

A. R. DRESSEL.
ART OF MAKING BOOKS.
(Application filed Apr. 19, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig.1

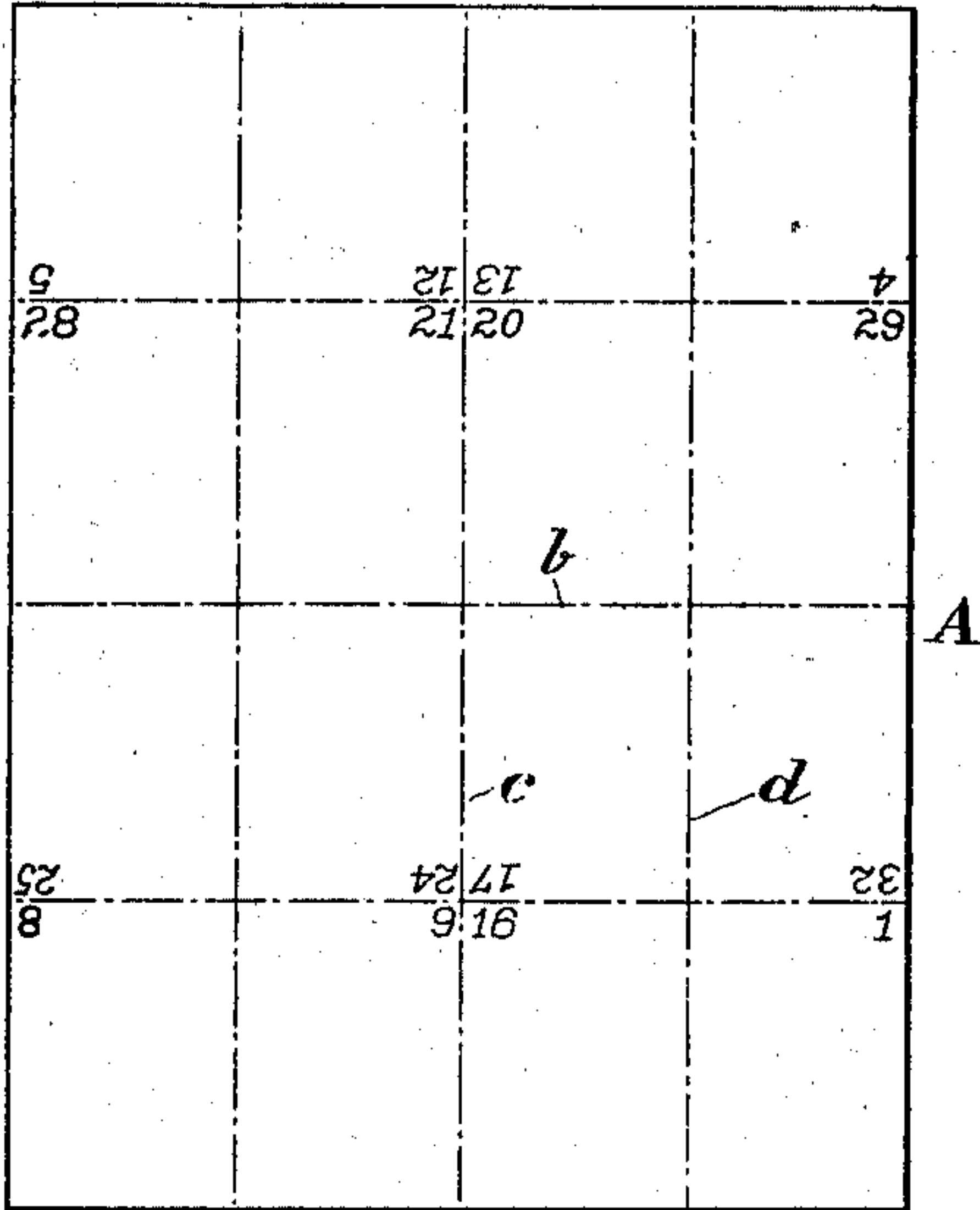


Fig.2

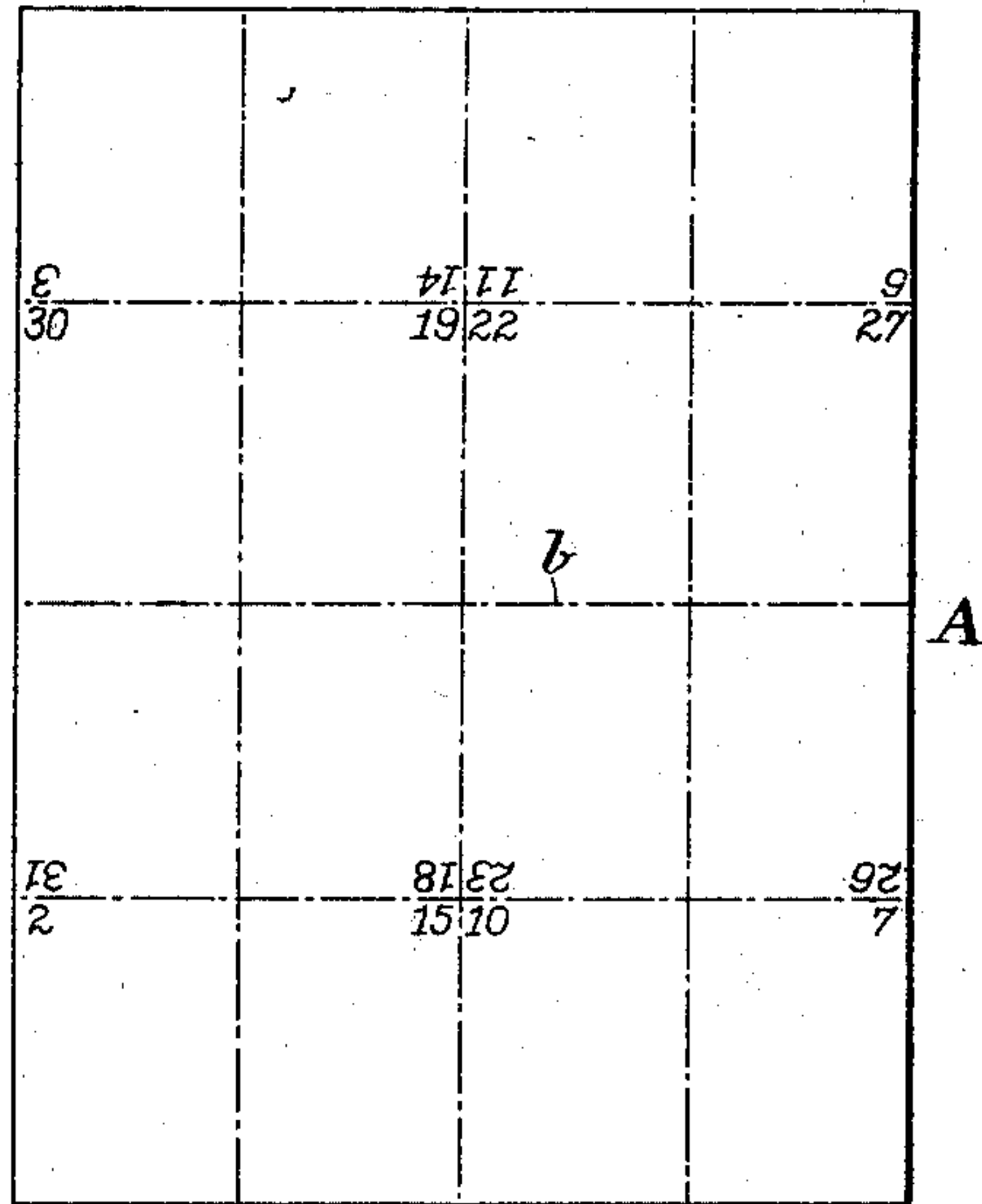


Fig.3

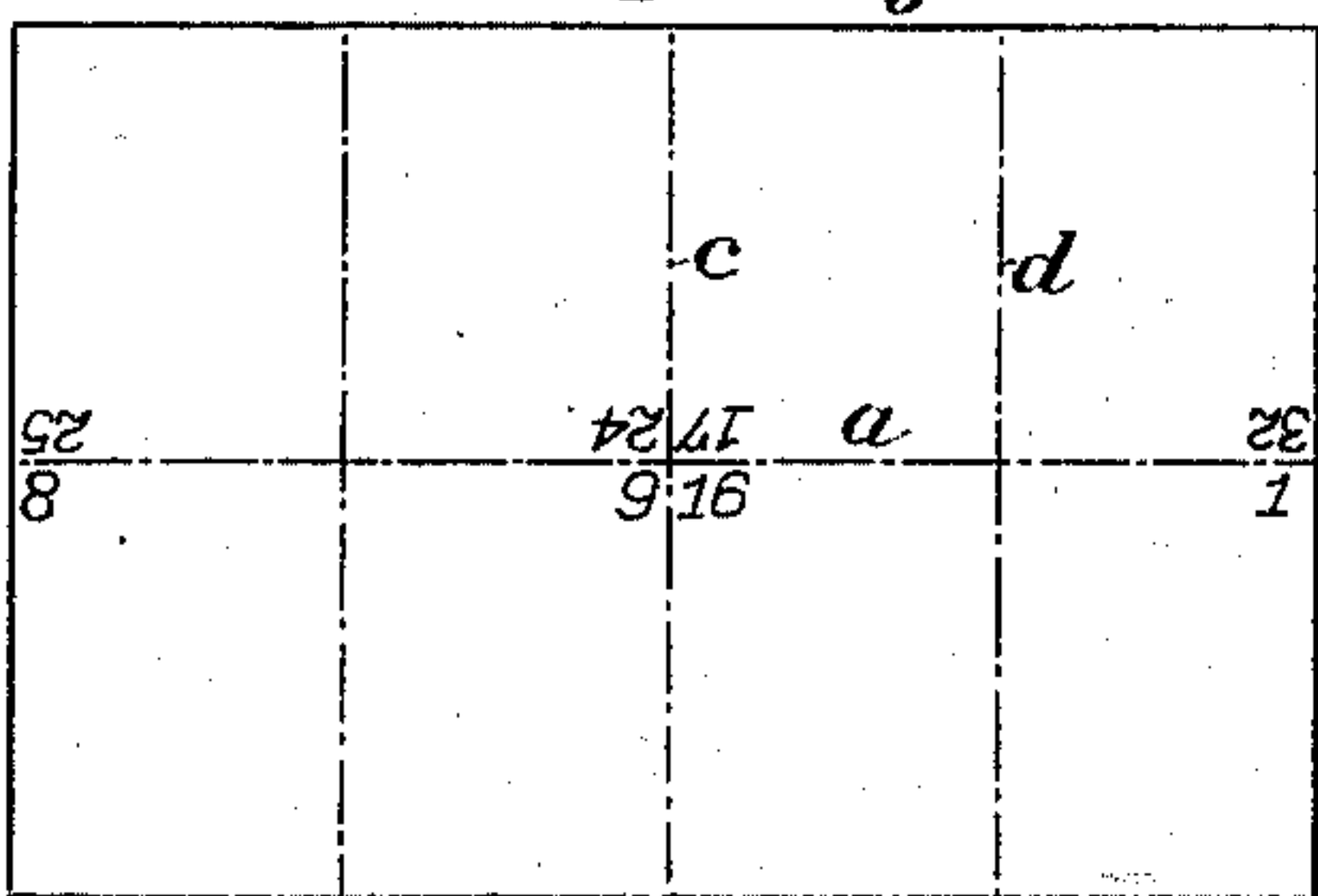


Fig.4

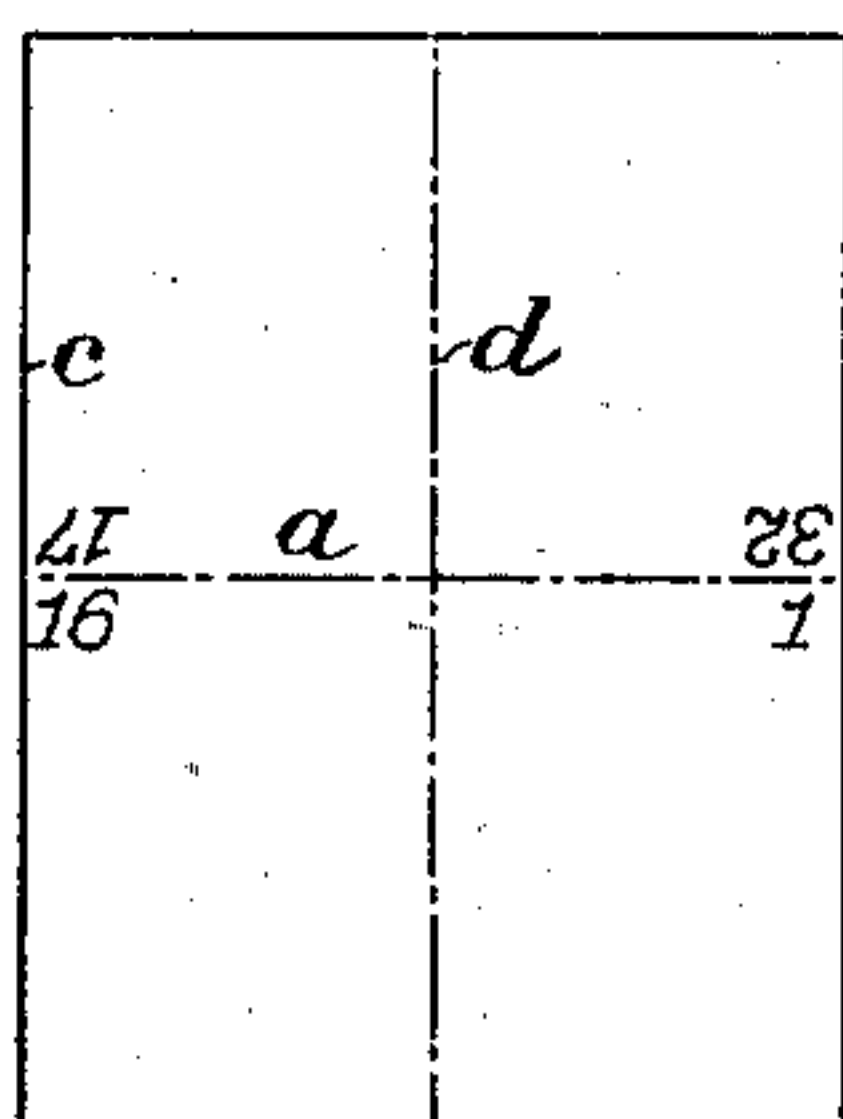


Fig.5

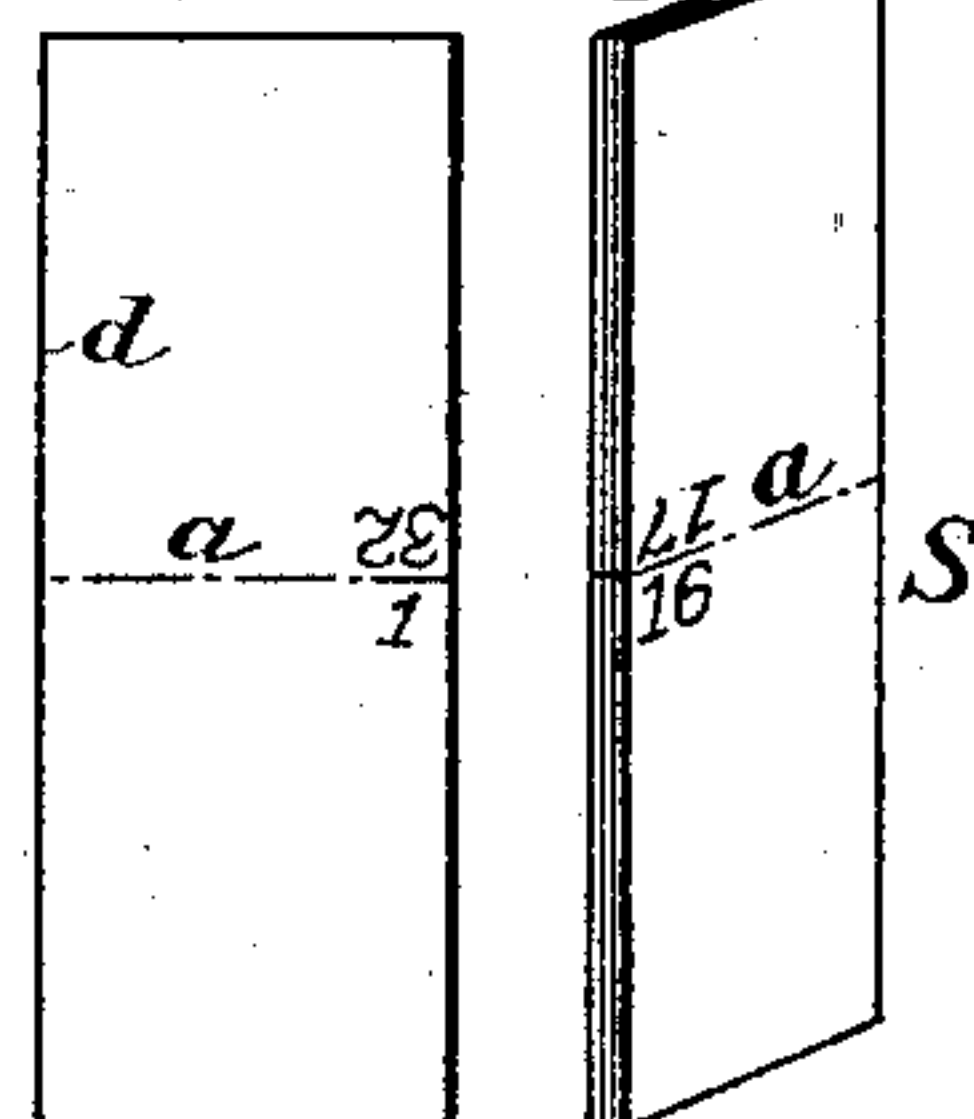


Fig.6

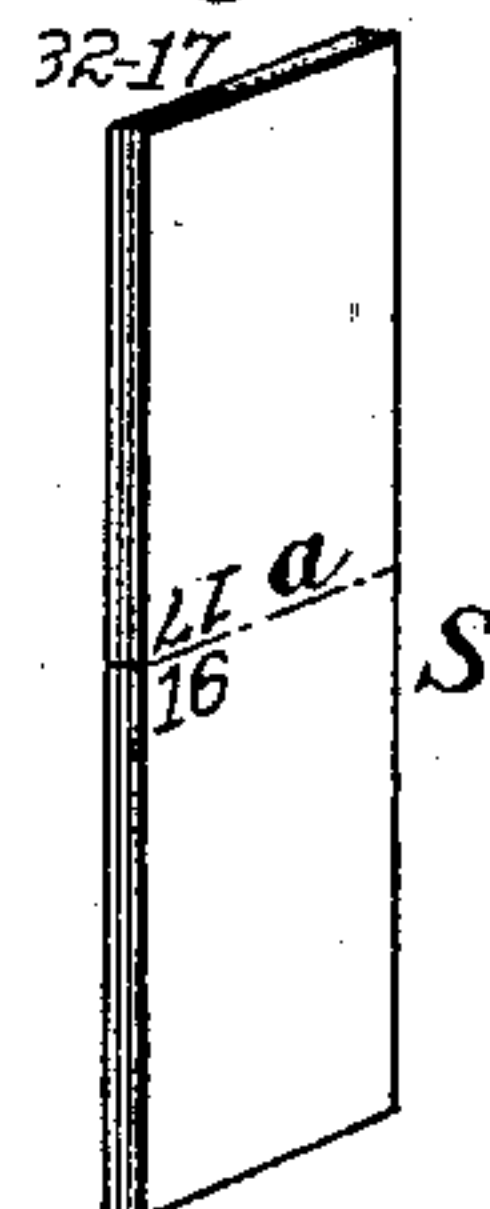


Fig.7

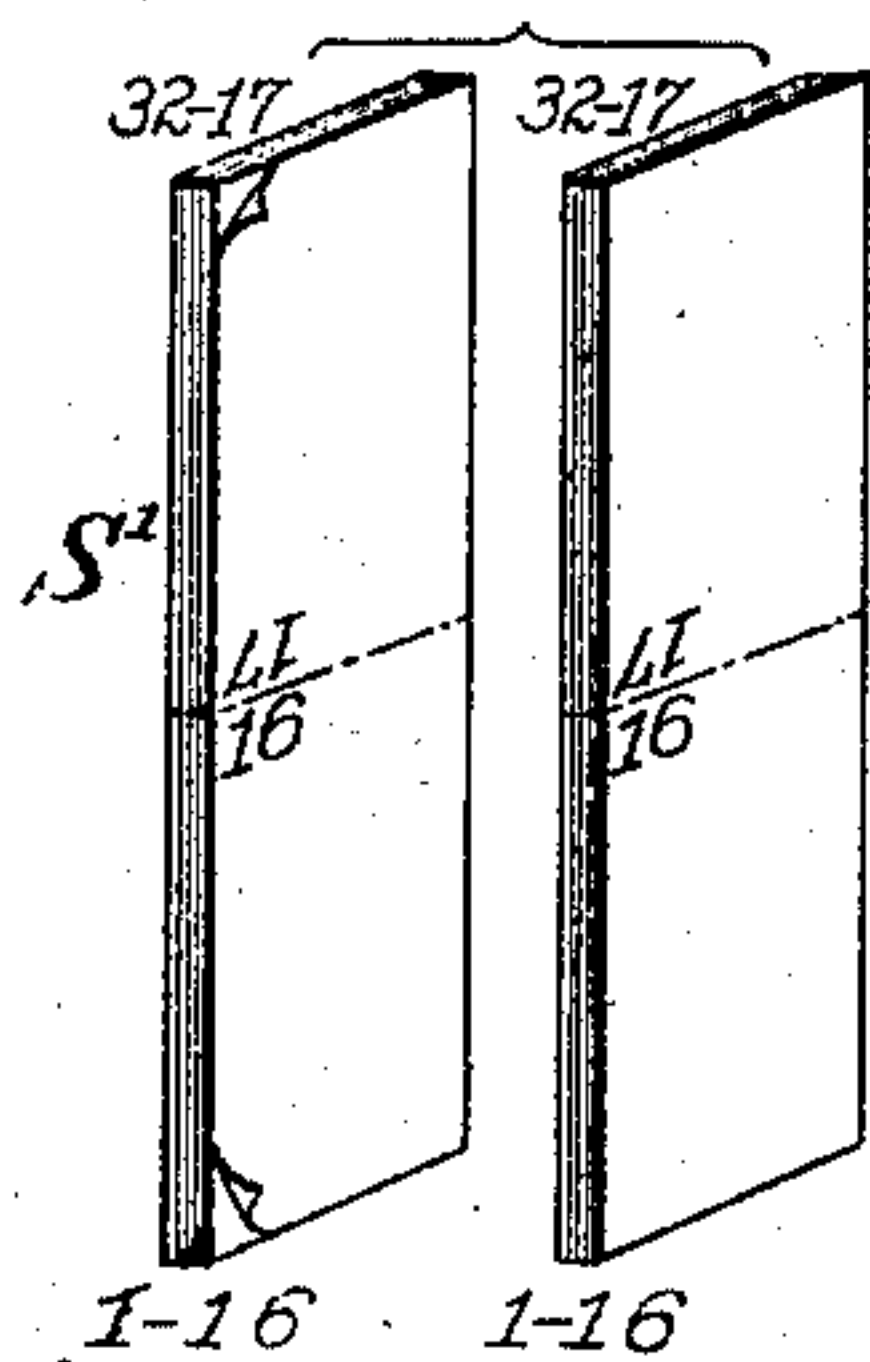


Fig.8

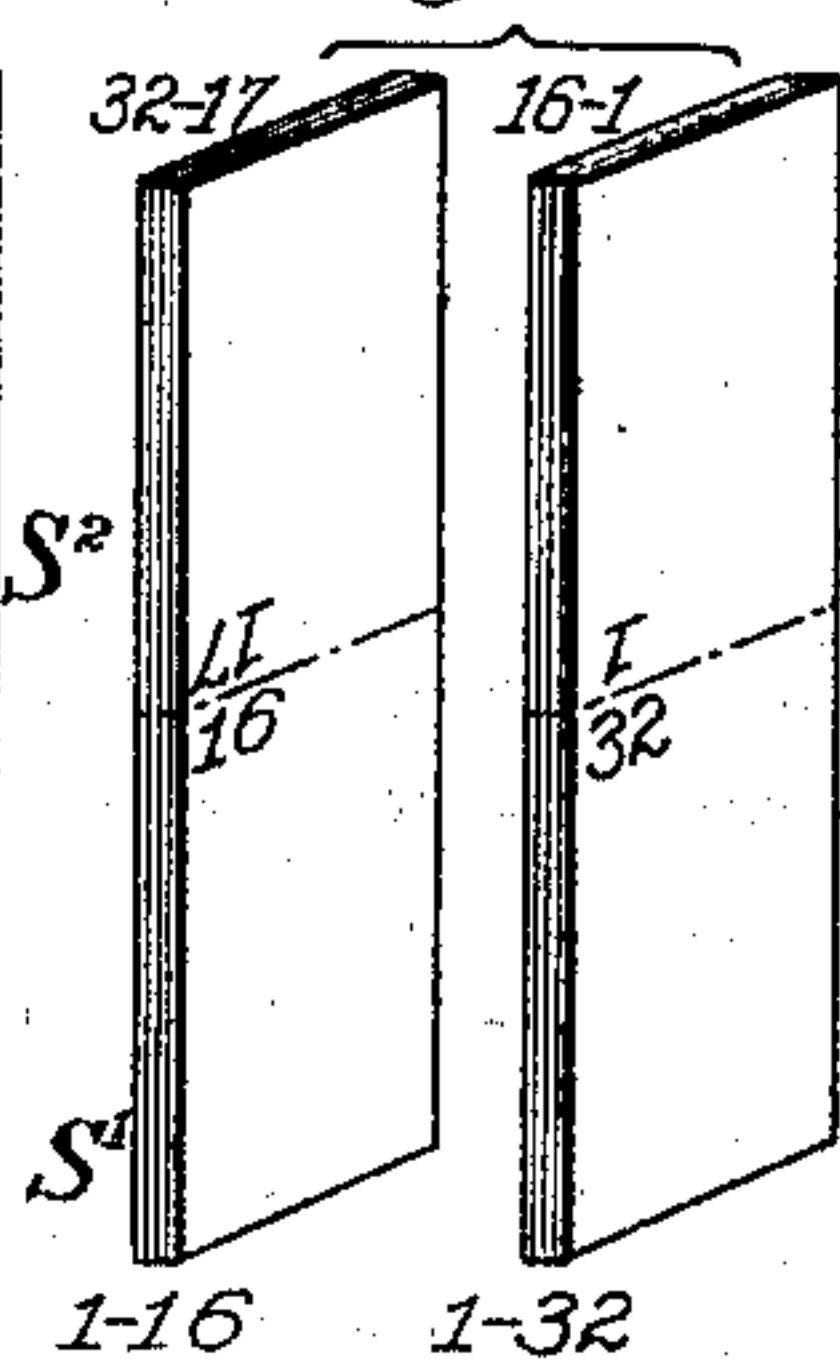


Fig.9

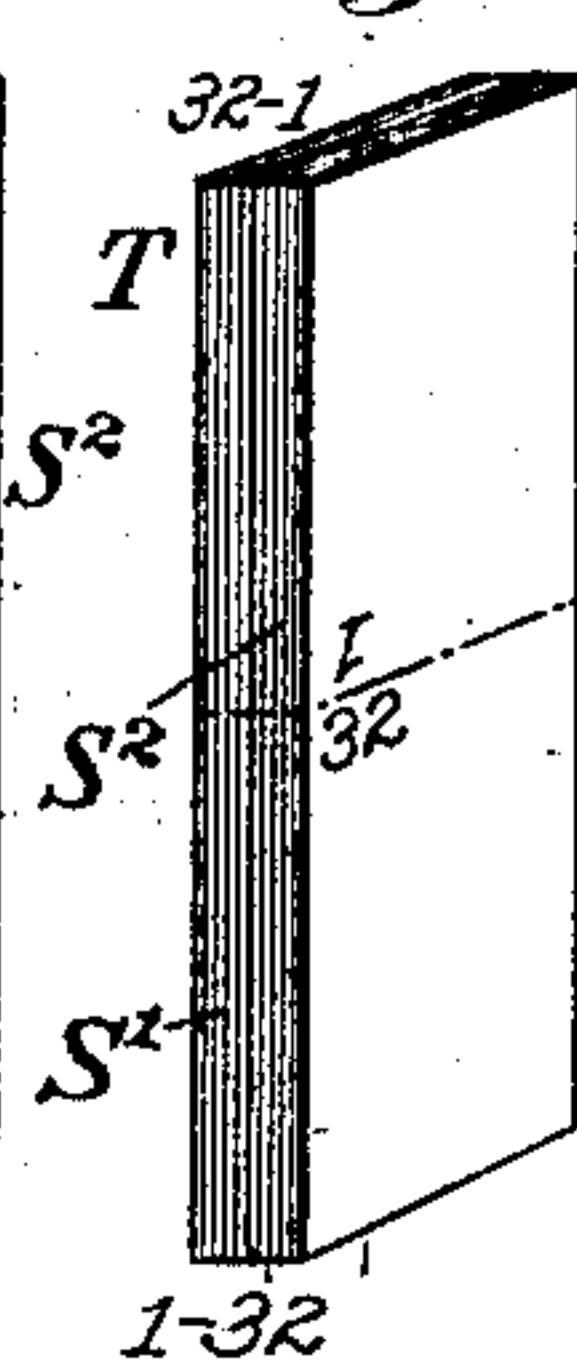


Fig.10

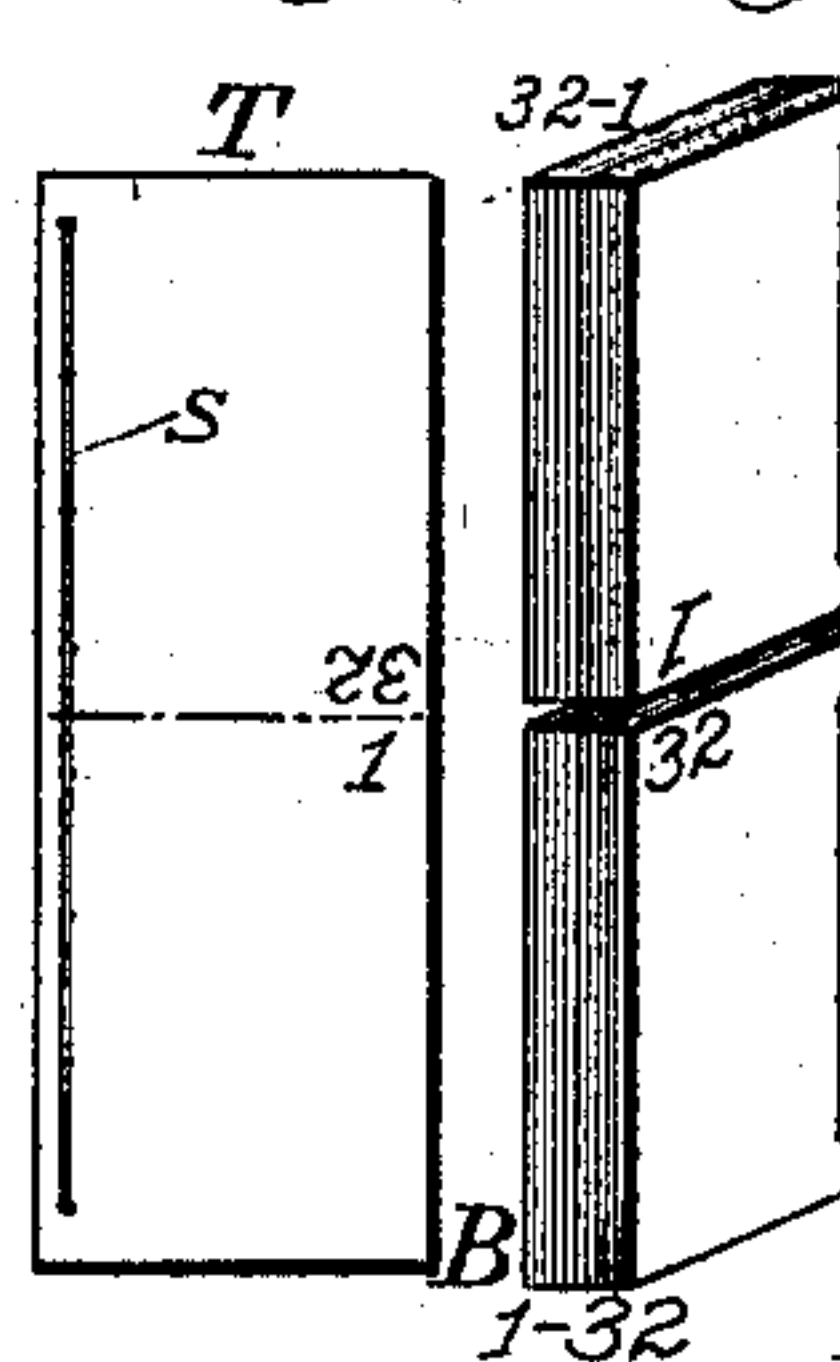


Fig.11

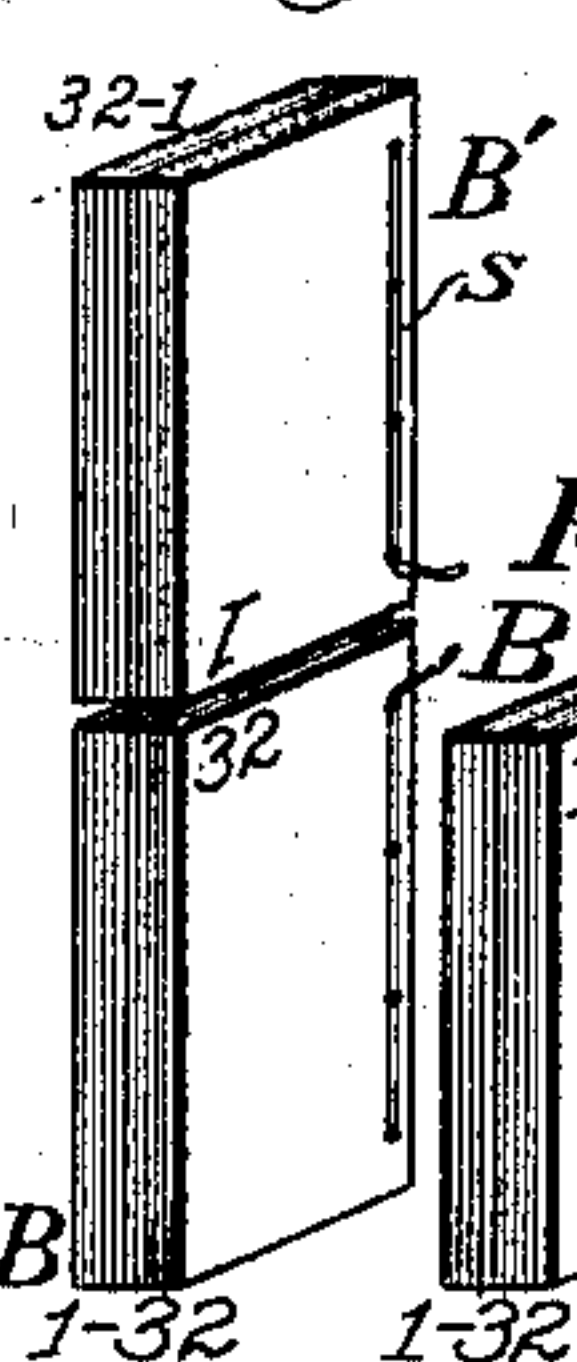
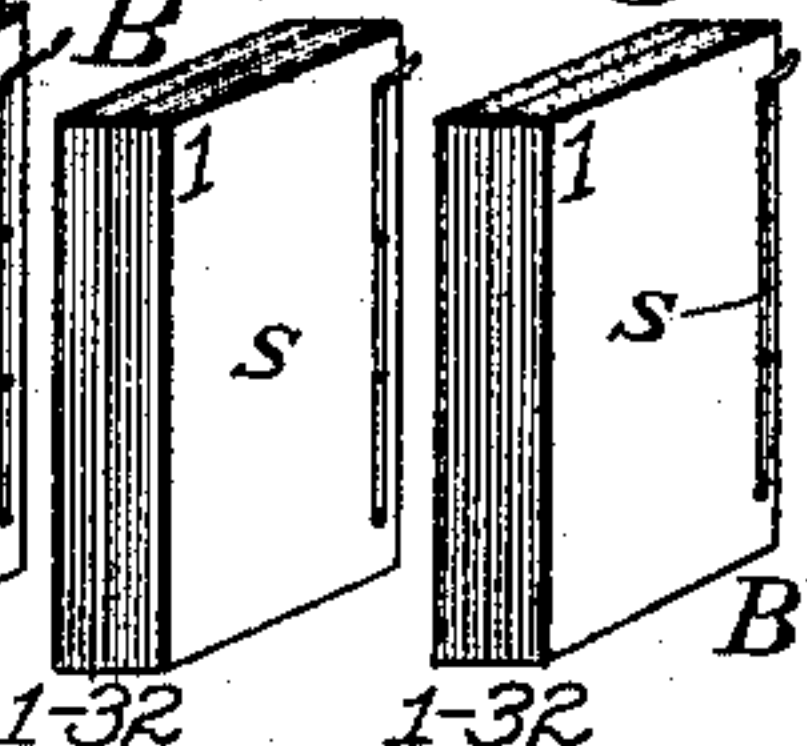


Fig.12 Fig.13



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ART OF MAKING BOOKS.

(Application filed Apr. 19, 1900.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 14

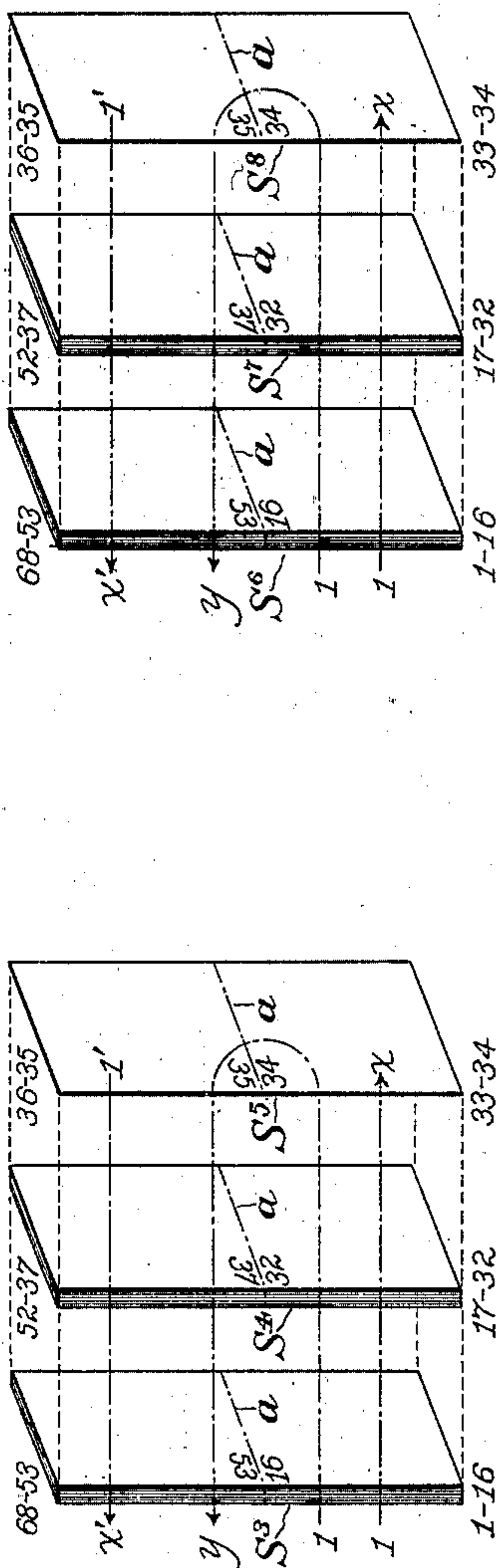


Fig. 17 Fig. 18 Fig. 19

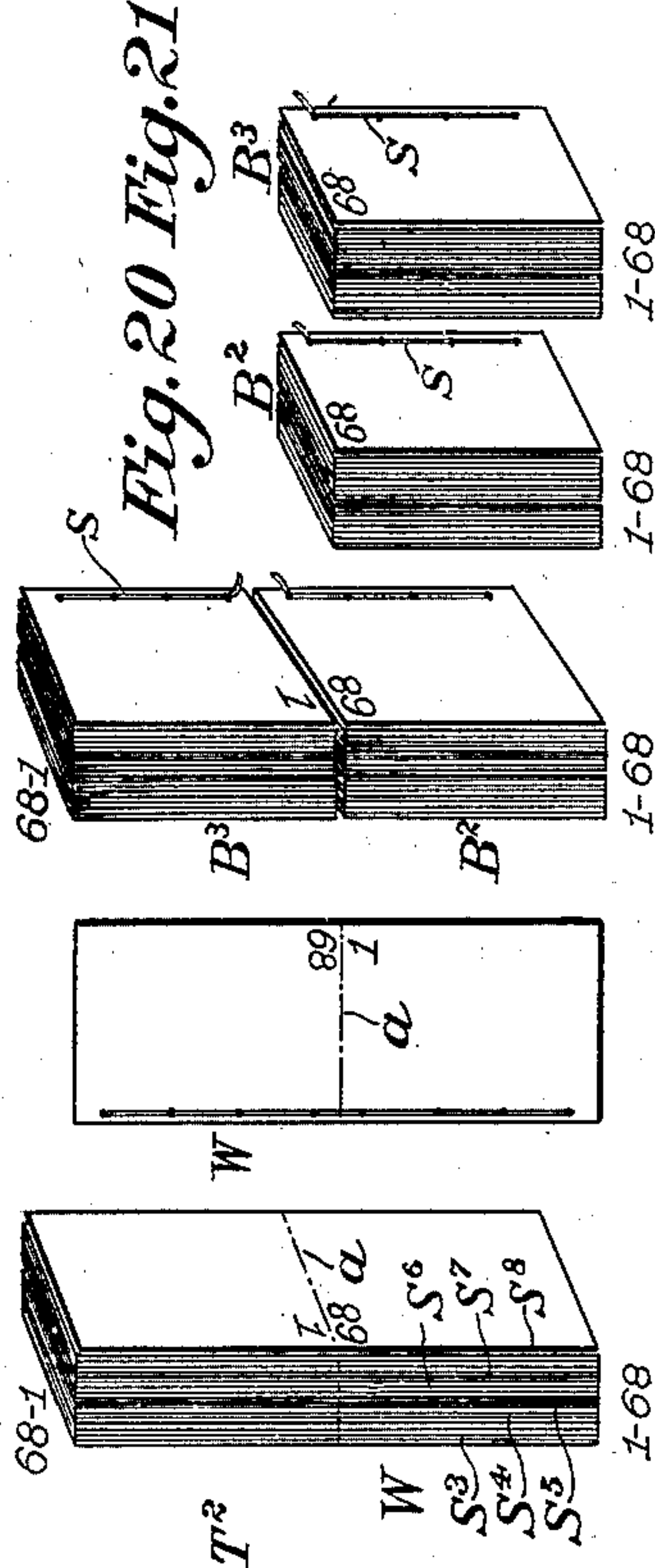


Fig. 15 Fig. 16

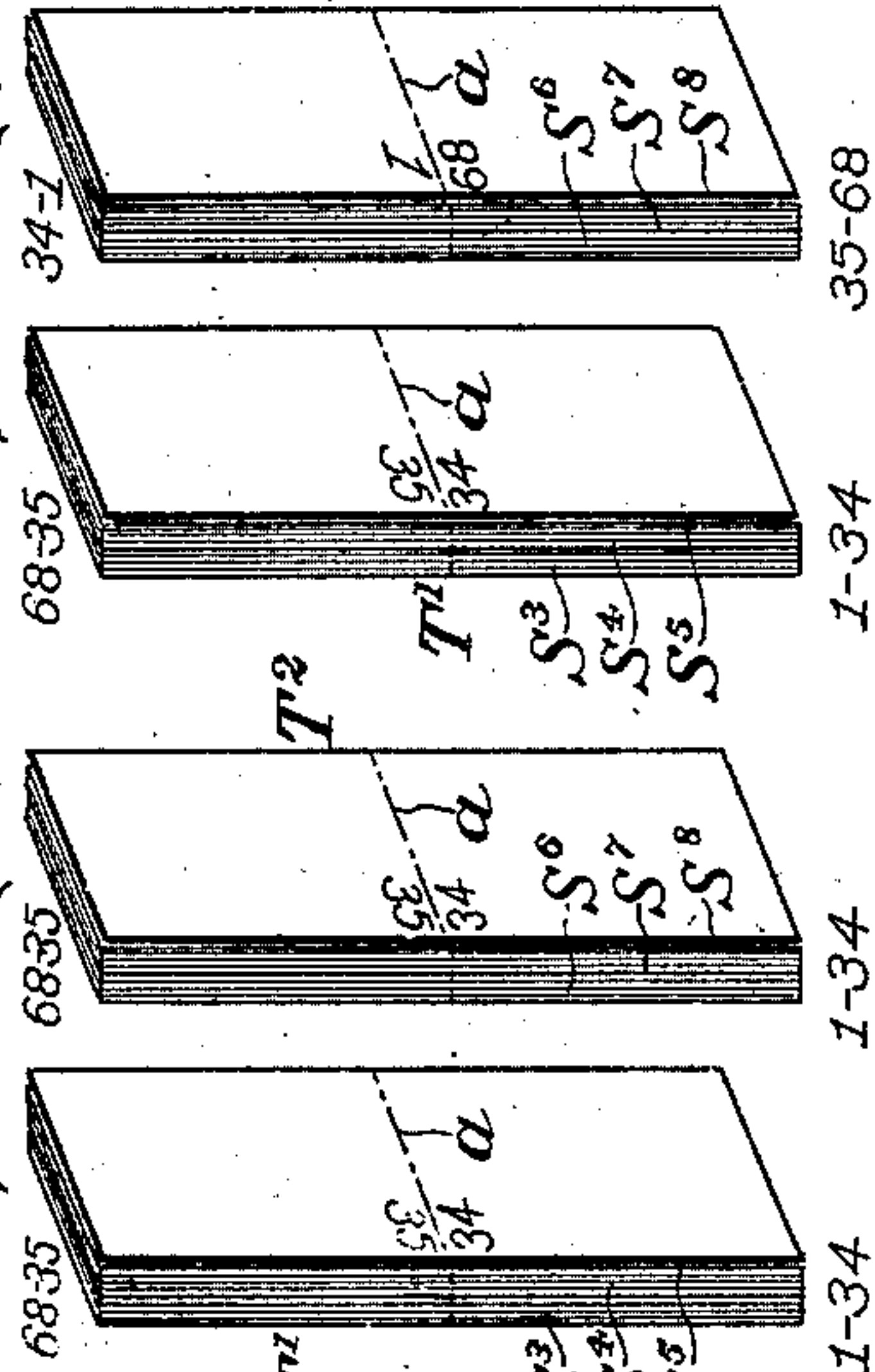
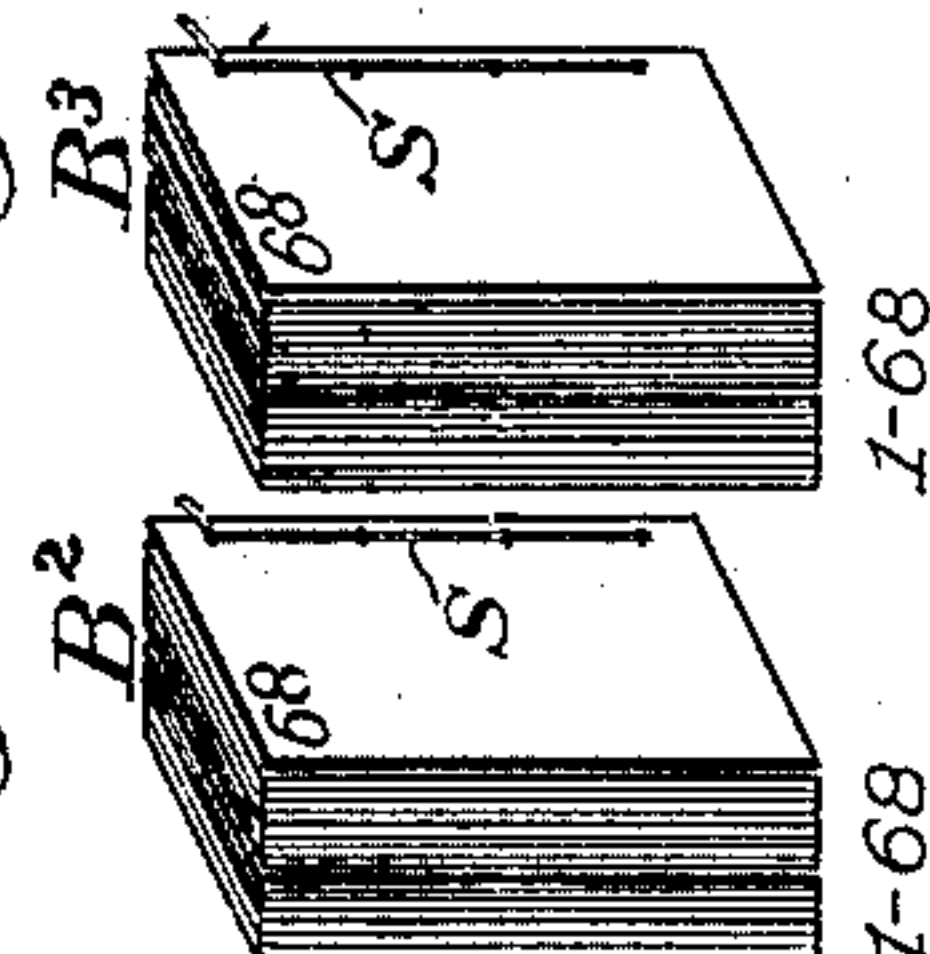


Fig. 20 Fig. 21



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UNITED STATES PATENT OFFICE.

ALBERT R. DRESSEL, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF
TO DAVID WILLIAMS, OF NEW YORK, N. Y.

ART OF MAKING BOOKS.

SPECIFICATION forming part of Letters Patent No. 702,413, dated June 17, 1902.

Application filed April 19, 1900. Serial No. 13,418. (No model.)

To all whom it may concern:

Be it known that I, ALBERT R. DRESSEL, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in the Art of Making Books, of which the following is a specification.

This invention relates to improvements in the art of making books, in which sheets are printed with the pages thereof imposed thereon in a predetermined manner, after which the sheets are folded to form signatures and the signatures assembled and united to form books.

My present invention relates both to improvements in the art of book-making and to single signatures, sets of assembled signatures, and books formed by my improved method. One of the chief objects of the invention is to provide a more economical method of forming and handling signatures, assembled sets of signatures, and books made up of such signatures.

In practicing my invention the separate sheets of paper are printed on both sides with the pages imposed in such a manner that when the sheet is folded to form a parallel-fold signature the signature will comprise two uninterrupted series of consecutive pages located, respectively, at opposite sides of a central transverse line forming a division-line along which the completed (folded) signature may be cut, this line being transverse to the last parallel fold or binding edge of the double signature, as in the old-style parallel-fold signature. A signature formed in this manner I term a "double signature," for the reason that when so cut two complete single signatures result, each of which may be assembled with the other or with others to form a set of signatures or book, this double signature being in the present case of the parallel-fold type—that is to say, it is a signature in which the last two fold-lines of the sheet are parallel to each other and transverse to at least one previously-formed fold-line. The pages of each double signature will preferably be so disposed that the tops of the pages of one series will face and be connected with the tops of the pages of the other series, and, moreover, these series will ordinarily run in

opposite directions, the first series including one set of pages and the other series including a later set corresponding in number to the first series, but paged successively as may be required in accordance with the position of the signature in the completed book and in accordance also with the total number of pages contained in said book.

An important feature of my invention is the manner in which the printed parallel-fold double signatures are formed into sets of signatures or books with a minimum expenditure of time and labor in handling and assembling the signatures and forming the finished unbound books ready for covering by the bookbinder, and this with much less loss of paper than results when books are manufactured from parallel-fold signatures such as heretofore used.

In the old form of parallel-fold signature there are not two uninterrupted series of consecutive pages at opposite sides of the division-line of the signature, but instead there are two interrupted series, or rather there are four series, two at each side of such division-line, and no two series are consecutive. In the present case the pages are so imposed in printing and the sheet is so folded that when the double signature is completed it has two uninterrupted series of pages, one at each side of such division-line. Two or more of these signatures may be printed with the pages so imposed that the pages of corresponding halves of different double signatures may be consecutive and one series may follow directly after the other, so that for a book of any given number of pages one half of the pages may constitute one series and be disposed at one side of the division-line of the assembled signatures of a set, while the succeeding half of the pages of such book may be disposed at the other side of such division-line, and when double signatures or duplicate sets of signatures printed in this manner are assembled in opposite positions the assembled signatures or sets may be united and two complete unbound books formed by simply dividing the assembled signatures at the division-line thereof. The manner in which this result is accomplished will be more fully set forth hereinafter in the specification and

is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a front view of a 32mo sheet having its pages imposed in accordance with my present method. Fig. 2 is a back view of said sheet. Fig. 3 is a front view of the sheet folded once. Fig. 4 is a front view of said sheet folded a second time. Fig. 5 is a front view of a completed double signature formed by folding the sheet a third time on a line parallel with the line of the second fold. Fig. 6 is a perspective view of said double signature. Fig. 7 is a perspective view illustrating duplicated double signatures in corresponding positions. Fig. 8 is a similar view illustrating said signatures in opposite positions. Fig. 9 is a similar view showing said oppositely-disposed double signatures assembled. Fig. 10 is a front elevation showing said assembled signatures united at their edges, as by sewing. Fig. 11 is a perspective view illustrating two sets of single signatures disposed in opposite positions and formed by dividing such set of assembled double signatures. Figs. 12 and 13 are perspective views of the same, showing them in corresponding positions. Fig. 14 is a perspective view illustrating duplicate sets of assembled double signatures, showing the manner in which a plurality of double signatures of different kinds may be assembled preparatory to forming two like unbound books. Fig. 15 is a similar view showing the signatures of the individual sets assembled with the sets disposed in similar positions. Fig. 16 is a similar view showing the assembled individual sets in opposite positions. Fig. 17 is a similar view showing the two individual sets assembled. Fig. 18 is a front elevation showing said sets united by sewing at the inner edges of the signatures. Fig. 19 is a perspective view illustrating said assembled sets separated at the line of division of the double signatures to form two unbound books disposed in opposite positions, and Figs. 20 and 21 are perspective views of said completed unbound books disposed in similar positions.

Similar characters designate like parts in the different figures of the drawings.

In the book-making art as heretofore practiced there have been two principal methods of forming signatures to be afterward assembled, one being the method known as "transverse folding" and the other that of "parallel folding." In the method of transverse folding all of the pages of a signature usually constitute a single uninterrupted series of consecutive pages; but there is a great waste of paper by this method, as the top of every page of the signature has to be cut away for a considerable distance and is wasted. In the old form of parallel-fold signature, however, this waste of paper is avoided by folding each sheet so as to constitute a double signature, with the tops of the pages of each single series facing and connected with those of the other single series, which double sig-

nature when divided at the line between the single signatures forms two separate signatures, the tops of the pages of which do not need to be trimmed. With this old style of parallel-fold signature, however, two different sets of plates are required, and when only a limited edition is to be run off this extra set of plates is a very expensive item of the cost of producing the edition.

By the present method of forming signatures and assembling them to form sets of signatures or completed unbound books the waste of paper incident to the old method of making books by the transverse folding of the signatures is avoided, while I am enabled to dispense with the extra set of plates required with the old parallel-fold method of forming signatures and books, and this saving is a very important one when small editions are to be printed, as is usually the case. Moreover, in addition to this saving there is a great saving of time and labor in the handling of the finished signatures and in the assembling and manipulation of them to form completed unbound books, as will be evident from the following description of the manner in which the several operations are performed according to my improved method.

It should be understood, of course, that (within limits) any desired number of pages may be formed from a single sheet and that my invention is applicable to all of the various well-known modes of imposition, such as the octavo, duodecimo, the 16mo, the 32mo, &c. In this case, for convenience, I have illustrated at A a sheet, which may be of any suitable size, with pages so imposed as to form a 32mo sheet embodying one feature of my invention. The manner in which the pages are imposed on the front of the sheet is clearly illustrated in Fig. 1, while the imposition for the back of the sheet is indicated in Fig. 2. The mode of imposing the pages is such that when the sheet is folded to form a parallel-fold double signature similar, so far as the folding thereof is concerned, to the old style of parallel-fold signature there will be two uninterrupted series of consecutive pages, one consecutive series lying at one side of the division-line of the double signature, while the other consecutive series will lie at the other side of such division-line. I consider within the scope of my invention any parallel-fold double signature having its pages disposed in this manner; but I prefer to so impose the pages that the pages of the two series will run in opposite directions, with the tops of the pages of one series facing the tops of the pages of the other series, this mode of imposition being clearly illustrated in Fig. 6, which shows a finished double signature consisting of thirty-two pages, pages 1 to 16 constituting one series and being disposed at one side of the division-line *a* of said double signature, while pages 17 to 32 lie at the other side of said division-line, constitute the other series, are equal in number to the first series, and

have the tops of their pages facing and connected with the tops of the pages of said first series. This signature is formed by folding the sheet A on line *b* to form the first fold, as seen in Fig. 3, the second fold being on the line *c* in Fig. 4, while the third fold is on the line *d* in Fig. 5, said line being parallel with the line *c*, the resultant completed signature being designated herein by S and consisting of two oppositely-disposed uninterrupted series of consecutive pages. This completed double signature having its pages imposed in the manner just described constitutes one of the most important features of my present invention, as it is by first forming parallel-fold double signatures having independent uninterrupted series of consecutive pages that I am enabled afterward to form assembled sets of signatures or complete unbound books without waste of material or the employment of an extra set of plates or unnecessary labor in the operations performed to obtain the finished product.

In the present case the term "book" is used to denote any collection of signatures properly assembled and united, whether in the form of a large volume, magazine, pamphlet, or other set of signatures, and in Figs. 7 to 13, inclusive, I have illustrated in detail the manner in which the simplest type of book is formed from two double signatures in accordance with my improved method.

In Fig. 7 I have shown duplicate parallel-fold double signatures embodying one feature of my present invention, these signatures being disposed in corresponding positions just as they come from the folder, said signatures being designated by S' and S². The signature S² is now reversed, so that it will be disposed in a position opposite to that of the signature S'—that is to say, while in the signature S' pages 1 to 16 will be the lower series and pages 17 to 32 will be the upper series, in the signature S² pages 17 to 32 will be the lower series and pages 1 to 16 will be the upper series. When the signature S² is reversed in this manner, its pages 17 to 32 will form a continuation of the series 1 to 16 of the signature S', while the series 1 to 16 of the signature S² will precede the pages 17 to 32 of the signature S' and will correspond in position therewith—that is to say, the tops of pages 17 to 32 of the signature S² will face the same way as pages 1 to 16 of the signature S' and will follow said pages, while pages 1 to 16 of the signature S² will face the same way as pages 17 to 32 of the signature S' and will precede said pages. When these two oppositely-disposed signatures are assembled as shown in Fig. 9, they will form a set of signatures, (designated in a general way by T,) in which set of assembled double signatures there will be a lower series containing pages 1 to 32 and also an upper series running in the opposite direction and also containing pages 1 to 32, the tops of the pages of one series connecting

with the tops of the pages of the other series. These assembled signatures should now be united in some suitable manner to form a double book—as, for example, by the usual line of stitching *s*—after which the double book or set of united assembled double signatures may be separated in the line of division *a* to form two oppositely-disposed single books or sets of single signatures, one set or book being designated by B and the other by B'. In Figs. 12 and 13 these completed unbound books are shown in corresponding positions, and it will be evident that they are duplicates, each consisting of thirty-two pages containing the same printed matter.

In the signatures just described it will be noticed that pages 1 to 16 and 17 to 32 of each individual double signature not only run in opposite directions, but that the two series are consecutive. It is not necessary, however, that they be consecutive, and, as a matter of fact, in forming books containing a considerable number of pages the two series of pages of each individual double signature will ordinarily be discontinuous.

In Figs. 14 to 21, inclusive, I have illustrated the manufacture of a pair of like books from duplicate sets of double signatures, in each of which sets there is an extra double leaf following two similar double signatures. The individual signatures of one of the sets shown in Fig. 14 are designated, respectively, by S³, S⁴, and S⁵, while those of the other set shown in said figure are designated, respectively, by S⁶, S⁷, and S⁸. In this case the signature S³ has thirty-two pages, the signature S⁴ thirty-two pages, and the signature S⁵ four pages, making sixty-eight pages in all in each set of double signatures. Now it will be noticed that in these signatures while each one comprises two uninterrupted series of consecutive pages, yet the two series of each of the first two double signatures of each set are not consecutive, but are discontinuous. In the set shown, for example, the first series of signatures S³ contains the initial series, pages 1 to 16, while the second series of said signatures contains pages 53 to 68. Pages 17 to 32 of the complete series of pages of the whole set constitute the first series of pages of signatures S⁴, while pages 37 to 52 constitute the second series of pages of said signature. In signature S⁵, however, the two series are continuous, the first series consisting of pages 33 and 34, while the second series consists of pages 35 and 36. Thus the complete series of pages of the whole set of double signatures is divided into two parts, the first half or pages 1 to 34, inclusive, being contained in a series of consecutive single signatures constituting the first half of the respective double signatures S³, S⁴, and S⁵, while the second half of said complete series of pages—namely, pages 35 to 68—is comprised in a complementary series of single signatures made up of the other consecutive halves of said double signatures. In other words, in making up a

book of any desired number of pages the total number of pages will be divided into two complementary series, one of which series may be represented by the arrow 1 x in Fig. 14 and will contain the first half of the total number of pages, while the complementary series or the second half of the total number of pages may be contained in the series represented by the arrow 1' x' . These two arrows run in opposite directions, and the series represented by them also run in opposite directions and are consecutive, the consecutive arrangement of the total number of pages for any given book being indicated herein by the arrow 1 y , which, it will be evident, represents two consecutive series of consecutive pages made up of the two complementary series 1 x and 1' x' or, in other words, of the two complementary series 1 to 34 and 35 to 68.

When the signatures of the respective sets shown in Fig. 14 are assembled in the manner shown in Fig. 15 to form sets of assembled signatures, there will result duplicate sets, such as T^1 and T^2 , each of which consists of a lower series containing pages 1 to 34 and an upper oppositely-running series containing pages 35 to 68. These duplicate sets of assembled signatures when assembled in reversed positions, as shown in Fig. 16, comprise two complete series of consecutive pages—that is, pages 1 to 68—pages 1 to 34 of the set being the first series of set T^1 , while pages 35 to 68 of the first total series are the second series of set T^2 . In a similar manner pages 1 to 34 of set T^2 and pages 35 to 68 of set T^1 constitute the second total series. These separate sets of assembled parallel-fold double signatures may be delivered to the bookbinder and constitute, when so assembled, an article of manufacture heretofore unknown in the art of book-making, so far as I am aware, as when so assembled it is merely necessary to reverse a pair of duplicate sets, as shown in Fig. 16, and assemble the sets as shown in Fig. 17, when all of the pages of the two complete series will be in their proper order, and the assembled sets may be united or sewed together and afterward separated at the line of division of the double signatures to form two complete unbound books. The line of division is indicated in these views, as in the preceding views, by a and the line of sewing by s .

By simply forming parallel-fold double signatures having their pages imposed in the proper manner and then assembling the several signatures side by side in the manner just described and afterward assembling in opposite positions duplicate sets of such assembled signatures all of the sections will be brought into proper positions for uniting or sewing without any additional manipulation, and practically all of the time and labor heretofore expended in assembling the various sections of a single set one by one in their proper places after and within others is

avoided. A very great saving of time and labor results from this method of imposition and assembling, as it is simply necessary for the bookbinder to turn one of the assembled sets end for end, as shown in Fig. 16, before assembling the duplicate sets, after which he will unite the sets, as by sewing, and divide them in the line a to produce the two finished unbound books B^2 and B^3 , each consisting of a consecutive series of pages (in this case pages 1 to 68) made up of consecutive single signatures comprising two complementary sets of single signatures, one set constituting one half of one set of double signatures and the other set constituting the complementary half of another set of double signatures.

Having described my invention, I claim—

1. A double signature, ready for binding, composed of two different series of pages, one series above the other, with one binding edge extending lengthwise such two series, the ends of the pages of one series abutting the same ends of the pages of the other series.
2. A double signature, ready for binding, composed of two different series of pages, one series above the other, with one binding edge extending lengthwise such two series, each series consecutively numbered, the ends of the pages of one series abutting the same ends of the pages of the other series.
3. A double signature, ready for binding, composed of two uninterrupted, oppositely-running series of consecutive pages, one series above the other, with one binding edge extending lengthwise such two series, the ends of the pages of one series abutting the same ends of the pages of the other series.
4. A double signature, ready for binding, composed of two discontinuous, uninterrupted series of consecutive pages, one series above the other with one binding edge extending lengthwise such two series, the ends of the pages of one series abutting the same ends of the pages of the other series.
5. A double signature, ready for binding, composed of an initial series and a final series of pages, one series above the other with one binding edge extending lengthwise such two series, the ends of the pages of one series abutting the same ends of the pages of the other series.
6. A parallel-fold double signature, ready for binding, composed of two different series of pages, one series above the other with one binding edge extending lengthwise such two series, the ends of the pages of one series abutting the same ends of the pages of the other series.
7. A parallel-fold double signature composed of two uninterrupted oppositely-running series of consecutive pages one end of the pages of one series abutting the same end of the pages of the other series.
8. A parallel-fold double signature comprising two discontinuous uninterrupted series of consecutive pages one end of the pages

of one series abutting the same end of the pages of the other series.

9. A double book comprising two united oppositely-disposed duplicate double signatures made up of two consecutive uninterrupted oppositely-running series of consecutive pages one end of the pages of one series abutting the same end of the pages of the other series.

10. A double book comprising two united oppositely-disposed duplicate sets of double signatures, said sets comprising two consecutive uninterrupted oppositely-running series of consecutive pages, one end of the pages of one series abutting the same end of the pages of the other series.

11. A printed sheet having its pages forming a parallel-fold signature composed of different series of consecutively-numbered pages, said series being disposed edge to edge one above another transversely to the binding edge of the signature.

12. A printed sheet having its pages forming a parallel-fold double signature composed of two different series of consecutively-numbered pages disposed one at one side and the other at the other side of the central transverse division-line of the double signature and transversely to the binding edge of said signature.

13. A parallel-fold double signature having three folds therein, the second and third of which are parallel to each other and transverse to the first fold, said signature being composed of two series of consecutively-numbered pages disposed one at one side and the other at the other side of the central transverse division-line of the double signature and transverse to the binding edge of said signature.

14. A parallel-fold double signature composed of two uninterrupted series of consecutive pages having the tops of the pages of one series facing the tops of the pages of the other series.

15. A parallel-fold double signature composed of two uninterrupted oppositely-running series of consecutive pages having the tops of the pages of one series facing the tops of the pages of the other series.

16. A parallel-fold double signature comprising two discontinuous uninterrupted series of consecutive pages having the tops of the pages of one series facing the tops of the pages of the other series.

17. A parallel-fold double signature composed of an initial series and a final series of consecutive pages, the tops of the pages of one series facing the tops of the pages of the other series.

18. A set of parallel-fold double signatures assembled in consecutive order and composed of two different series of consecutively-numbered pages disposed one at one side and the other at the other side of the central transverse division-line of the double signatures and transversely to the binding edges of said double signatures.

19. A set of parallel-fold double signatures assembled in consecutive order and composed of two consecutive series of consecutively-numbered pages disposed one at one side and the other at the other side of the central transverse division-line of the double signatures and transversely to the binding edges of said double signatures.

20. A set of gathered parallel-fold double signatures comprising two consecutive uninterrupted oppositely-running series of consecutive pages having the tops of the pages of one series facing the tops of the pages of the other series.

21. A double book comprising two united oppositely-disposed duplicate double signatures made up of two consecutive uninterrupted oppositely-running series of consecutive pages having the tops of the pages of one series facing the tops of the pages of the other series.

22. A double book comprising two united oppositely-disposed duplicate sets of double signatures, said sets comprising two consecutive uninterrupted oppositely-running series of consecutive pages having the tops of the pages of one series facing the tops of the pages of the other series.

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