainly what degree of cold
may be produced and now
it remains for us to speak
of its application and its
results in producing local Anæsthesia.

My experiments have been
mostly made in operations upon
the mouth, embracing about-
seventy cases of extraction of
the entire denture, also
some eight or ten operations
for Alveolar Abscess.

In these operations
I have discovered several un-
thought-of difficulties, all of
which may perhaps be explained
upon scientific principles and
perhaps, ^{be} mostly, or entirely, overcome.

In applying the spray
for making a simple incision,
I have found no difficulty

in producing the most-profound
Anæsthesia, except in one
case where an incision half
an inch in depth was made
in a very severe ^{acute} Abscess
This patient complained of
pain showing that the lance
passed farther than the cold
had penetrated, or at least
a sufficient degree of cold
to produce the desired result

To produce Anæsthesia
I suppose a sufficient degree of
Cold must be infused
into the parts to stop the circulation
and destroying for the

time being the nervous force
in the part to be operated upon

The precise degree of cold
necessary for this is not very
easy to determine. It is my
opinion however, that it is
to be found something above
the freezing point - as I have
noticed that in several cases
I have extracted teeth, when
no sign of whitening of the
gums whatever could be seen,
and yet, the patient give
no signs of pain, and
afterward declare that no
pain was felt. This has

8
been repeated some half dozen
times during my experiments,
obtaining like results in
about one half the cases.

These results though irregular
seem to indicate very strongly
that the point of insensibility
may be above the freezing point.

I generally bring the parts
to be operated upon to a white
frost, that is to say the sur-
face of the parts, for I do
not think I have ever produced
an absolute frost, penetrating
to the depth of the end of
the root of the Cuspid tooth.

The results have varied considerable though I believe the great majority of the cases have been painless, at least so my patients have affirmed a number of them, however, have been unsatisfactory, and strange to say some painful cases have been those which were apparently the most thoroughly frozen.

I think this may be accounted for however.

You are all aware, if you have thought upon the subject that in different-

70
Constitutions and temperaments
the capillary circulation
differs greatly in power and
rapidity. Now it is reasonable
to suppose that the more
powerful this circulation, the
more intense the cold must
be to arrest it, and at the
same time the greater the
rapidity of the circulation the
more rapidly (during the ap-
plication) is the chilled blood
changed for warm, thus
increasing the difficulty of
diminishing the temperature
of the part. This explains

one extreme, now we will
look to the other.

In those constitutions and
temperaments, where the capillary
circulation is sluggish
and weak, we find them
very readily and quickly
frozen, so that the surface
becomes perfectly white, but
upon thrusting in a knife
we will find the tissues
frozen only skin deep and
the parts beneath very sensitive.

The reason for this seems
to be, that the circulation
being slow the resistance

to freeze is slight; while at the same time the part itself is a less perfect conductor, on account of its circulation being less rapid,

while the frozen crust on the surface becomes almost a non conductor its particles being entirely at rest;

consequently we find that in these cases though we easily obtain a very perfect freeze upon the surface we find it exceedingly difficult to penetrate to any great depth, unless indeed we

71
should give no heed to
the intensity of the freeze
at the surface.

It is of some interest
to inquire, what the effect
upon the parts will be after
the freeze has passed away.

We know that there is
often very serious effects
arising from the freezing
of parts of the body, by the
natural cold of winter, and
I have had some inquiries
about applying such intense cold.

Having a case where a little
sloughing of the gums

124
could not result in any
serious evil & determined to
test this accordingly, & froze
the part as thoroughly as
possible, the gums which
were soft- became so rigid
as to be a serious obstacle in
extracting a root- of a tooth
imbedded in them, I failed
to cut them away with a
light- lance & then cut
through or rather broke through
them with a pair of sharp
forceps, pieces broke off
them the gums while I
was getting out the root

showing that - they were
so hard frozen as to have
become quite brittle, and the
instruments would rattle
against - them as if they
were ice. I had a fair
opportunity to notice this
case afterwards, and
expected to see some slough-
ing, but nothing of the
kind showed itself, and
the case healed as readily
as any other case of
extraction.

I have watched for
symptoms of frost-bite

as closely as possible, but
have failed to discover
any.

I have frozen one of
my own fingers more than
two dozen times, without
possessing more than a very
slight-tenderness.

I think no one need
apprehend any danger of evil
results in this direction,
though I still make it a
point to avoid excessive
freezing.
