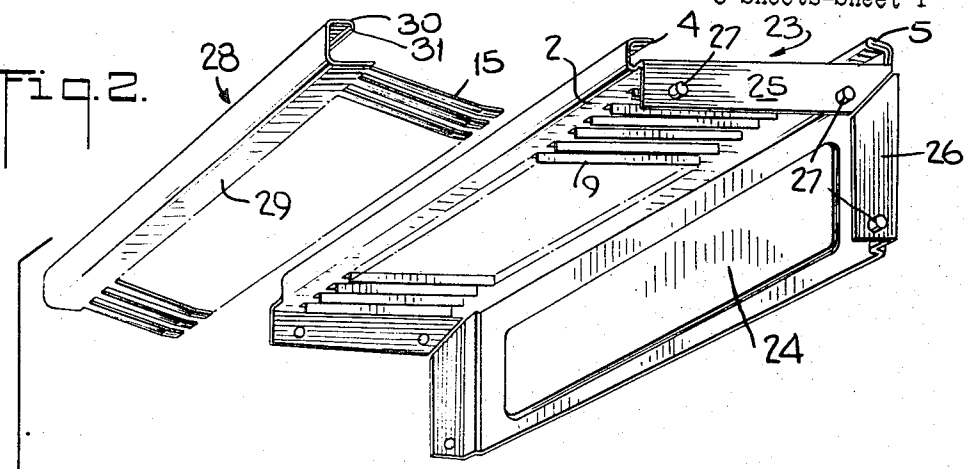
Dec. 17, 1968 K. D. SCHWEERS 3,416,250

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Fig. 2.



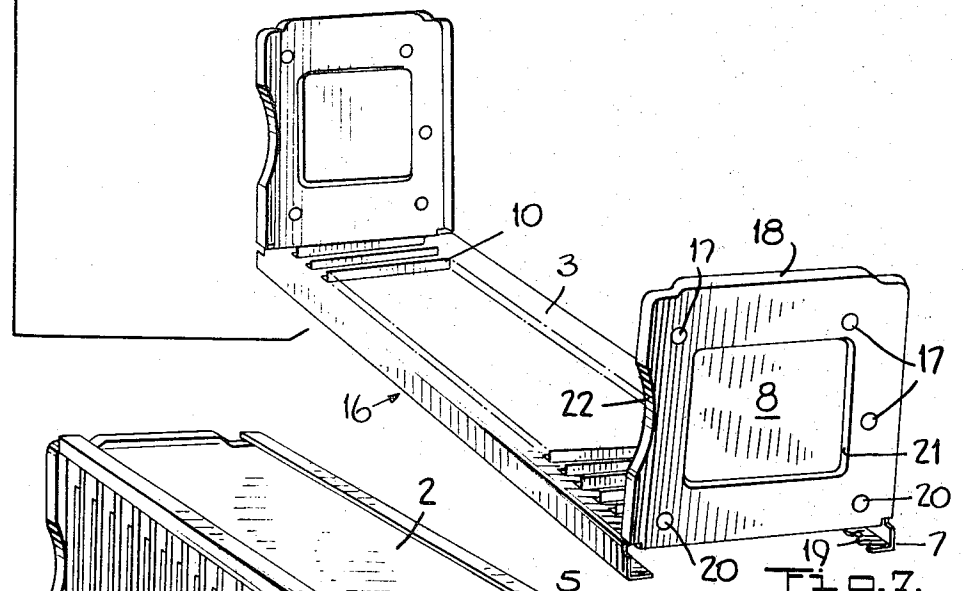
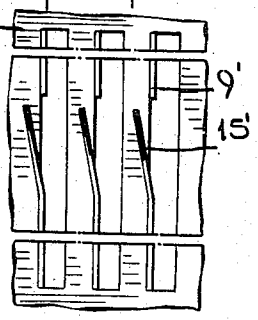


Fig. 7.



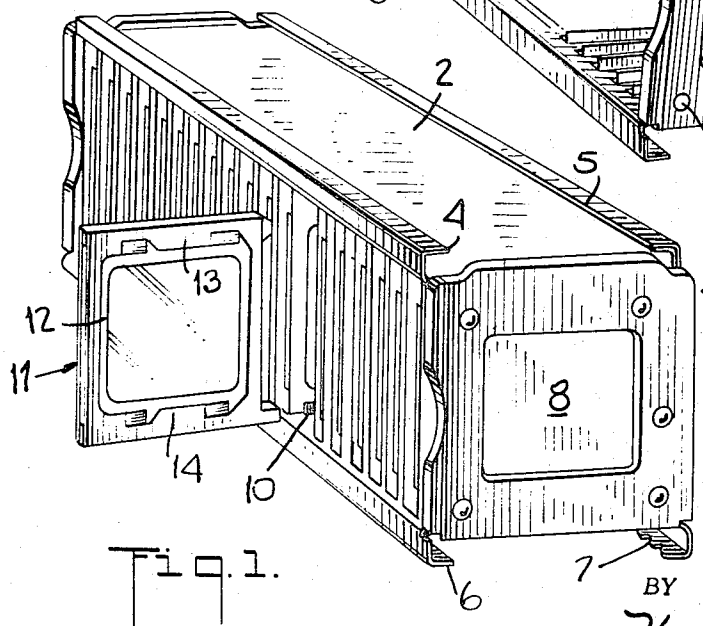


Fig. 1.

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Fig. 4.

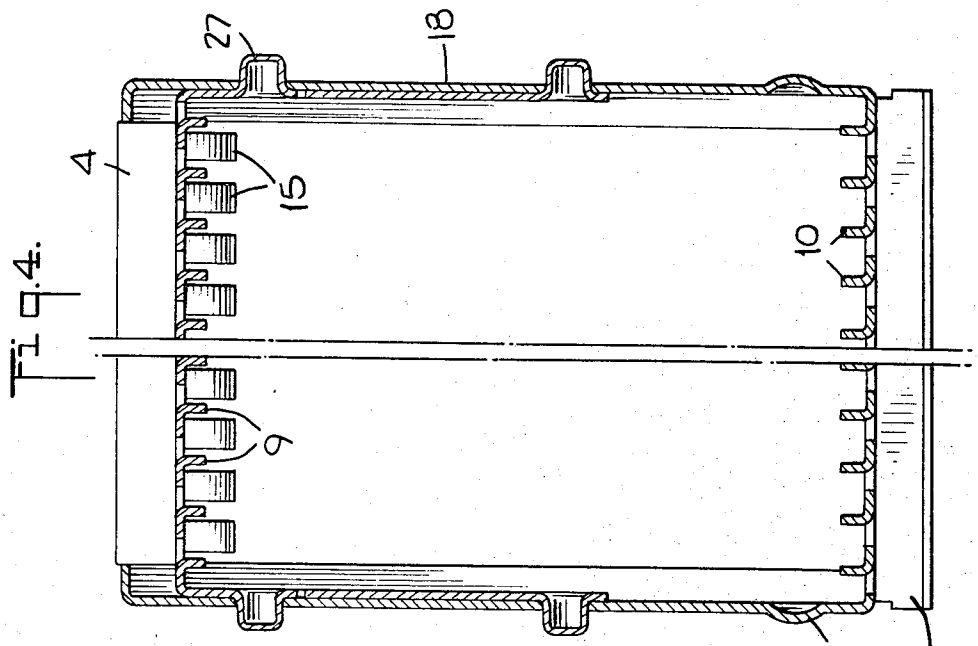
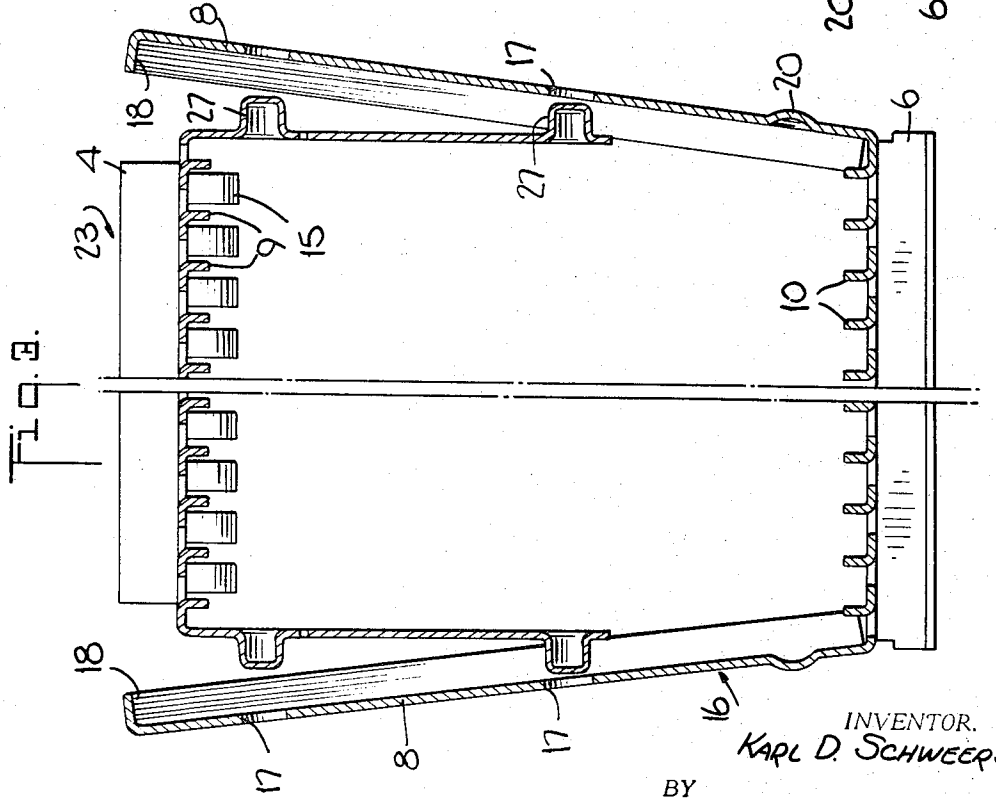


Fig. 3.



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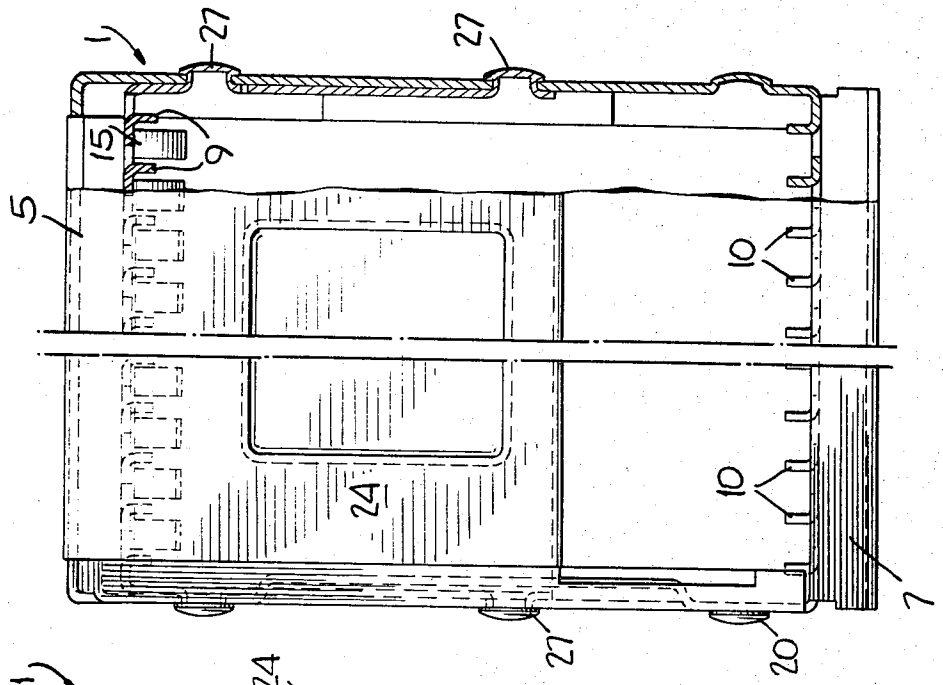


Fig. 5.

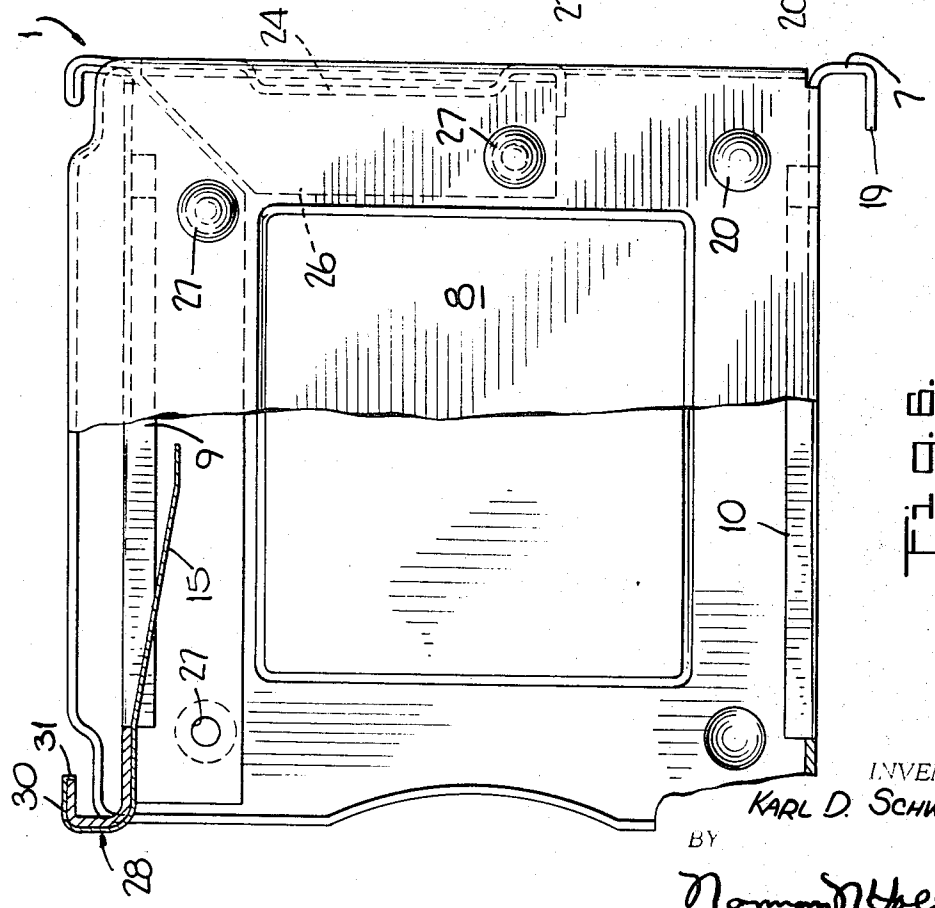


Fig. 6.

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METAL SLIDE MAGAZINE

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Filed Mar. 23, 1966, Ser. No. 536,910
3 Claims. (Cl. 40—79)

ABSTRACT OF THE DISCLOSURE

A metal magazine for storing and exhibiting photographic slides formed of two principal portions including a top member having an integral depending side plate and depending end flanges and a bottom member having integral upstanding end plates which cooperate with and are fastened to the end flanges of the top member. Slide accommodating channels are formed in the magazine by inwardly bent tabs formed by transversely slotting of the top and bottom members. Slide retaining means are formed by cutting the bent tab members transversely and longitudinally to form yieldable spring fingers which are bent into the channels between the tab members.

The present invention relates to an improved tray or magazine for storing and exhibiting transparent slides such as, for example, the well-known 35 mm. transparencies mounted in cardboard and more particularly to an improved magazine of this type made of sheet metal.

Slide holding magazine formed of metal have been found to have desirable qualities not found in other types such as molded plastic trays which make the metal trays preferable in many instances for use in displaying and storing transparent slides. A particularly useful metal magazine design, for example, is shown in United States Patent No. 2,711,602 owned by the assignee of the present invention. A metal magazine of this general design is extremely compact and rigid and imprevious to moisture and temperature changes and thus provides a permanent and protective storage means which holds a maximum number of transparencies in minimum space.

While incorporating the above advantages and particularly the advantage of small overall size, metal magazines have heretofore been somewhat more difficult to manufacture than molded plastic trays with a corresponding storage capacity as it has been necessary to form the magazines from a relatively large number of metal parts riveted or otherwise fastened together. This not only required a large number of manufacturing steps but also required a somewhat complex assembly operation not well suited for automatic operation. It also provided a finished magazine whose relatively large number of individual parts presented additional opportunities for assembly error or damage during use.

The present invention provides a metal magazine including all the features and advantages of a metal magazine of a design such as the one referred to in the above mentioned patent and at the same time substantially reducing the number of parts so that, for example, a typical metal magazine may now be formed from only three parts where the minimum number of parts used in previous magazines amounted to a dozen or more. It will be clear from the following description that the simplified magazine substantially reduces the complexity of the parts

formation and assembly and also lends itself to ready assembly in its final form by a relatively simple automatic operation.

Accordingly, an object of the present invention is to provide an improved metal slide holding magazine.

Another object of the present invention is to provide a slide metal holding magazine having a minimum number of parts.

Another object of the present invention is to provide a metal magazine adapted for automatic assembly.

Another object of the present invention is to provide a more easily manufactured slide holding magazine.

Another object of the present invention is to provide a metal slide magazine of improved construction with improved wearing qualities.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawings, forming a part of the specification, wherein:

FIG. 1 is a perspective view of the completed magazine illustrating individual slide holders in the magazine compartments;

FIG. 2 is an exploded perspective view showing the three sections of the magazine;

FIGS. 3 and 4 are vertical sectional views partially cut away of a magazine illustrating successive steps in the magazine assembly;

FIG. 5 is a rear elevational view of the assembled magazine partially cut away;

FIG. 6 is a vertical end view partially in section of the assembled magazine; and

FIG. 7 is a fragmentary bottom plan view of the top portion of an alternate embodiment.

FIGS. 1 and 6 illustrate an assembled metal magazine in accordance with the present invention. The magazine **1** includes a rigid top **2** and a bottom **3** having inturned channel-like edge portions **4–7**. The top **2** and bottom **3** extend between end plates **8**. This box-like structure is provided with a series of slide receiving compartments defined by opposing upper and lower partition members **9** and **10** best illustrated in FIGS. 2 and 5 which receive the upper and lower portions of individual slide holders **11** (FIG. 1).

These slide holders **11** preferably are metal frames as illustrated in FIG. 1 with a frame-like center portion **12** and upper and lower slide transparency receiving channels **13** and **14** which are proportioned to be slidably received between the upper and lower partition members **9** and **10**.

The slide holders **11** are resiliently held in position in the magazine compartments by spring fingers **15** extending into each compartment for lightly engaging each holder **11** to prevent its unintentional removal from the magazine **1**.

FIG. 2 illustrates preferred embodiments of the three units which form the entire magazine as described above.

A bottom unit **16** is formed from a plate or strip of metal such as aluminium which is cut and formed to the

shape illustrated in a series of stamping and forming steps.

The flat plates is first cut or blanked out to form a shaped blank including the bottom **3** and connected end plates **8**. Material for the channels **6** and **7** is provided on opposite sides of the bottom **3**. Sufficient border material is also provided on the end plates **8** for providing end flanges **18**. In the blanking out of the channel **7**, a series of teeth **19** are cut to form the magazine indexing rack for engaging an indexing gear on the projector.

The partition members **10** are also cut and bent by a suitable die either in the first blanking step or in later forming steps. Subsequent forming steps shape the flanges **18** on the end plates **8** and form the channels **6** and **7**. The bottom units **16** is ready for the magazine assembly when the end plates **8** are bent to their vertical position as illustrated in FIG. 2.

During the above formation of the end plates **8** of the bottom unit **16**, assembly holes **17**, false rivet heads **20**, end panels **21**, and other shaped portions such as cam clearance grooves **22** are cut and shaped. The grooves **22** permit the magazine to move past cams in the projector such as are used to fully return slide holders **11** to the magazine compartments.

The top unit **23** is blanked and formed by a similar series of manufacturing steps. A flat metal plate is blanked and formed to provide the top **2** with its channels **4** and **5** and an integral side plate **24** and end flanges **25** and **26**. As is clear from the illustration of channel **5** in FIG. 2, the channel **5** is formed from material provided between the top **2** and the side plate **24**. The partition members **9** are formed as well as three extruded rivets **27** which are outwardly directed from the end flanges (FIGS. 2 and 3) to engage the holes **17** in the bottom unit **16**.

Final forming steps shape the top unit to the generally L-shaped cross section as illustrated in FIG. 2 with the flanges **4** and **5** formed and with end flanges **25** and **26** bent into a common plane at right angles to the top **2** and the depending side plate **24**.

The third unit of the assembly comprises the leaf spring **28** having the individual spring fingers **15** connected by connecting portion **29** and also including a generally U-shaped flange **30** having an anchoring lip **31** for attaching the leaf spring **28** to the top **2** of the assembled magazine **1** as now will be described.

It will be seen that the above described bottom unit **16**, top unit **23** and leaf spring **28** include all the elements of the slide magazine with the exception of the individual slide holders **11** if they are used. The basic magazine **1** is therefore completed when these three units are assembled and fastened together. The assembly process is illustrated in and will be described with reference to FIGS. 3 through 6.

FIG. 3 shows the initial placement of the bottom unit **16** and the top unit **23**. These two units are easily placed in these relative positions in a suitable assembly device with the bottom units **16** and the top units **23** being fed intermittently to the assembly fixture by a suitable automatic feed device. After the top and bottom units **16** and **23** are arranged as shown in FIG. 3, these units are fastened together by pressing the end plates **8** inwardly so that the extruded rivets **27** pass through the associated holes **17** in the end plates **8**. This portion of the assembly operation is completed by flattening the rivets **27** into engagement with the outer surfaces of the end plates **8**. This provides a completed magazine frame with top **2**, bottom **3**, end plates **8** and side plate **24** firmly fastened together in a rugged magazine structure.

The magazine assembly is now completed by moving the leaf spring **28** into position adjacent the magazine top **2** with an individual spring finger **15** projecting into each slide receiving compartment. As described above, the leaf spring **28** has initially been shaped with the flange member **30** proportioned to surround and frictionally engage the corresponding flange **4** on the magazine top **2**. In attaching the leaf spring **28** on the flange **4**, the short anchoring lip **31** is preferably fully shaped to permit the leaf spring **28** to be snapped into place.

The cooperating flanges **4** and **5** and the top sections of the end flanges **18** provide an index card receiving frame as the upper portion of each of these flanges is slightly spaced from the magazine top **2**. As a final step in the magazine assembly, a suitable paper indexing card with or without a transparent protective film may be snapped into place beneath these flanges.

Another embodiment of the improved magazine is illustrated in FIG. 7. This embodiment provides a further reduction in the number of pieces required for a magazine of this type by including the spring means for holding the slide holders **11** in place in the magazine in the top or bottom units of the magazine. The spring fingers are provided in this case as an integral portion of the partition members **9** or **10** in the top **2** or bottom **3**. In the embodiment illustrated in FIG. 7, a spring **15'** is formed by a transverse and a longitudinal cut in the partition **9'** permitting a spring finger **15'** to be bent inwardly of the slide holding compartment to resiliently engage a slide holder **11**. It is clear that a magazine including this type of spring requires only two principal parts, i.e., a top unit and a bottom unit. A similar spring may also be formed in the bottom partitions **10** for use together with a spring **15'** in a top **2'** or a spring may be provided only on the bottom partitions **10**.

It will be seen that an improved and simplified magazine design has been provided for an efficient compact metal slide holding magazine. The improved design is particularly advantageous in its reduction of the number of separate parts required in the assembly of the magazine and also in the manner in which the parts are shaped so that the smaller number of parts and their convenient arrangement permits the magazine to be completely assembled in a few simple assembly steps. These steps are particularly well suited for an automatic magazine assembly operation in which suitable jigs align and assemble the portions of the magazine as the parts are fed from convenient stacks or unit supply hoppers.

The above advantages of simplified and easy assembly have been achieved in a metal magazine design which combines light weight, rugged structure, compact size, and pleasing appearance.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. A metal slide holding magazine comprising the combination of a one-piece top unit having a top portion and an integral side plate depending from one side of the top portion and end flanges depending from opposite ends of the top portion, said plate and flanges being at right angles to said top portion, a one-piece bottom unit having a bottom portion and integral end plates extending from opposite ends at right angles to said bottom portion, each of said units being provided with a plurality of transversely extending integral inwardly projecting members forming a plurality of spaces for receiving upper and lower portions of slides, each of said transversely extending members having a transverse cut and longitudinal cut forming from each of said members a yieldable spring finger extending inwardly into one of said spaces with its free end facing said integral side plate to resiliently engage a slide in said space.

2. A magazine as claimed in claim **1** in which one of said top and bottom units has projections thereon and the other has accommodating holes therein whereby the units are fastened together.

3. A magazine as claimed in claim 1 wherein the inwardly projecting members are tabs defined by transversely sloting said units.

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U.S. Cl. X.R.

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