C. H. TALLMADGE.

INDEXING AND ASSORTING MEANS.

APPLICATION FILED JULY 27, 1908.

1,150,793.

Patented Aug. 17, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

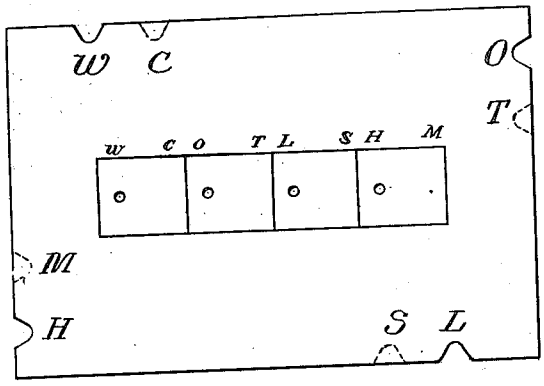


Fig. 2.

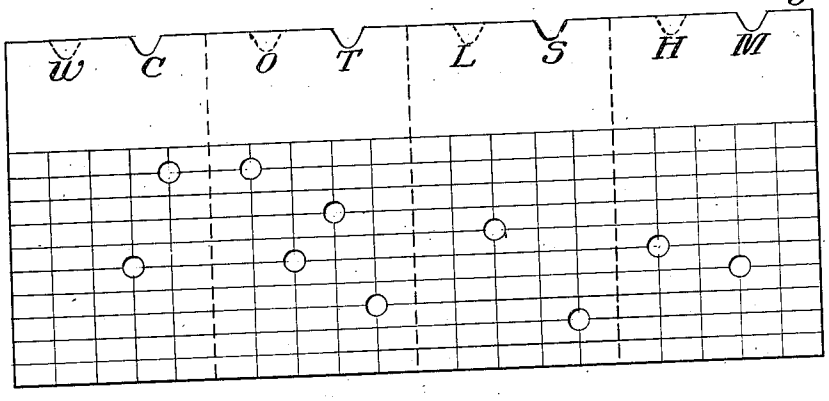


Fig. 3.



Fig. 4.

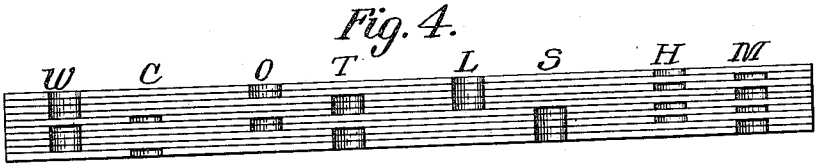
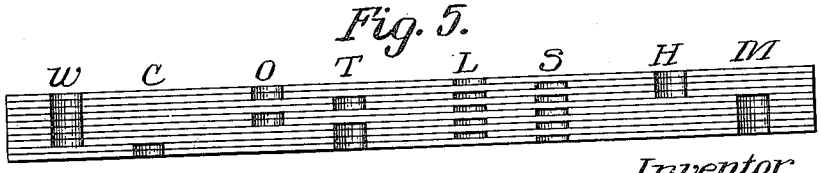


Fig. 5.



Witnesses:
John C. Michael.
Leonard W. Novander.

Inventor
Charles H. Tallmadge.
By Bruce Williams
Attorneys.

C. H. TALLMADGE.

INDEXING AND ASSORTING MEANS.

APPLICATION FILED JULY 27, 1908.

1,150,793.

Patented Aug. 17, 1915.

2 SHEETS—SHEET 2.

Fig. 6.

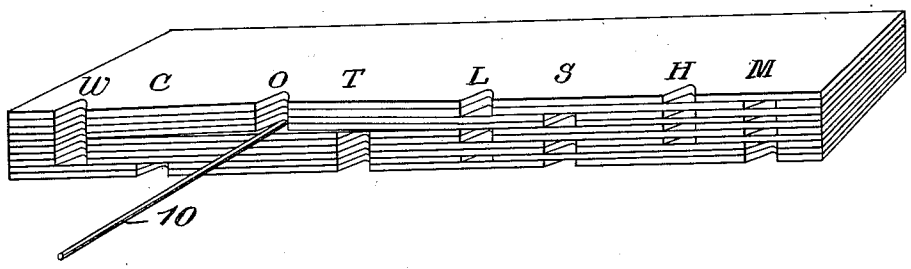
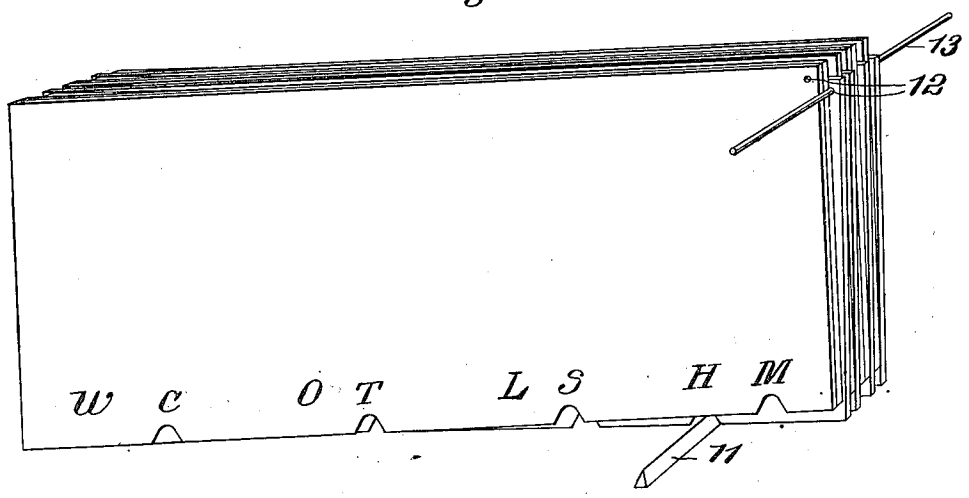


Fig. 7.



Witnesses:
John L. Michael.
Leonard W. Novander.

Inventor
Charles H. Tallmadge.
By Brown & Williams
Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES H. TALLMADGE, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO WILLIAM R. HEATH, OF BUFFALO, NEW YORK.

INDEXING AND ASSORTING MEANS.

1,150,793. Specification of Letters Patent. Patented Aug. 17, 1915.

Application filed July 27, 1908. Serial No. 445,652.

To all whom it may concern:

Be it known that I, CHARLES H. TALLMADGE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Indexing and Assorting Means, (Case 9,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to means for indexing and assorting cards or other sheets of like character. The indexing indicates upon each card the class or classes to which it belongs. The cards may be assorted by the aid of the same means as that employed for indexing purposes and the assorting can be done in accordance with my invention more expeditiously and economically than has been the case in the prior art so far as I am aware.

My invention affords exterior information of the classification and assortment of the cards after the assorting has been completed and all of the cards have been bunched or stacked together.

The method of perforating cards to indicate classification for the purpose of assisting in assorting or arranging them by classes which was used in the Census Office for the work of the last census may be taken as illustrating the best practice of the prior art. This device is so well known that I will not describe it at length, merely pointing out certain limitations for the purpose of indicating by way of contrast the advantages secured by my invention.

In accordance with the device of the prior art, the perforations being interior or distant from the edges of the cards are visible or otherwise available only in connection with the faces (or the backs) of the cards. In assorting the cards, therefore, if by machine, each card must be handled separately; if manually, using a needle, two or more cards of a given class may be handled together only in case they are on top and have similar perforations with no intervening card having dissimilar perforations. By similar and dissimilar I mean, of course, with reference to a given basis of classification. Furthermore, in this arrangement of the prior art, since the top card of a bunch covers up the class indication of all the lower cards which differ from it and since any intervening dissimilar card covers up the indications of any lower cards of the same class as that on top, there is a very limited indication of the way in which the cards of a bunch are arranged. This is true not only of a bunch of unassorted cards, but also of a bunch of assorted cards consisting of more than one class. These several disadvantages may be avoided by the use of my invention, in which the edges of the cards are used in noting the classification data, thus permitting not only a face use of the indications but an edge use as well.

My invention also affords, in addition to a limited surface information of the classification of the cards; viz, of the one class on top, complete information of the classification of all the cards in a bunch. Thus for example, when the cards are assorted into classes and then bunched, the fact of their arrangement by classes is evident upon an inspection of the edges of the cards without disturbing them; and any card incorrectly arranged may be quickly detected and easily re-arranged in proper place among the other cards of the same class, with a minimum of time and effort.

In its preferred form my invention contemplates the combination of edge indications with the now prevalent interior perforations. The edge indications may take the form of notches, and when in this form they offer very material aid in assorting the cards.

The features of my invention will be better understood by reference to the accompanying drawings, in which:

Figure 1 illustrates a card with edge indications applied in accordance with my invention. Fig. 2 illustrates the face of a card provided with both edge indications and interior perforations. Fig. 3 illustrates a bunch of cards which have been assorted by one classification. Figs. 4 and 5 show the same cards assorted in accordance with other classifications; Fig. 6 illustrates in perspective the use of my invention in assorting cards; and Fig. 7 illustrates the method of assorting.

It is frequently the case, especially in census work, that a given card is classifiable on two or more bases, coördinate or otherwise. For example, the operator of a farm re-

ported on a schedule or represented by a card may be classed as white or colored, on the basis of color; as owner or tenant, on the basis of tenure; as a large or a small farmer, on the basis of area cultivated; and as a hay-and-grain farmer or a miscellaneous farmer, on the basis of the predominating product. In actual practice most of these different bases have a larger number of classes than I have given, but the principle being the same, the number of classes is herein limited to two for each basis, as a matter of brevity and simplicity in handling the illustrations. These four classifications may be given different fields or portions of the periphery of the card. Thus, the color classification may be on one edge, the tenure classification on a second, and the farm area and product classifications on the third and fourth edges, as shown in Fig. 1. Here the upper edge of the card shows at W and C the two color classes, it being understood, of course, that the upper edge of the card is to be notched at a given distance from the corner when the card is to represent a white farmer, also that the card will be notched at a different predetermined distance from the corner when the card is to be marked to represent or indicate a colored farmer. In this figure, the right-hand edge of the card shows at O and T the two tenure classes. The lower edge of the card shows at L and S the two area classes, and the left-hand edge at H and M the two product classes. If the upper edge, for example, is divided into fields, one part of the edge being used to indicate the color class, another part of the edge to indicate the tenure class, etc., as illustrated in Fig. 2, then, as in Fig. 1, the edge of the card may be notched at W or C to indicate the color class, at O or T to indicate the tenure class, at L or at S to indicate the area class, and at H or M to indicate the product class. It is not essential, of course, that the fields follow this precise arrangement, in which the first field at the left-hand end of the upper edge is devoted to the color classes, the field adjoining to the right to the tenure classes, the next field to the area classes, and the field at the extreme right to product classes.

The appearance of a bunch of assorted cards and the advantages arising from having the classification indicated on the edge instead of on the face of the card are illustrated in Figs. 3, 4 and 5, in each of which is shown an edge view of a bunch of ten cards, variously punched or notched according to the classifications shown in Fig. 2. The shaded portions of the edges of the cards under W, C; O, T; L, S; H, M, indicate the classes in which the perforations or indications are made. Thus the top card in each of these figures is notched at W, O, L and H, thus indicating a white owner of a large farm devoted to hay. The bottom card in each case is punched at C, T, S, and M, indicating a colored tenant of a small farm devoted to miscellaneous crops.

The interior perforations shown in the card illustrated in Figs. 1 and 2 of the drawings may be provided with advantage in cards carrying edge classifying notches in accordance with my invention, for the purpose of facilitating the operation of automatic machines of suitable type employed for totalizing the data represented by the statistics cards. It is immaterial what data is represented by these interior perforations or what the form of totalizing machine is that is employed to totalize the data of various kinds. Furthermore, the surface of the cards may be conveniently divided into different fields, as indicated for the card shown in Fig. 2, so that the interior perforations in each field may represent specific data of a certain kind related or not, as desired, directly to the other data upon the card. For example, for the card shown in Fig. 2, the field of the card having the edge notches for determining whether a farmer is white or colored, may be devoted to the age of the farmer, and the perforations through the card may have numerical value according to the horizontal lines upon which they are made, the several orders of units being determined by the vertical lines upon which they are made. Thus, the farmer's age would be, for the indication of Fig. 2, fifty-nine years; similarly, the second field, in connection with which the edge notches determine whether the farmer is an owner or a tenant, may be devoted to the value of the property, and for the card shown in Fig. 2 would indicate $9,573.00; similarly, the third field, in connection with which the edge notches indicate that the farmer is a large or small farmer, might be devoted to describing the number of acres in the farm, in which event the interior perforations indicated would show 603 acres; similarly, the fourth field, in connection with which the edge notches indicate whether the farm is devoted to hay and grain or miscellaneous products, may be devoted to showing the value of the crops for the last year, and for the perforations indicated in Fig. 2, this would be $5,040. As a result, when it is desired to learn for any purpose the average age, value of the property, acreage, or value of products for the last year for any one of the four classifications indicated by the edge notches, the particular class may at once be selected and then where desired, one of the two sub-classes, after which, by feeding the selected cards through the totalizing machine, so that the totalizing mechanism engages the particular field it is desired to totalize, the desired amount could readily be found. If an average is required, it may

then be readily obtained by dividing the total by the number of cards totalized. It will, of course, be understood that the interior perforations may be devoted in any of the various fields to any desired purpose, the illustration just given being merely for explanatory purposes.

In Fig. 3 the cards are assorted by color and to simplify the specification it has been arbitrarily assumed that all the colored farmers are tenants, thus permitting in one figure the illustration of the assortment of the card by tenure as well as by color. It will be noted in this Fig. 3 that all of the cards representing white farmers are placed on top, the two cards corresponding with colored farmers being placed at the bottom. It will be noted also that the cards representing the white owners have been placed on top of the cards representing white tenants.

In Fig. 4 the same cards have been assorted by relative sizes of farms and in Fig. 5 by predominating products.

The misplacement of a card in the wrong class would be indicated by a break in the continuity of the column of holes or notches which indicates that class. Two such breaks are shown in the white class in Fig. 4—one near the middle and one at the bottom. These breaks, however, are proper in this case, as the cards are not arranged in this figure on a color classification, but on an area classification, and under L and S in this figure no breaks occur. To illustrate the use of this exterior indication of classes after the cards have been assorted, Fig. 4 should be considered further, where the farms are shown as equally divided into large and small. It is evident at a glance that in each of these classes a greater number are worked by tenants rather than by owners. It is further easily seen that white farmers are equally represented in each of the area classes, as are also colored farmers; and as it happens in this illustration, so also are owners and tenants. In Fig. 5, where the cards are arranged by products, the following lateral facts are easily observed; while the miscellaneous predominate over the hay farms, the latter are confined to the white classes and are evenly divided between owners and tenants. In the miscellaneous class are found all the colored farmers and a large predominance of tenants. Indeed, with a little system in arranging the final classes, it is quite feasible to read, by means of these exterior class-indications without disturbing the cards at all, the entire summary of their classifications.

The edge perforations afford facilities for separating the classes manually by means of a needle, as illustrated in Fig. 6. This is done by slipping the end of the needle 10 sidewise down to the bottom of a set of such perforations, for example, the perforations at O, and then endwise between the two classes, the needle being held in a horizontal position instead of perpendicularly to the cards as heretofore. This permits the classes to be separated more quickly and with little or no sidewise displacement of the cards. This separation was very much more difficult of accomplishment when perforations in the interior of the cards were used to indicate the classification data.

Not only do the edge perforations or notches serve in the capacity of indices as heretofore described, but they lend themselves readily to mechanical assorting of all of the cards of a given class simultaneously from a bunch of unassorted cards, without reference to intervening classes. This manner of assorting is illustrated in Fig. 7, where I have shown the bunch of cards arranged as in Fig. 4. The knife edge 11 may be laid upon a table or flat surface, and an operator by laying the cards edgewise across this knife edge may cause the assortment of these cards into two groups in accordance with the product classification.

In order that the cards may slip one upon the other, they should be held rather loosely and slightly agitated, if necessary, to overcome friction. The cards which drop down over the knife edge onto the table are those which are notched at H. Those which ride upon the knife edge are not notched at H, but rather at M. After the preliminary displacement of the "hay" cards with respect to the "miscellaneous" cards, the hay cards may very easily be entirely removed from the pack by catching the upper right-hand corners with the fingers. To aid in the separation, the knife edge 11 may be moved toward the right, while the miscellaneous cards are prevented from moving by the hand or some other means applied to the upper right-hand corners. The knife edge will serve to move the hay cards toward the right until the miscellaneous notches are reached. This degree of separation will be ample to enable the operator to make the separation complete by the use of his hands alone. The separation may be accomplished if desired, by the aid of needle holes at 12, 12, each card being provided with such a separating hole at a given location with respect to the boundary lines of the card. After the preliminary separation has been effected, a needle 13 may be thrust through the separating holes to aid in the completion of the separating operation. This separation of the two classes does not necessitate the separate handling of each card or even of each bunch of adjoining similar cards as has heretofore been necessary. The separation may be accomplished almost as readily with the most promiscuous arrangement of the cards as where they are to a certain ex-

tent bunched or grouped in accordance with the classification data on any one basis.

It will be apparent, therefore, that my invention contemplates a bunch or stack of cards or similar sheets, each card being provided with edge indications of its classification data, the edge indications preferably taking the form of notches, these notches being a very material aid in assorting and serving, if desired, with a knife edge, to effect a mechanical assortment of the cards, such assortment being completed in some cases by the use of a separating needle and the separating holes already described.

The classification data may be far more complex than that illustrated in the accompanying drawings. The classifications may be made upon a greater or less number of bases without affecting the merit of my invention. So also the statistical data, appearing upon the various cards either in the form of perforations located in accordance with a predetermined scheme or in the form of written legends, may be simple or complex also without affecting the spirit and scope of my invention.

Generally I do not wish to be limited to the precise details of the form or arrangement herein disclosed, as various modifications will readily occur to those skilled in the art.

What I claim as new and desire to secure by Letters Patent is:

1. A card for a statistical system, having a notch or notches on one edge for classifying the card on one basis and a notch or notches on another edge for classifying the card on a second basis.

2. A card for a statistical system having a notch or notches on one edge for classifying the card on one basis and a notch or notches on another edge for classifying the card on a second basis, such card also having one or more perforations through its body portion for giving the card a value upon a desired basis.

3. In a statistical system, the combination of a plurality of cards each having a notch or notches on one edge for classifying the card on one basis and a notch or notches on another edge for classifying the card on a second basis, and a bar adapted upon motion thereof relatively to the cards to separate cards of one class on either basis from the remaining cards.

4. A card for a statistical system having a notch or notches on one edge for classifying the card on one basis, and one or more perforations through its body portion for giving the card a value upon a desired basis.

5. A statistical card, having a plurality of fields for receiving statistics and an edge notch associated with each field for which it is desired to assign a value to said card, the position of each notch in its field determining the value of the card in said field.

6. A card for a statistical system having notches on its edge arranged in groups, the notches of each group serving to classify the card in different classes, and the location of a notch in any group serving to classify the card in sub-classes in the corresponding group, such card also having one or more perforations through its body portion corresponding to the value of the card upon a desired basis.

7. In a statistical system, a plurality of statistical cards adapted to be arranged in a pack, each card having a plurality of notches on the edge corresponding to sub-classes grouped in different main classes, a coöperating member adapted to enter said notches, motion of the member relatively to the cards serving to displace from the pack any desired sub-class, depending upon the position of the member relatively to the cards and each card having a perforation for removing the cards which have been displaced by the action of said member.

8. In a statistical system, a plurality of statistical cards adapted to be arranged in a pack, each card having a plurality of fields for receiving statistics, and edge notches associated with each field, said edge notches being subdivided as to location to represent different values in the class corresponding to the associated field there being not more than one edge notch in each card for each field.

In witness whereof, I hereunto subscribe my name this 23rd day of July A. D. 1908.

CHARLES H. TALLMADGE.

Witnesses:

WILLIAM J. CRUMPTON,

LEONARD W. NOVANDER.