



# UNITED STATES PATENT OFFICE.

JOSEPH HELLER, OF PEORIA, ILLINOIS.

REFRIGERATOR SHOW-CASE.

1,237,644.

Specification of Letters Patent. Patented Aug. 21, 1917.

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To all whom it may concern:

Be it known that I, JOSEPH HELLER, a citizen of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Refrigerator Show-Cases; and he does hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention pertains to refrigerator show cases or counters having particular reference to show cases or counters for meats and other perishable goods.

The object of the invention is to provide a show case or counter that will maintain goods at a sufficiently low temperature to keep said goods in perfect condition for long periods of time.

Another object is to provide a new and novel structure in a show case or counter by which cold air currents will be directly delivered at the middle of the containing-space for the goods, being brought from opposite ends of said case.

Another object is to provide an interior structure for a counter in which the cold air is brought from opposite ends and deposited through conduits at the bottom of the containing-space and delivered at the middle of said space and deflected upward to meet the air in the upper portion in such a manner as to result in a continuous circulation of the currents.

Besides these objects the invention pertains to certain details of construction as will be pointed out in the following specification aided by the accompanying drawing, wherein,

Figure 1 is a vertical longitudinal section of the device.

Fig. 2 is a plan of the device, a portion only of the top being shown; and

Fig. 3 shows, in perspective, certain conduits which assist in realizing the objects of the invention.

A A represent the ends of the case, B its bottom and C the top. D D indicate partitions spaced from the end walls of the case to create compartments E E for the refrigerating medium, the said top C being

furnished with suitable hinged closures F of any desired number found most convenient for reaching the interior containing-space for the goods.

G is a shelf in the form of a grating located substantially midway of the height of the containing-space H for the goods, said shelf being supported upon the partitions D, for example. J indicates a lower shelf spaced from the bottom B and also having the form of a grating especially at the middle of its length through which the cold air currents are forced upwardly as will be understood presently.

K is a shelf within each of the compartments E spaced from the bottom B, and by preference in the form of a grating, through which the air currents can descend and upon which is supported a receptacle L for containing the refrigerating medium—ice or ice and salt, or said grating may support a refrigerating apparatus of any approved type not necessary to illustrate, since well known.

In each partition D at or near the top just beneath the top C is an opening M. At the bottom of the partition, also, is an opening N between the shelf J and the bottom B, all of the openings M N preferably extending substantially the full width of the containing-space. Upon the bottom B is a series of conduits for conducting air constructed of any desired material and occupying the entire width of the bottom as clearly shown in Figs. 2 and 3. These may consist of separate conduits of any desired number, but three being shown in this instance at opposite ends of the counter, the outer ones being represented by O and the inner one, or middle one, by the reference character P. The front and rear walls represented by A' and A<sup>2</sup> respectively may constitute the outer walls of the conduits O, as shown in Fig. 2, or special walls Q may be employed to serve the purpose, as shown in Fig. 3, there being intermediate walls R by which the said conduits O P are created.

The outer terminals of the conduits terminate at the partitions D and directly communicate with the openings N at the bottom of the partitions D so as to receive cold air currents from the compartments E. The

inner ends, however, terminate near the middle of the containing-space H, the two series of conduits being spaced apart as clearly shown. The middle conduit P, however, is shorter than the others and preferably, as shown in Fig. 2, is slightly less in width and capacity, the purpose of which will be explained.

The flow of the air currents is as follows:—

The cold air from the receptacles L descends on all sides of the same through the space surrounding them and passes into the conduits O P as indicated by the darts. From said conduits the currents are delivered against one another at the middle of the containing-space H passing upward through the gratings or shelves J G meeting the warmer air above and reducing the temperature of the same. Due to the draft formed by the descending currents within the compartments E the air is drawn into the upper portions of the latter through the upper opening M of the partitions D, which, upon being reduced in temperature by the refrigerating medium, descend through said compartments E to the conduits O P, a continuous circulation being thus set up.

The air currents in flowing from the conduits O P and in impinging upon one another are forced to arise, being aided by the upward tendency of the upper warmer currents so that the necessary circulation is absolutely established, the whole interior space being thoroughly cooled in consequence.

The slight ventilation furnished by screened openings S also furnishes a slight amount of warm air within the compartment H which assists in the travel of the air currents toward the compartments E, which is also true when air is admitted through the top openings whenever the closures F are raised.

The outer conduits O although slightly longer are somewhat greater in area than the middle ones P furnishing slightly less resistance to the passage of the air currents through them than the narrower passages P.

My purpose in constructing the conduits O P in the manner described is that in covering the entire bottom of the containing space H the flow of cold air will be evenly spread over said bottom. That is to say, air since lying nearest the outer or side walls A' A<sup>2</sup> would have a slight tendency to be warmer and perhaps result in adverse air currents, but by making the conduits of less resistance than the inner one the greater volume of cold air passing through them will force the air in the proper direction and over the entire bottom area.

My structure differs from the art in spacing the ends of the two series of conduits from one another so as to provide a separation space between said ends extending from

wall to wall. The cold air is thus delivered in a solid bulk and large volume to the middle of the case which would necessarily be the warmest, and there are no registers or gratings to retard the flow from said conduits. A much freer circulation is thus made possible. The greater volume of cold air carried by conduits O at the outer walls being larger than that carried by the inner ones P greatly assists in the proper cooling or refrigerating process. That is to say, since the warmer portions of the containing space will naturally be at the outer walls the conduit having the least resistance to the flow of cold air will cause the largest bulk of air to be forced along and against the walls which otherwise would be deflected more or less by the warm air. By this method the bottom of the case will be cooled from side to side thus resulting in a more uniform refrigeration throughout said case.

The several walls of the case including the bottom and top, though not so shown, preferably, of course, include insulating material in their construction arranged in any approved and well known manner and the various joints are properly protected in order to make an absolutely air tight job whereby to obtain the greatest economy in the use of refrigerating medium and hold the temperature down to the lowest possible point.

I may make slight changes in the construction of the device without departing from the intent and spirit of the invention and the scope of the accompanying claims.

Having thus described my invention, I claim:—

1. A refrigerating show case including in its construction a goods-containing space, and a partition spaced from each of two opposite ends of said case providing a compartment at each of two opposite walls, each adapted for containing a refrigerating medium, there being an opening in the upper portion of each said partition, and two series of imperforate conduits at the bottom of the case, each series communicating at one of their ends with the bottom of one of the compartments, the conduits overlying the entire bottom of the containing space between the side walls, the free ends of the two series extending in the direction of one another, their ends terminating opposite one another and separated by a space at substantially the middle of the distance between the described partitions.

2. A refrigerating show case including in its construction a goods-containing space, and a partition spaced from each of two opposite walls of the case to provide a compartment at each end thereof for containing a refrigerating medium, there being an opening in the upper portion of each said partition, and two series of imperforate con-

duits, each series communicating at one end with one of the compartments, the said two series of conduits extending in the direction of one another and separated by a space at substantially the middle of the length of the containing space, one of the conduits of each series near the medial longitudinal line of the containing-space being shorter than

the others and being also narrower than the others. 10

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

JOSEPH HELLER.

Witnesses:

W. S. McCLENATHAN,  
ORA THOMPSON.