No. 780,325. PATENTED JAN. 17, 1905.

F. B. DAVIDSON.

PAPER TRAY.

APPLICATION FILED MAR. 31, 1904.

2 SHEETS—SHEET 1.

Fig. 1

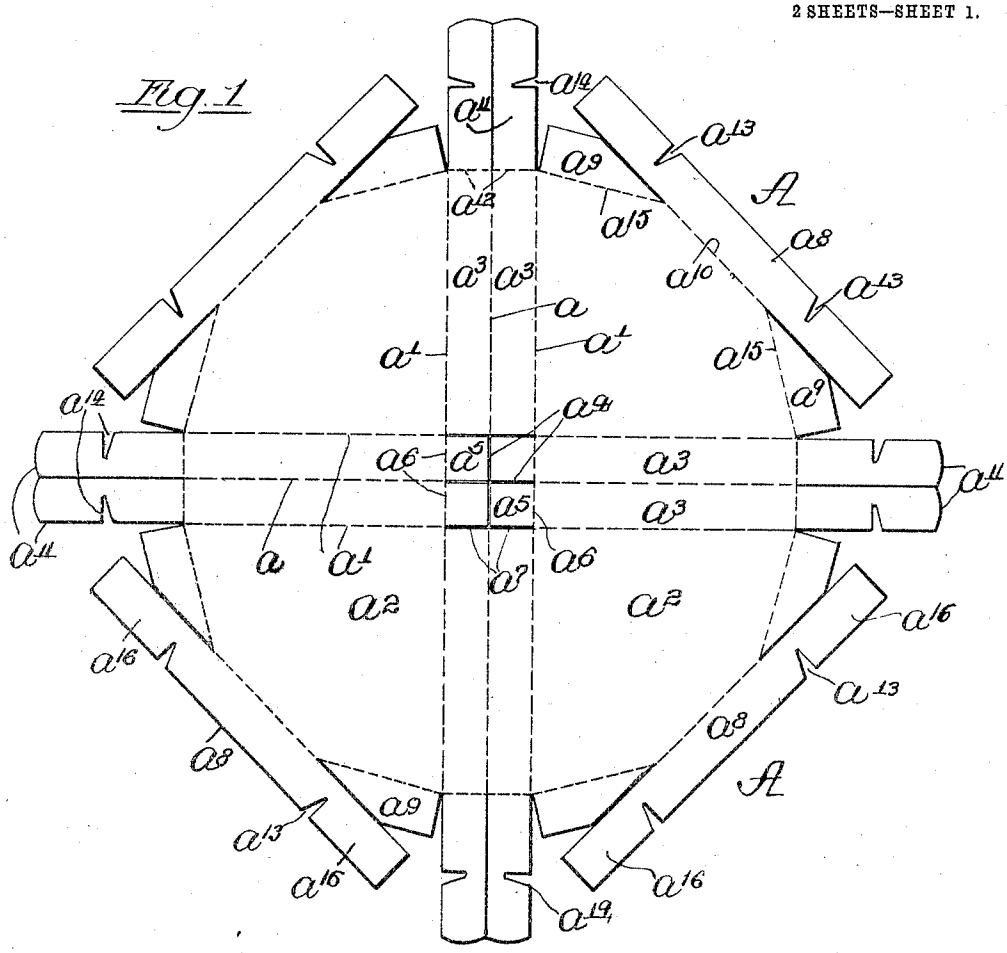
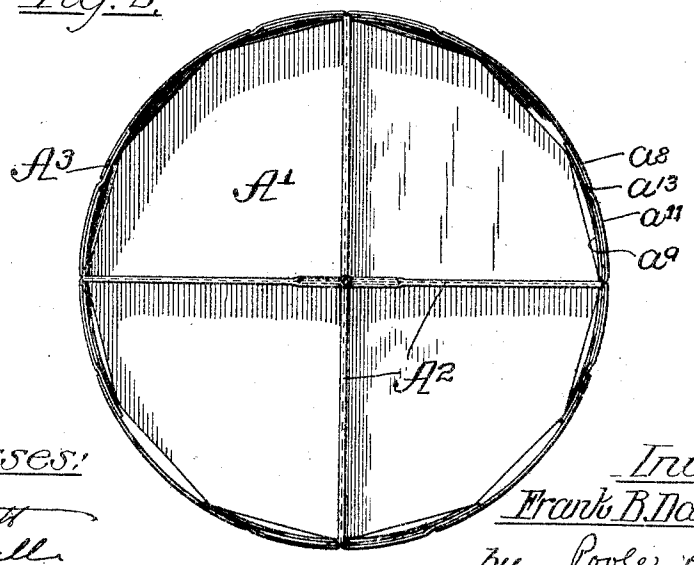


Fig. 2.



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2 SHEETS—SHEET 2.

Fig 3

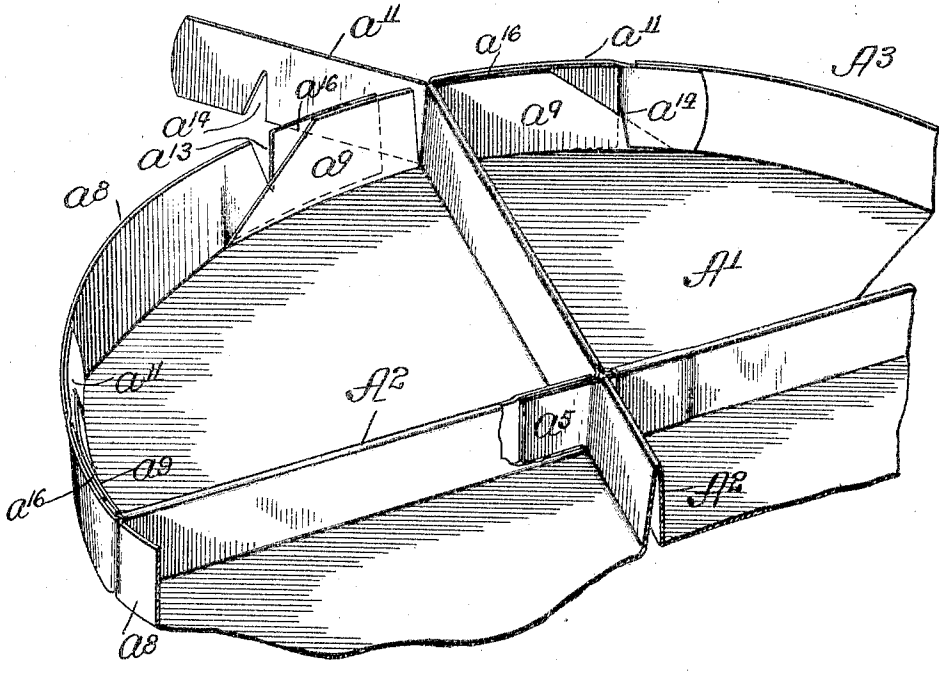


Fig 4.

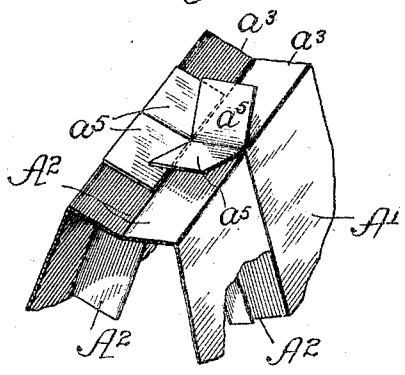
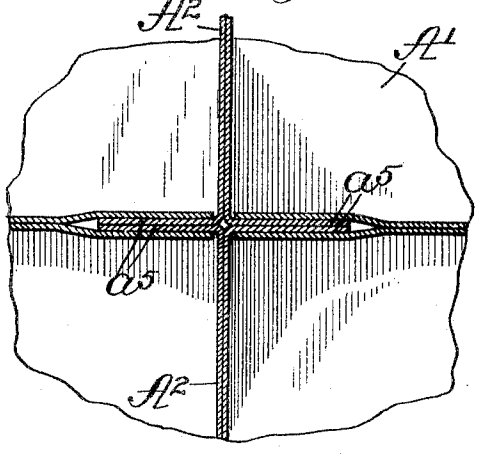


Fig 5



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No. 780,325. Patented January 17, 1905.

UNITED STATES PATENT OFFICE.

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PAPER TRAY.

SPECIFICATION forming part of Letters Patent No. 780,325, dated January 17, 1905.

Application filed March 31, 1904. Serial No. 200,946.

To all whom it may concern:

Be it known that I, FRANK B. DAVIDSON, a citizen of the United States, and a resident of Marseilles, in the county of Lasalle and State of Illinois, have invented certain new and useful Improvements in Paper Trays; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in trays or other like receptacles or articles made of paper or other flexible sheet material and provided with a flat bottom and a rim surrounding said bottom and provided also with radial partitions extending inwardly from the rim to the center of the bottom of the tray and so constructed as to be capable of being folded flat for storage and shipment. The invention relates also to a blank from which such article is made.

The device herein illustrated is especially applicable for use as a tray for packing in pails candies and like merchandise, and when used in this manner the trays are filled and placed in a candy-pail one over the other, said trays thus serving as horizontal separators or partitions by which the layers of candy in the pail are separately supported, the lower trays supporting those above the same. A device having the same features of construction may, however, be used for other purposes.

As shown in the drawings, Figure 1 is a plan view of a cut and scored blank from which my improved tray is formed. Fig. 2 is a top plan view of the finished tray. Fig. 3 is an enlarged fragmentary perspective view of the tray, showing the same in a partially set-up condition. Fig. 4 is an enlarged perspective view of the central part of the tray when partially set up, showing the manner of interlocking the inner ends of the partitions. Fig. 5 is a horizontal section of the parts shown in Fig. 4 after the same have been set up.

As shown in said drawings, A, Fig. 1, designates a blank in flat form from which my improved tray is made. The blank is divided into four symmetrically-arranged generally sector-shaped parts a^2 by two sets of score-lines $a\,a'$, each set embracing three parallel lines. The lines of one set intersect the lines of the other set at the center of the blank, and the sector-shaped parts a^2 are located in the four angles of the intersecting sets of score-lines and constitute in the complete or set-up tray the end or bottom wall A′ of the tray. Between the center score-line a and the side score-lines a' of each set, at each side of the center of the blank, are formed rectangular partition-sections a^3, which are adapted to be folded upwardly from the blank at right angles to the latter to constitute the partitions A^2, there being four pairs of partition-sections. The rectangular space surrounded by the outer score-lines a' at the center of the blank is divided by two right-angled intersecting cuts or lines of severance a^4 into four rectangular tabs $a^5\,a^5$, which are joined to or made continuous with two opposite pairs of partition-sections a^3 and are divided from the other partition-sections by lines of severance a^7. Said tabs are separated from the sections $a^3\,a^3$, with which they are connected by score-lines $a^6\,a^6$, which extend across the bases of the tabs. Each of the four sector-shaped sections a^2, located between the sets of score-lines, is provided at its outer margin with three folding flaps $a^8\,a^9\,a^9$, which are divided from the said parts of the blank by score-lines $a^{10}\,a^{15}\,a^{15}$. Said flaps $a^8\,a^9$ are adapted to be folded upwardly at right angles to the body of the blank to constitute the rim of the tray, which is designated as a whole by the reference-letter A^3 in Figs. 2 and 3. The flaps a^8 are formed in the central part of the sections a^2 between the flaps $a^9\,a^9$, and said flaps a^8 are provided with endwise extensions a^{16} a^{16}, which when the blank is flat project tangentially from the margin of the blank outside of the shorter exterior flaps $a^9\,a^9$. The partition-sections a^3 are provided with folding extensions or flaps $a^{11}\,a^{11}$, which extend from the ends of the sections beyond the margins of the main parts a^2 of the blank and are divided from the partition-sections by trans-

verse score-lines a^{12} to facilitate the lateral folding of said flaps or extensions when the tray is set up, as will be hereinafter described. The extensions a^{16} a^{16} of the central rim folding flaps a^8 are provided with outwardly-opening notches a^{13}, and the partition-section flaps a^{11} are provided with like notches a^{14}, adapted to engage the notches a^{13} when the tray is set up to lock the parts of the rim together.

When a tray is to be set up or formed from a blank cut and scored in the manner shown in Fig. 1, the partition-sections a^3 at each side of the center of the blank are folded upwardly from the body of the blank and are brought flatwise together, as shown in Figs. 3 and 5, thereby forming partitions A^2 of double thickness, the partition-sections of each pair at each side of the center of the blank being folded into contact with each other along the central score-lines a and the two sections of each pair being folded upwardly from the blank at right angles to the latter along the outer score-lines a'. When the blank is set up, each tab a^5 is bent outwardly at right angles to the partition-sections to which it is attached and rests in the fold of the partition-section at right angles thereto, the pair of tabs on the partition-sections which are in line with each other thus being brought together between the folded sections of the intersecting partitions. The folding of the parts in the manner described may be easily effected by first folding together the partition-sections to which the tabs are attached and at the same time folding them upwardly into position at right angles to the bottom and then reversing the blank, or holding it bottom up, and flexing the two folded halves thereof on the score-lines a' a', so as to bring the other sections a^3 a^3, which are without tabs, at right angles to the body and at the same time bring the tabs a^5 a^5 on the opposite or inner sides of the last-named sections a^3 a^3, against which they may be folded, so that when the bottom is again flattened out the said tabs will rest in the folds of the partitions transverse to those which carry the tabs, as seen in Fig. 5. Their operation is shown in the perspective view Fig. 4, which shows the position of the parts after the sections provided with tabs have been folded against each other and the two sections a^3 a^3 without tabs then bent at right angles to the body of the blank, thus bringing the blank into a **U** shape. At this time the tabs a^5 a^5 will project past the inner or lower faces of the two sections a^3 a^3 which are without tabs, and said tabs are then folded outwardly or away from each other and into contact with the said sections a^3 a^3. After the parts have been thus folded if the blank is folded along the score-lines a', so as to bring the sections a^3 a^3 together and the two parts of the blank into the same plane, then the two pairs of tabs will be folded and confined within the folds of the partitions which is at right angles to that to which the tabs are attached, as clearly seen in Fig. 5.

It will be observed that while the partitions are being thus formed the sector-shaped sections a^2 of the blank, and which constitute the bottom A′ of the tray, are shifted radially inwardly to bring the points thereof together at the center of the tray, whereby the final or completed tray is of considerably less diameter than the blank. The spreading apart of the sections a^3 a^3 on which the tabs a^5 a^5 are formed is prevented so long as the tray is held flat by the contact of the upper edges of the tabs with the inner surfaces of the folds of the partitions which embrace the tabs, it being obvious that the said sections a^3 a^3 cannot be spread apart at their lower edges without throwing upwardly the free ends of the tabs so confined in the folds of the partitions. It will also be seen that the sections a^3 a^3 of the partitions which embrace the tabs cannot be spread apart because the tabs a^5 a^5 are held together at their upper edges by the said partitions which embrace them, and as said tabs are at right angles with the partitions to which they are attached the latter partitions cannot be moved endwise away from each other in a manner to spread apart the other partitions without tearing or rupturing the said tabs.

After the partitions have been formed the rim is formed as follows: In forming the rim the flaps a^8 a^9 are folded upwardly at right angles to the end wall of the tray, and preferably the short flaps a^9 are folded upwardly first and thereafter the longer flaps a^8 are folded upwardly, with the end portions a^{16} a^{16} thereof overlapping and fitting the outer faces of said short flaps a^9, as more clearly shown in Fig. 3. Thereafter the flaps a^{11} of the partition-sections are folded laterally against the outer faces of the ends a^{16} of the longer rim-flaps a^8, and the notches a^{14} of said partition-section flaps are engaged with the notches a^{13} of the rim-flaps, as clearly shown in Fig. 3. At the places where the notches a^{13} occur in the formed rim said notches are located over the oblique margins of the flaps a^9, so that the notches a^{14} of the partition-section flaps engage not only the notched parts of the flaps a^8, but also the oblique ends of the flaps a^9, thereby not only locking the partitions to the rim, but binding the flaps or sections of the rim together. The partition-section flaps thus constitute themselves parts of the rim. The partition-sections are thus interlocked with the rim at their outer ends and with each other at their inner ends. The particular formation of the flaps from which the rim is formed may be varied; but inasmuch as the arrangement herein shown produces a continuous and strong rim the arrangement shown is hereinafter made the subject of specific claims. Moreover, the form of the tabs a^5 may be varied somewhat so long as is preserved the interlocking function described.

By reason of the construction described I am enabled to produce a tray of ample strength with comparatively light-gage stock. The trays thus formed are capable of being shipped and stored in flat form, thereby greatly economizing the space necessary for shipping and storing the same, and are capable of being readily set up for use.

I claim as my invention—

1. A tray provided with a plurality of radial partitions, each formed by folding upwardly from the bottom wall thereof into contact with each other two parallel, radial partition-sections, the sections of two of the partitions being provided with tabs which extend between the folded sections of two other partitions.

2. A tray provided with a plurality of radial partitions, each formed by folding upwardly from the bottom wall thereof into contact with each other two parallel, radial partition-sections, the sections of two of the partitions being provided with tabs which extend between the folded sections of the other partitions, a rim surrounding the said bottom and interlocking connections between said rim and the outer ends of the partitions.

3. A tray comprising a flat bottom wall, a surrounding rim and a plurality of radial partitions which are integral with and folded upwardly from the bottom wall, said partitions having interlocking connection with each other at their inner ends, and flaps at the outer ends of said partitions which extend outwardly beyond and have interlocking connection with said rim.

4. A tray made of a single piece of sheet material, comprising a flat bottom wall, a plurality of radial partitions integral with and folded upwardly from the said bottom wall, said partitions being interlocked at their inner ends with each other, a rim surrounding said tray and consisting of a plurality of upwardly-folded flaps, and flaps extending endwise from said partitions and outwardly beyond, and having interlocking connection with, the flaps of said rim.

5. A tray comprising a flat bottom wall, a surrounding rim and a plurality of radial partitions, each partition being formed by folding upwardly from the said bottom wall into contact with each other two parallel, radial, partition-sections, said partition-sections being provided at their outer ends with flaps which extend endwise from the sections outwardly beyond, and are adapted for interlocking connection with, the rim.

6. A tray comprising a bottom wall, a surrounding rim, and a plurality of partitions, each partition being formed by folding upwardly from the said bottom wall into contact with each other two parallel, radial partition-sections, the sections of certain of the partitions being provided with tabs which are adapted to extend between the sections of the other partitions, said partition-sections being provided at their outer ends with flaps which extend endwise from the sections and are adapted for interlocking connection with said rim.

7. A blank for a tray provided with a plurality of sets of score-lines which intersect each other centrally of the blank, each set comprising three parallel score-lines, the central part of the blank between the outer intersecting score-lines being divided to constitute four flaps which are connected with the two opposite pairs of partition-sections.

8. A blank for a tray provided with rim-flaps and with a plurality of sets of score-lines intersecting each other centrally of the blank, each set comprising three score-lines between which are formed partition-sections and locking-flaps extending endwise from said partition-sections beyond the rim-flaps.

9. A blank for a tray provided with rim-flaps and with a plurality of sets of score-lines which intersect each other centrally of the blank, each set comprising three parallel score-lines, and the central part of the tray between the outer intersecting score-lines being divided to constitute four flaps which are connected with the two opposite pairs of partition-sections, said partition-sections being provided at their outer ends with flaps extending endwise from the sections beyond the rim-flaps.

10. A blank for a tray divided into a plurality of symmetrically-arranged parts a^2 by score-lines $a\ a'$ which intersect each other at the center of the blank and between which are formed the partition-sections a^3, rim-flaps $a^8\ a^9$ at the margin of the parts a^2 having the notches a^{13}, certain of the partition-sections being provided at their inner ends with the tabs a^5 and the partition-sections being provided at their outer ends with flaps a^{11} furnished with notches a^{14}.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 21st day of March, 1904.

FRANK B. DAVIDSON.

Witnesses:
TAYLOR E. BROWN,
GERTRUDE BRYCE.