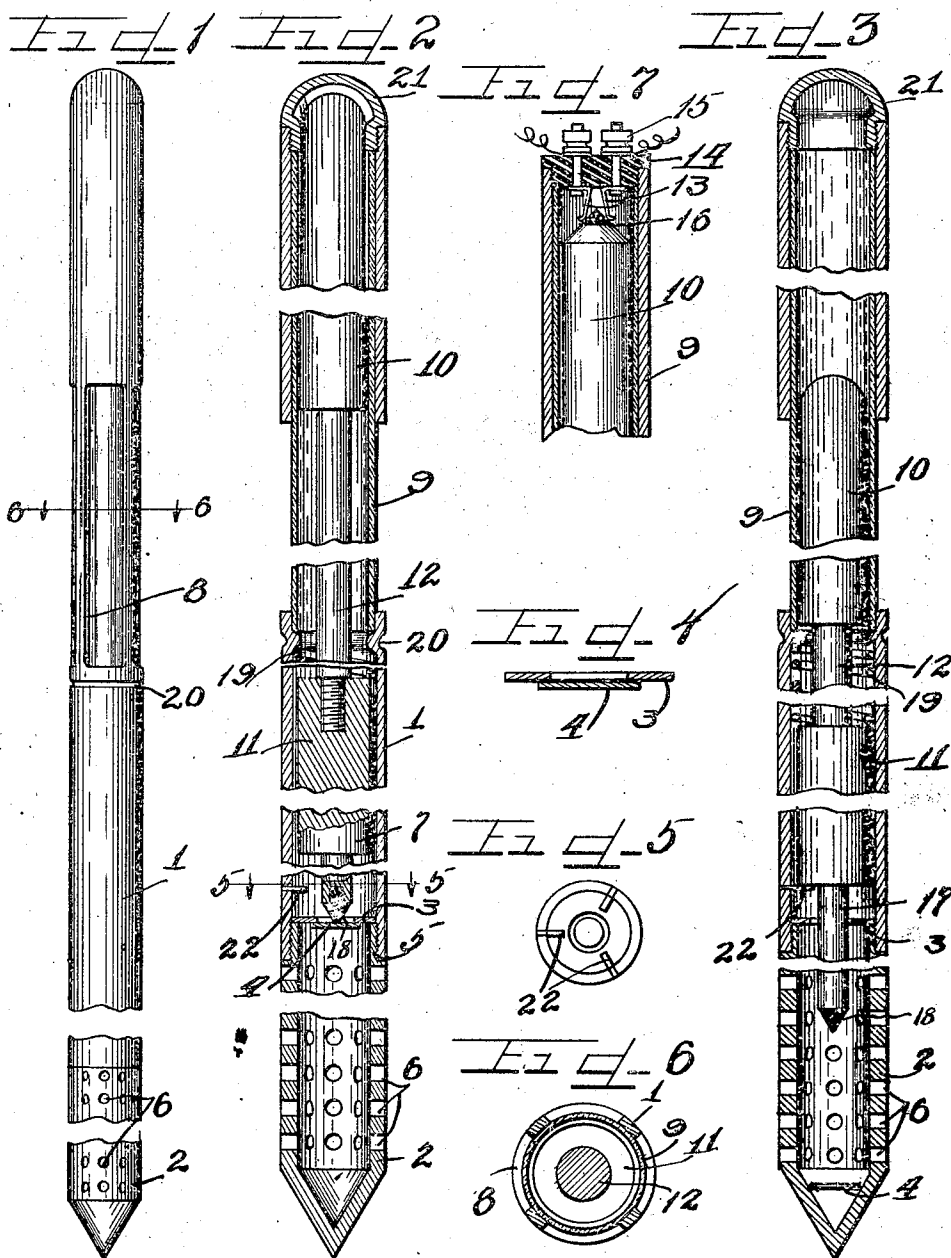


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J. SWANBERG.
TEMPERATURE INDICATOR.
FILED DEC. 18, 1919.



Witnesses

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UNITED STATES PATENT OFFICE.

JULIUS SWANBERG, OF CHICAGO, ILLINOIS.

TEMPERATURE INDICATOR.

Application filed December 18, 1919. Serial No. 345,695.

To all whom it may concern:

Be it known that I, JULIUS SWANBERG, 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 a Temperature Indicator; 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 numerals of reference marked thereon, which form a part of this specification.

This invention relates to temperature indicators, and although not limited to such use, is particularly applicable for indicating when the temperature in a stack of harvested material, such as hay, corn or the like, has exceeded safe limits or become so high as to injure the material.

It is an object, therefore, of this invention to provide a device which may be thrust into that part of the stack whose temperature is to be watched and which will give suitable indications or signals when the predetermined temperature has been exceeded.

Another object of the invention is to provide an indicating device which will give visual signals of excessive temperatures without the aid of electrical batteries, circuits or complicated mechanical apparatus.

Other and further important objects of this invention will be apparent from the disclosures in the specification and drawings.

The invention (in a preferred form) is illustrated in the drawings and hereinafter more fully described.

In the drawings:

Figure 1 is a side elevation of a device embodying the features of the present invention.

Figure 2 is a longitudinal central section through the device prior to operation by rise in temperature.

Figure 3 is a view similar to Figure 2 showing the position of the parts after operation.

Figure 4 is a transverse central section through the thermostatic device.

Figure 5 is a section on the line 5—5 of Figure 2.

Figure 6 is a section on the line 6—6 of Figure 1.

Figure 7 is a view showing a modification of the invention.

As shown in the drawings:

In the construction illustrated a tube 1 is

provided having a pointed cap 2 at one end to allow such end to be thrust into a stack of harvested material which is liable to become heated, such as hay, corn or the like. Signalling devices are provided at the other end of the tube operated by thermostatic apparatus adjacent the pointed cap whenever the temperature around the cap exceeds a predetermined limit.

The thermostatic device may conveniently consist of an annular ring 3 to the underside of which a disc 4 is secured by readily fusible metal or other material. As shown the ring 3 is held in position in the lower part of the tube 1 by resting upon the threaded nipple 5 on the end of the cap 2.

Perforations 6 are provided in the cap 2, and, if desired, an inwardly projecting shoulder may be provided against which it may be clamped by said nipple so that the air, steam or other gases in the stack may come into contact with the ring 3 and disc 4, so as to melt the fusible material as soon as the temperature of the stack at that point exceeds the melting point of the material.

The disc 4 supports the lower end of a plunger 7, slidably mounted within the tube 1, until the fusible material melts and allows the disc 4 and with it the plunger 7 to fall.

This movement of the plunger may be arranged to give indication that the temperature in the stack has exceeded the predetermined limit in various ways. In the drawings both a visual and an electric method have been shown.

In Figures 1, 2 and 3 the tube 1 is provided with a series of slots 8 arranged symmetrically around the tube within which is located a glass tube 9, so that the plunger is visible from the outside, while at the same time the entrance of hay, straw, leaves or dirt into the interior of the tube is prevented.

The plunger 7 comprises an upper part 10, conveniently colored red, a lower part 11 and a connecting rod or spindle 12, conveniently colored white for the purpose of enabling the position of the plunger to be readily determined. Normally the white rod 12 is visible through the windows in the tube 1 formed by the slots 8 and the glass tube 9. When, however, the plunger 7 drops the red portion 10 becomes visible and acts as a warning to the owner of the stack. In order to prevent the plunger moving further than necessary fully to expose the red por-

tion 10 to view, suitable stop mechanism may be provided, such as pins 22, adapted to engage the lower part 11 of the plunger, as shown in Figure 3.

5 In the construction indicated in Figure 7, the plunger is arranged to hold a pair of electrical contact springs 13, separated so that when the plunger falls the contacts spring together and close a circuit through
10 a bell, lamp or other signalling device. These contact springs may conveniently be mounted on an insulating block 14 threaded into the end of the tube 1 and provided with suitable terminals, as 15. On the end of the
15 upper part 10 of the plunger is mounted an insulating block 16 to avoid short circuiting of the contacts by the plunger. In the structure shown in Figure 7, provision is made for both electrical and visual signals, the
20 upper part of the glass tube for the latter being shown at 9.

It is desirable that as little of the heat communicated to the ring 3 and disc 4 by the gases passing through the perforations 6
25 be conducted away by the plunger. Consequently the lowermost end 17 of the plunger 7 is reduced in diameter and provided with a conical tip 18 of heat insulating material, such as wood or the like.

30 While usually the weight of the plunger may be utilized to operate the signal, it is also desirable that the apparatus may be thrust horizontally into the stack and for that purpose a spring 19 is provided for
35 pressing the plunger against the disc 4. This spring bears on one side against the part 11 of the plunger and on the other against an annular shoulder 20, formed by indenting the wall of the tube. This shoulder
40 20 also serves the purpose of restricting movement of the glass tube 9 in one direction, while movement of the tube 9 in the opposite direction is prevented by the cap 21.

The operation is as follows:

45 The device is thrust into a stack of harvested material with its pointed end substantially in the center of the stack and its opposite end exposed so that the position of the plunger in the tube may be readily observed.

50 When the temperature in the middle of the stack has risen sufficiently to melt the readily fusible material which secures the disc 4 to the ring 3, the plunger slides in the tube under the action of the spring 19, and
55 also its own weight if the tube is vertical or vertically inclined. This movement of the plunger brings its red portion 10 into view.

As soon as the owner of the stack sees the red portion he pulls out the indicator and
60 turns over the material of the stack to allow it to cool off.

The indicator is re-set for further use by unscrewing the cap 2, removing the ring 3 and the loose disc 4 and inserting a second
65 ring 3 with a disc 4 attached thereto by fus-

ible material. In this way the indicator may be used an indefinite number of times, each time inserting a fresh thermostatic disc.

I am aware that numerous details of construction may be varied through a wide
70 range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted otherwise than necessitated by the prior art.

I claim as my invention:

75 1. A temperature indicator comprising a tube having a window in one side thereof, a member slidable therein having parts of different color adapted to register successively with said window, a spring for moving said
80 member and means for holding said member and spring in retracted position until a predetermined temperature has been reached.

2. A temperature indicator comprising a tube having a window in one side thereof, a
85 member slidable therein having parts of different color adapted to register successively with said window, and means for preventing movement of said member until a predetermined temperature has been reached. 90

3. A temperature indicator comprising a tube having an opening in one side thereof, a member slidable therein having parts visually distinguishable from each other adapted
95 to register successively with said opening, an annular ring in the tube below the slidable member, a disk secured to said ring by readily fusible material, and a heat insulating tip on said slidable member in contact
100 with the disk.

4. A temperature indicator comprising a tube, a perforated cap threaded into one end
105 of the tube, a renewable disc between said cap and said tube comprising an annular member and an inner central member secured together by readily fusible material, a member slidable in the tube bearing against
110 said inner member, and signalling means operated by sliding movement of the member when released by the melting of the readily
fusible material.

5. A temperature indicator comprising a tube having a window adjacent one end
115 thereof, a perforated cap threaded into the other end of the tube, an annular ring clamped between said cap and said tube, a disc secured to said ring by readily fusible material, a member slidable in the tube having
120 at one end parts of different color adapted to register successively with said window, and a spring for pressing the other end of the member against said disc whereby melting of the readily fusible material results in
movement of said member.

6. A temperature indicator comprising a
125 metal tube having a series of longitudinal slots symmetrically arranged around one part of the tube, a glass tube within the metal tube closing said slots, a member slidable in said tube having parts of different
130

color adapted to register successively with said slots, additional electrically operated signal means operated upon movement of the member, and means for preventing movement of said member until a predetermined temperature has been reached.

7. A temperature indicator comprising a tube, a perforated removable cap for the lower end of the tube, replaceable fusibly connected members supported by said cap in said tube, a member resting thereon and slidable in said tube, and electrical contacts in the top of said tube normally sepa-

rated by said slidable member and adapted to spring together when the slidable member is released by the separation of the fusibly connected members due to the fusing of the connecting material.

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

JULIUS SWANBERG.

Witnesses:

EARL M. HARDINE.

CHARLES W. HILLS, Jr.