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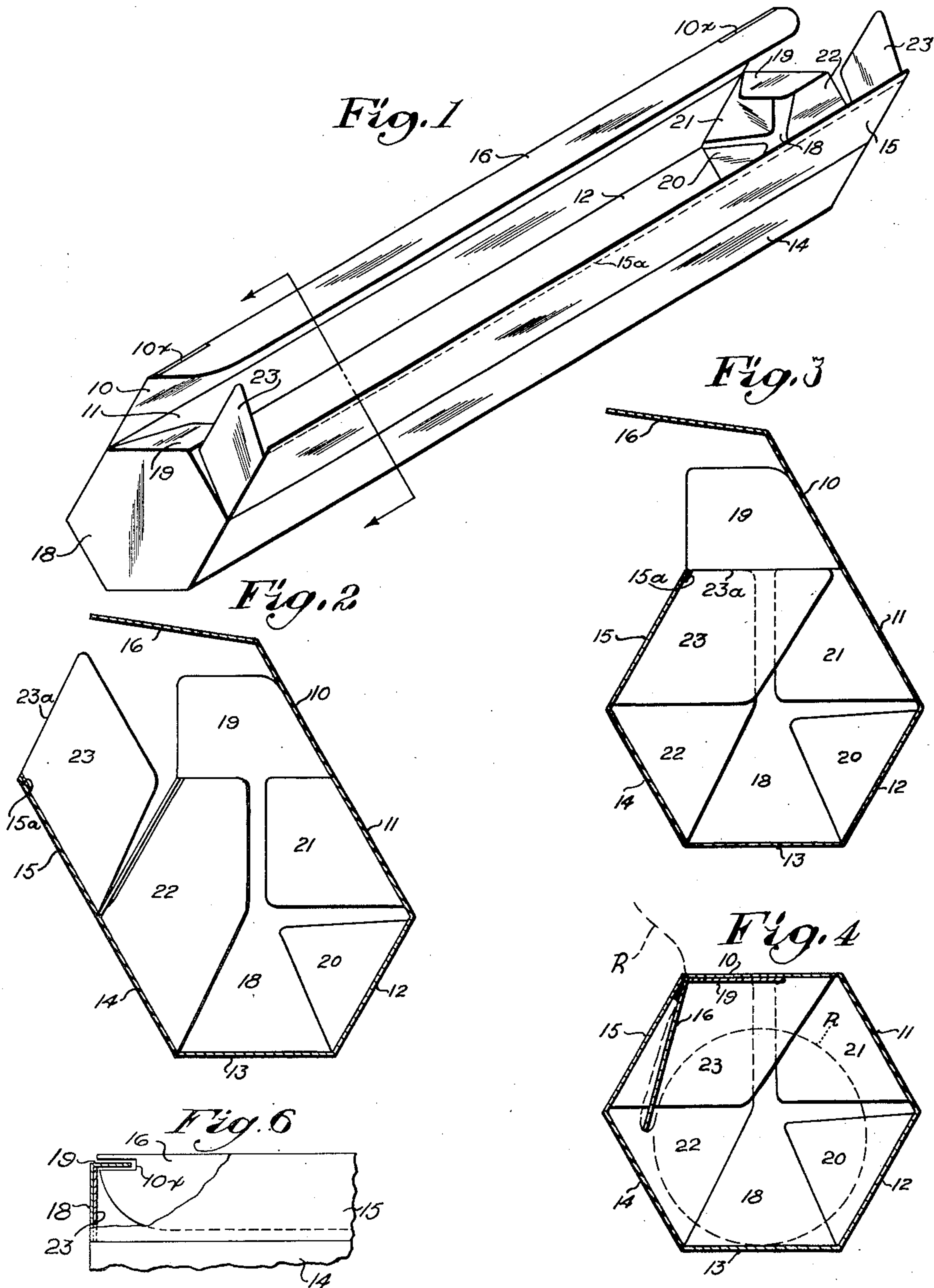
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2,659,525

POLYGONAL BOX

Filed Feb. 17, 1949

2 Sheets-Sheet 1



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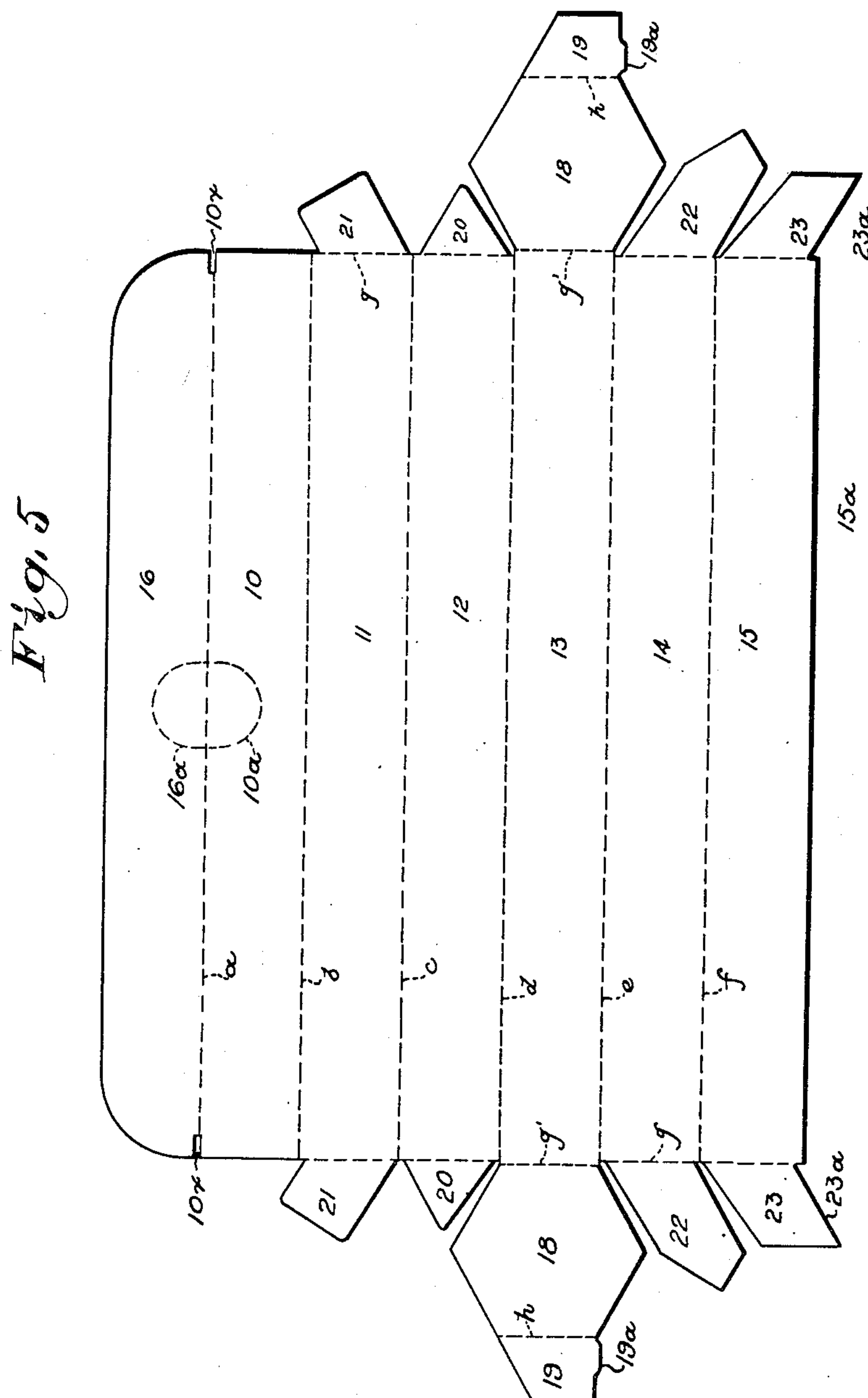
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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POLYGONAL BOX

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Application February 17, 1949, Serial No. 76,998

1 Claim. (Cl. 229—33)

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This invention relates to folding boxes or cartons of foldable sheet material such as paperboard and which are formed from integral blanks. More particularly it aims to provide a polygonal device of the class described for use as a dispensing holder or package especially for rolls of waxed or other paper, foil and the like sheets, and to provide a one-piece blank for such polygonal and particularly hexagonal box peculiarly adapted for setting up on machines as known under the trade-mark "Brightwood."

In the drawings illustrating by way of example one embodiment of the invention:

Fig. 1 is a perspective view of a dispensing box of the invention in set-up but open condition;

Figs. 2, 3 and 4 are sectional views on a transverse plane and looking toward the inner face of one end of the set-up box as indicated by the section line on Fig. 1, showing the same in successive stages of closure;

Fig. 5 shows a blank for the box; and

Fig. 6 is an enlarged detail of an upper corner portion of the closed box; as at the left in Fig. 1.

Referring now to the drawings in more detail and first to Fig. 5, the one-piece paperboard or like blank as there shown is generally rectangular and comprises a series of integrally united longitudinal side panels appropriate in number for the formation of the body of a polygonal box, herein illustrated as hexagonal. While as to some aspects of the invention the box may be provided with a greater or lesser number of sides than six the construction and arrangement as illustrated is especially adapted to multi-polygonal forms wherein a loosely inserted sheet roll such as R, Fig. 4, will have at the lower portion thereof at least three longitudinal walls in approximate tangential relation to it.

The several side panels of the box blank will for convenience be identified with reference to their position in the set-up box. They include a top side or hinged cover member 10, an upper back side 11, a lower back side 12, a bottom side or floor 13, a lower front side 14 and an upper front side 15 which herein also constitutes a hinged cover member. These longitudinal panels, numbered in the order from top to bottom in Fig. 5, are demarked by longitudinal and herein parallel scored or other fold lines *a*, *b*, *c*, *d*, *e*, and *f* respectively between each two adjacent panels and upon which the blank is foldable in setting up the box. The score line *a* along the outer edge of the top side 10 constitutes a hinge line between the latter and a longitudinal tuck flap 16 carried by said top side and defining one longitudinal margin of the blank.

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The top side or cover panel 10 and the tuck flap 16 thereof have free edges at the opposite ends. The side panels 11—15 each have end extensions, to be referred to, the panels proper being demarked at the ends by scoring or other fold lines *g* in line with the free end edges of the top cover 10 except at the ends of the bottom panel 13 which are preferably offset as at *g'* by approximately the thickness of the sheet material of the blank.

The blank further includes integral end walls or panels 18 at the respective ends of one of the longitudinal panels, herein the bottom 13. The end panels 18 are shaped and proportioned to conform to and to close the ends of the tubular box body provided by the side panels 10—15 in the set-up state. As shown said end panels 18 are polygons with as many side edges as there are sides for the box. In the illustrated six-sided example they are hexagonal. In a dispensing roll holder with which the invention is mainly but not exclusively concerned the box sides preferably are of equal width or substantially so. The end panels 18 accordingly are shown as equilateral hexagons.

The blank is further formed to provide dust flaps 19 on the end panels 18. These are shown as quadrilateral extensions opposite the bottom-connected sides *g'* of the end panels and demarked from them by score lines *h*. These dust flaps 19 each have a longitudinal edge with lateral projection 19*a* substantially in line with the front hinge line *e* of the bottom panel 13. In the set-up closed box the dust flaps 19 are turned in and lie closely parallel to the top cover 10, Fig. 4, with the front edges 19*a* received in the interior angle between said top cover 10 and the tuck flap 16 thereof. For convenience in closure the sides of the dust flaps opposite the front edges 19*a* are inclined toward the latter and the outer end edges substantially parallel the hinges *h*, giving the dust flaps herein a trapezoidal shape.

Referring again to Fig. 5 and the blank thereof, a plurality of the side panels, herein the lower back panel 12, the upper back panel 11 and the lower front panel 14, have extensions at both ends of the blank there providing glue flaps 20, 21 and 22. These are so shaped and proportioned that together they present a total area approaching that of the corresponding end panel 18.

In setting up the box the glue flaps 20—22 at each end are turned into a common transverse plane so as to be received flatwise against the inner face of the corresponding end panel 18, of which they overlap substantially more than half the area. In the illustrated example the

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total glue flap area is approximately $\frac{5}{6}$ of each hexagonal end panel. As seen in Fig. 2 the described glue flaps 20, 21, 22 overlap substantially the entire upper half of the adjacent end panel 18 and considerably more than one-half of the lower half of the latter, approximately $\frac{2}{3}$ of such lower half in the illustrated instance.

This is accomplished by forming the several glue flaps as sectors and combinations of sectors and half-sectors of the hexagonal end walls 18. In the illustrated example the glue flap 20 on the lower back panel 12 is of substantially equilateral triangular form, equivalent in area to one one-sixth sector of the end walls. The adjacent glue flap 21 on the upper back panel 11 is a trapezoidal quadrilateral of approximately $1\frac{1}{2}$ times the area of glue flap 20, that is, equivalent to one and one-half end wall sectors. The glue flap 22 on the lower front panel 14 is of pentagonal form with an area equalling that of the glue flaps 20 and 21 together, equivalent to two and one-half end wall sectors. Accordingly the three glue flaps 20, 21 and 22 will together overlap the entirety of the corresponding end panel 18 save for the sector immediately adjacent the hinged bottom edge g' thereof. At that region adequate strength and rigidity is inherent from the integral relation of the end panels to the blank as a whole.

The described end panels 18 and the several glue flaps 20, 21, 22 occupy the opposite end edges of the bottom panel 13, the lower back and front panels 12 and 14 and the upper back panel 11. In the set-up and secured position with the glue flaps adhesively or otherwise secured in face contact at the inner faces of the end panels 18 said four longitudinal panels 11 to 14 are held in relatively fixed non-opening relation.

Among the advantages for the hexagonal side-opening box of the invention is the capacity to be handled in commercial box machines such as those of the "Brightwood" type. This is largely by reason of the fact that the glue flaps 21, 22, 22 at the respective sides of the blank are in line and accordingly may readily have glue applied to them during travel through the machine in the direction perpendicular to the side panels, that is, from top to bottom or the reverse as viewing the blank in Fig. 5. If the face of the blank as seen in Fig. 5 is regarded as the inside it will be understood that the glue is applied upon the underface of the glue flaps 20—22 as the blanks pass through the gluing mechanism of the "Brightwood" machine.

As previously noted the hinged top panel 10 and its tuck flap 16 define one longitudinal margin of the blank and are free of end projections. The opposite longitudinal side of the blank is defined by the upper front side and cover panel 15. This is hingedly connected at the score line f along the adjacent side of the lower front panel 14. The respective end edges of this front upper side cover element 15 are each formed with a herein quadrilateral tuck tab 23 hinged along the score or fold line g and projecting longitudinally and angularly. The outer longitudinal edges 23a of these tuck tabs are disposed at such angle to the free longitudinal margin 15a of the openable upper front panel 15 on which they are carried that in the set-up and closed condition, as seen in Figs. 3 and 4, the tab edge 23a will coincide with the plane of the openable top 10.

The tuck tabs 23 of the upper front panel 15 are non-glued, contrasting in this respect to the glue flaps 20, 21, 22 and are free to contribute

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to an interlocking relation of the parts in the completely closed position of the box, Fig. 4. Thus the upper front side panel 15 is constituted as an openable folding hinge cover element equally with the cooperating openable top cover element 10 at the opposite longitudinal side of the blank. It will be understood that the terms such as "top," "bottom," "upper" and "lower" are herein used for identification and without necessary limitation as to the use position of the dispenser box. The six panels 10 to 15 all constitute longitudinal side walls for the box, and the two terminal side walls 10 and 15 at the opposite longitudinal margins of the blank, adapted to meet along their opposed longitudinal side edges when the box is closed, together constitute openable side wall means having oppositely hinging portions connected to respectively adjacent fixed side walls 11 and 14. Thus the box is readily openable to receive a roll R which may initially have a diameter greater than the width of any one of the side walls of the box. In Fig. 4 the content roll R shown dotted is assumed as having been partly dispensed and hence of somewhat less-than-capacity diameter.

As seen in Fig. 5, also Figs. 1 and 6, cover locking formations or notches 10x are formed at the opposite ends of the openable top cover panel 10, extending in from the respective end edges and in line with the scored hinge line a for the tuck flap 16. In the fully closed condition, noting particularly Fig. 6, these locking notches 10x are adapted to receive the described locking projections 19a on the adjacent longitudinal edges of the flaps 19, thus affording a positive interlock for retaining both hinged cover portions 10 and 15 closed.

Assuming the blank to have been glued, folded and set up to the completed form of Figs. 1 to 4, with the four side walls 11 to 14 secured adhesively or otherwise by flatwise attachment of the glue flaps 20—22 against the adjacent end panels 18, the content roll R of wax paper or other sheet in roll form is inserted, the box being open as in Figs. 1 and 2. The free tuck tabs 23 are turned in and the openable front side cover 15 is swung inwardly to the position as in Fig. 3. The dust flaps 19 carried by the secured end panels 18 are bent in over the adjacent ends of the roll. The other or top openable cover 10 is closed down with its tuck flap 16 inserted inside the free longitudinal edge of the front cover member 15; Fig. 4. As the cover members are brought to full closed position the locking notches 10x come opposite the adjacent longitudinal edges 19a of the dust flaps 19 allowing the latter to spring laterally or forwardly out into the locking notches, positively locking the parts in closed position. The tuck tabs 23 cooperate in this closing and locking function, limiting down movement of the top cover 10 and aiding in providing rigidity and a tight closure for the several interrelated hinged closure elements.

The described construction further facilitates the dispensing of the contained supply roll R as will be apparent by reference to Fig. 4. There the leading edge of the overwound roll R is indicated as turned upwardly around the free edge of the tuck flap 16 and extending outwardly in the crevice between the two closed and locked front and top cover panels 10 and 15. The free edge of the front panel 15 may be constructed or treated to serve as a cutting edge, serrated or otherwise, as by impregnation with stiffening

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material or by attachment of a metal or other cutting edge. To facilitate access to the leading edge of the sheet or strip material of the roll without opening of the box the top cover 10 and tuck flap 15 may be formed with one or more cut-scored areas or aperture-forming portions 10a, 16a, Figs. 1 and 5, for access by the thumb and forefinger of the user.

My invention is not limited to the particular embodiment thereof illustrated and described herein, and I set forth its scope in my following claim.

I claim:

In a folded paperboard box for use in a dispensing package for sheet rolls, an elongate tubular hexagonal body for use in horizontal position, comprising an elongate rectangular horizontal bottom wall, lower front and lower back side walls continuously along and integral with the respective horizontal longitudinal edges of the bottom wall, an upper back side wall coextensively along and integral with the lower back side wall, glue flap extensions hinged at the opposite ends of each of said lower front, lower back and upper back side walls and infolded at right angles thereto, the bottom wall having extensions at each end by an amount equal to the thickness of said side wall glue flap extensions and having integrally formed across each of said end extensions an hexagonal vertical end wall turned flatwise against and adhesively secured to said side wall glue flap extensions in fixed relation thereto permanently closing the ends of said tubular hexagonal body, said hexagonal vertical end walls having at the transverse edges opposite the respective bottom wall extensions infolded quadrilateral dust flaps each with a longitudinal edge portion having a lateral projection

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positioned to intersect the vertical plane containing the bottom wall front longitudinal edge, a pair of hinged openable non-sealed adhesive-free elongate rectangular top and upper front side closure walls coextensive with the mentioned side walls and hinged along opposite longitudinal edges to the upper longitudinal edges respectively of the upper back side wall and the lower front side wall and hingingly closeable toward each other into longitudinal juncture respectively in horizontal and in inclined planes completing the closure of said tubular hexagonal body, said hinged top closure wall carrying an adhesive-free longitudinal tuck flap, said hinged upper front side wall having at each end a transverse tuck tab receivable in closed position along the inner face of the adjacent end wall and with the upper longitudinal edge of each said tuck tab abutively underlying the closed hinged top wall, and longitudinal locking recesses at the ends of the top wall longitudinal tuck flap engageable respectively with the aforementioned projections of the longitudinal edge portion of the dust flap of the adjacent hexagonal end wall thereby to retain both the hinged closure walls in closed position.

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