No. 742,013. PATENTED OCT. 20, 1903.

E. A. A. DUNN.

FLEXIBLE RULER.

APPLICATION FILED APR. 20, 1903.

NO MODEL.

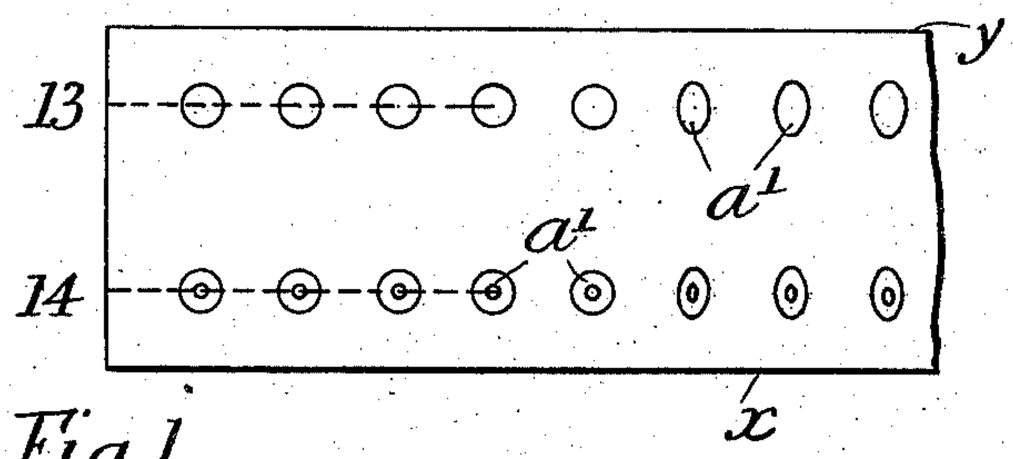


Fig. 1.

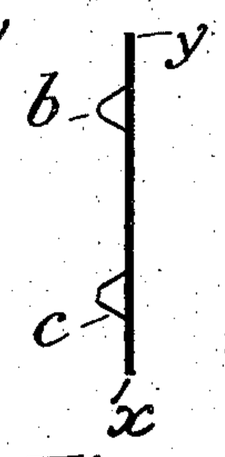


Fig. 2.

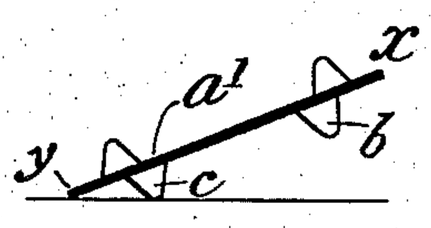


Fig. 3.

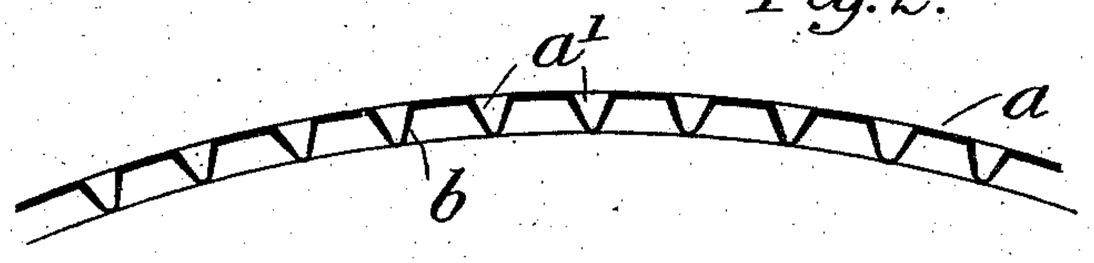


Fig. 4.

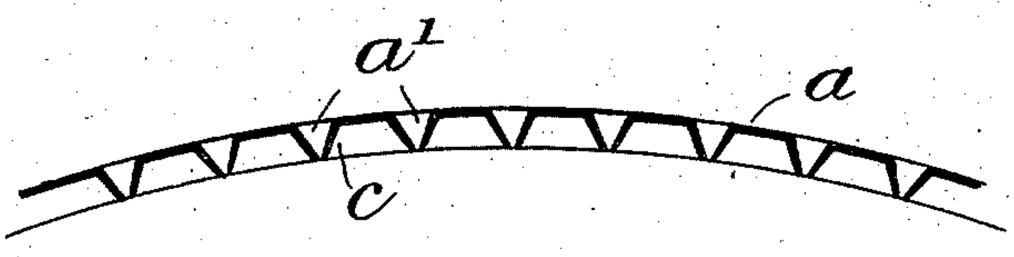
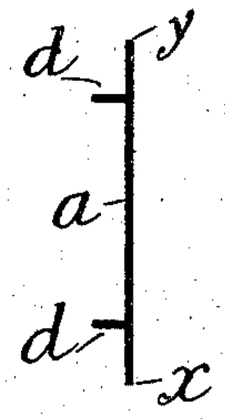


Fig. 5.

Fig. 6.



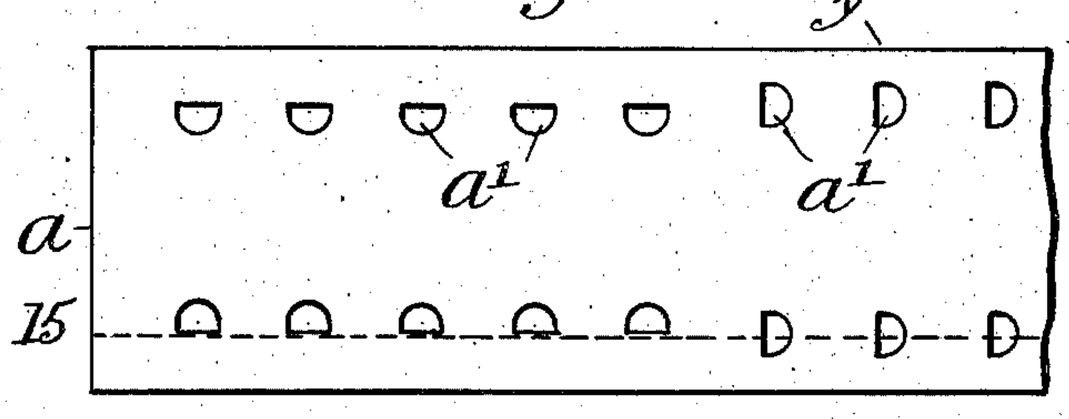


Fig. 7.

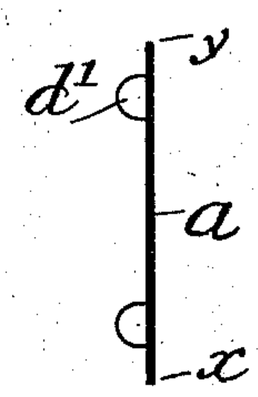


Fig. 8.

Fig. 9.

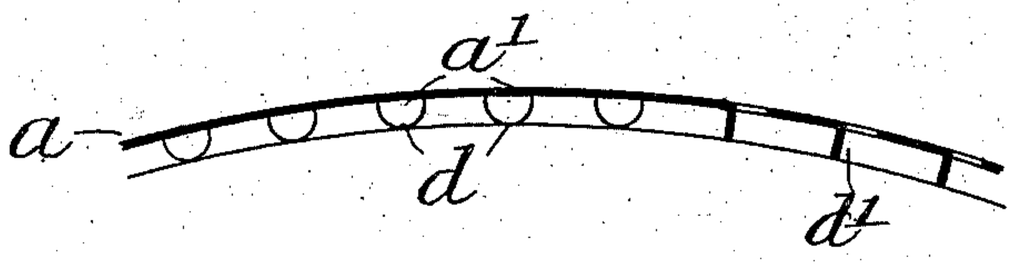
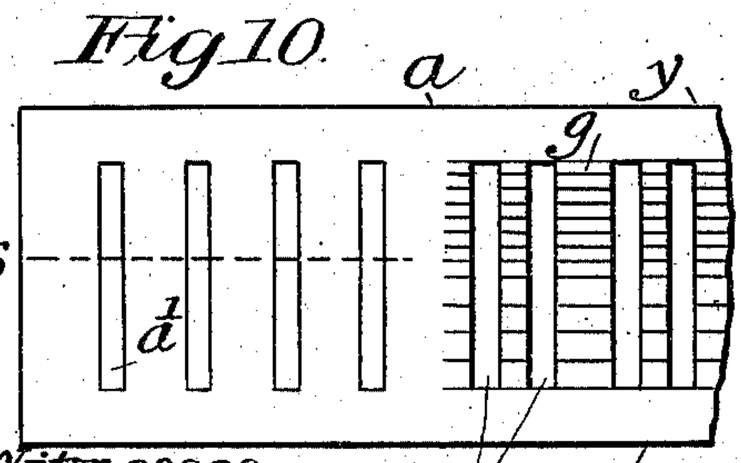


Fig 10.



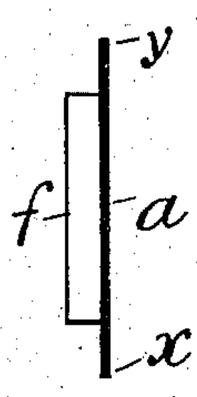
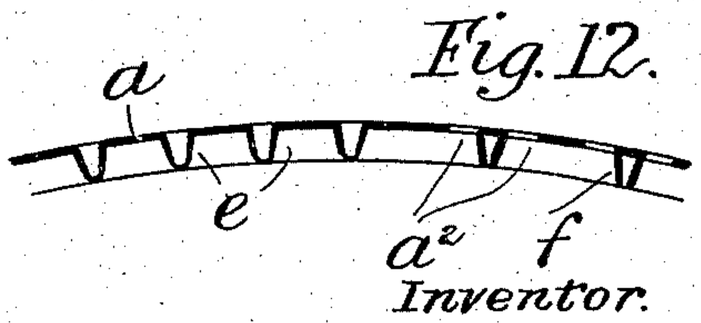


Fig. 11

Fig. 12.



Witnesses.

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Inventor.

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by Wilkinson & Fitch

his Attorneys.

No. 742,013. Patented October 20, 1903.

UNITED STATES PATENT OFFICE.

EUSTACE ALEXANDRIA ANDREW DUNN, OF BALLARAT, VICTORIA, AUSTRALIA.

FLEXIBLE RULER.

SPECIFICATION forming part of Letters Patent No. 742,013, dated October 20, 1903.

Application filed April 20, 1903. Serial No. 153,549. (No model.)

To all whom it may concern:

Be it known that I, EUSTACE ALEXANDRIA ANDREW DUNN, a subject of the King of Great Britain and Ireland, residing at 18[A] MacArthur street, Ballarat, in the State of Victoria, Australia, have invented certain new and useful Improvements in Flexible Rulers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to provide improvements in flexible rulers, to enable them to be produced extremely cheaply, yet possessing the advantages of lightness and strength, and of facilitating accurate and rapid positioning of the ruled lines. The latter advantage is due to the upper and lower antislipping means provided in the form of nipples, wings, flutings, corrugations, or ribs which, moreover, serve to raise the ruler edges to a convenient height to avoid blotting when ruling.

The improved ruler is made of a flexible sheet-metal or equivalent blank adapted to receive any desired advertisements and which is when ready for use springy, so as to automatically resume its normal straightness when not held curved. The simplest antislipping means I employ is a longitudinal double row of nipples formed by pressing the ruler-blank between dies, each row being parallel to and near an edge of the ruler, so that the upper face of the ruler will exhibit two series of pits or depressions and the lower face two series of projections, which I call in some cases "nipples," and which may be circular, oval, or of other convenient internal and external shape and terminate in pinholes or larger openings or be imperforate. The projections may, however, be caused by transverse corrugations or flutings (maintaining, however, the straightness of the ruler edges) or by cutting the blank and bending down the parts cut so as to produce wings or ribs projecting on the under side, leaving on the upper side openings or slits in the flexible blank or body.

This ruler may be placed upon the pages of an ordinary open ledger or the like having a curved surface or surfaces and by the pressure of the fingers of the left hand is easily held so that it cannot slip, which is not the case with the ordinary flexible rulers known to me which have not a proper provision for this purpose either on their upper or lower surfaces, while I provide both. The finger-pressure has with my invention the effect of causing the nipples, flutings, wings, or ribs to firmly grip the paper or like surface, even indenting the same very slightly, if desired, at predetermined points where the direct pressure is applied, while the fingers are prevented from slipping by reason of their being pressed into the pits, recesses, or openings on the upper face of the ruler. The apertures enable the ruler to be better adjusted in position and enable the paper beneath to be marked with lines or dots therethrough at predetermined distances from one another. These apertures have where desired their edges marked with a variety of scales, whereby the distances between the lines drawn may be regulated and varied extensively. Two downwardly-bent parts may also be inclined toward one another, so as to meet and form a single strong rib or wing.

Referring now to the drawings herewith, which show part of a flexible ruler constructed in accordance with this invention, Figure 1 is a plan view, Fig. 2 an end elevation, and Fig. 3 an end elevation showing the ruler tilted, one edge touching the paper or surface to be ruled and the other being high above said surface. This view shows projections on both sides of the ruler. Figs. 4 and 5 represent the ruler of Fig. 1 (in longitudinal vertical sections on the lines 13 and 14, respectively) as applied to a curved surface to be ruled. The nipples on line 13 are shown imperforate and those on line 14 perforated. Figs. 6 and 10 are plan views showing modifications of Fig. 1, and Figs. 7 and 8 are end elevations of Fig. 6. Fig. 9 represents the ruler in Fig. 6 in longitudinal vertical section on line 15. Fig. 11 is an end elevation of Fig. 10, and Fig. 12 shows the ruler in Fig. 10 in longitudinal vertical section on line 16.

In several of the figures more than one modification is shown to more fully illustrate the invention; but in practice the use of one

or of several types of projection on one ruler would depend upon the manufacturer.

Advertisements or calendars are not shown in the drawings, as such additions, though contemplated in practice, are not essential features.

Referring to the lettering on the drawings, the ruler is made from a blank *a*, having ruling edges, as *x* and *y*. *a'* on the upper face indicates openings or pits as interiors of the nipples *b* (imperforate) *c*, (perforated,) which project from the lower face, keeping the ruler edge at a convenient height above the paper to be ruled. In Figs. 6 to 12 these openings or pits (some of which are of elongated form) are shown as produced by cutting and bending the metal or by (see left-hand side of Fig. 10) corrugating or fluting it, and two of these elongated openings, which extend at right angles to the edges *x y*, are marked a^2, the parts bent down from their areas being brought obliquely together to form a transverse rib *f*. The bent-down projection marked *d* is parallel to the edges *x y*, while *d'* is transverse thereto. Two projections *d* or *d'* may be brought together, as in the case of *f*, for greater strength. *e* shows the projection when there are transverse flutings or corrugations, this and other details varying as desired from the drawings in proportions, positions, and general "finish," but maintaining features essential to the invention. As it is customary to apply scales to the edges of rulers, these, though they may be employed, form no part of the invention. In Fig. 10, however, a series of longitudinal lines *g* (made in practice to any desired scalings) is shown crossing the openings a^2. These are to facilitate ruling lines which could not be so readily positioned or arrived at if the ruler were not provided with the scale-marked openings, any desired numbering or the like opposite the lines *g* being added in practice. Beveled or rounded edges or surfaces and other such details as will not impair the flexibility are provided at will.

When the ruler edges must be elevated from the paper, whichever side is uppermost suitable projections will be made on both sides of the flexible body *a*. Fig. 3 shows such projections, the rows projecting on the upper side being drawn slightly nearer the edge than those on the lower. It is to be understood that the nipples may have their pits partly filled or filled with rubber or other suitable material if a head is left which will be antislipping to fingers pressed thereon.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. A flexible ruler composed of a single flat piece of flexible material provided with a series of projections on its under side formed by forcing downward a part of the body portion of the ruler, substantially as described.

2. A flexible ruler composed of a single flat piece of flexible material provided with a plurality of holes on its upper side and with a series of projections on its under side, formed by forcing a part of the body portion of the ruler downward, substantially as described.

3. A flexible ruler composed of a single flat plate of flexible material provided with a series of transversely-arranged depressions on its upper side and with a series of transversely-arranged projections on its lower side, said depressions and projections being formed by forcing downward portions of the body part of the ruler, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EUSTACE ALEXANDRIA ANDREW DUNN.

Witnesses:
AND. SMITH,
H. G. MORROW.