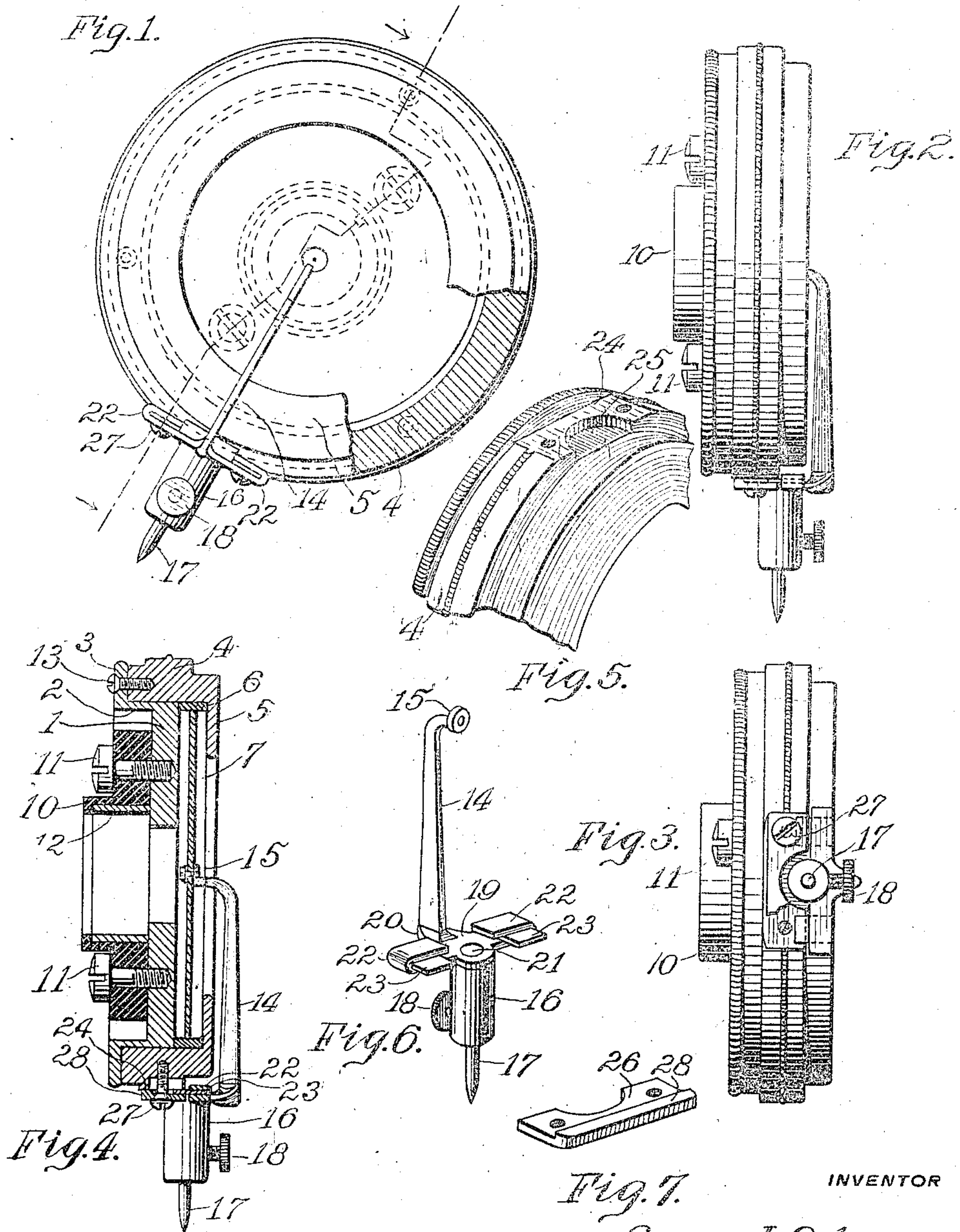


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SOUND BOX.

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946,015.

Patented Jan. 11, 1910.



WITNESSES

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## SOUND-BOX.

946,015.

Specification of Letters Patent.

Patented Jan. 11, 1910.

Application filed September 12, 1907. Serial No. 392,443.

*To all whom it may concern:*

Be it known that I, GEORGE L. COLEMAN, a citizen of the United States, and a resident of the city of Camden, county of Camden, and State of New Jersey, have invented certain new and useful Improvements in Sound-Boxes, of which the following is a full, complete, and exact description.

The main objects of my invention are to simplify the construction of the sound box; with a view to rendering the parts readily removable and replaceable; to so design and combine the parts as to form a compact, neat and durable construction; to provide an improved mounting for the diaphragm; to provide means for preventing injury to the diaphragm; to provide an improved stylus bar mounting; to provide an improved yielding mounting for the box; and to provide other improvements which will appear as the invention is further disclosed.

In the accompanying drawings: Figure 1 is a front elevation of a sound box constructed in accordance with this invention; Fig. 2 a side elevation of the same; Fig. 3 a bottom plan view of the same; Fig. 4 a longitudinal section of the same upon line 4-4 of Fig. 1 looking in the direction of the arrows; Fig. 5 a fragmentary perspective upon an enlarged scale of one side of the sound box casing; Fig. 6 a perspective in detail of the stylus bar; and Fig. 7 a perspective in detail of the plate for securing the stylus bar to the box.

Referring to the drawings, the device comprises a casing consisting of a flat annular plate 1, provided at its outer periphery with a rearwardly extending cylindrical flange 2, integral therewith and having upon its rear edge an outwardly extending flat annular flange 3, the flanges forming a recess for the reception of the inner edge of a cylindrical cap or cover 4 having upon its front edge an inwardly extending annular flange 5, forming the face of the box.

In an internal groove between the front of the plate 1 and the inner surface of the flanged cover 4 carried thereby, is a cylindrical ring 6, which forms a mounting for the diaphragm 7. The ring 6 is substantially rectangular in cross section, and equal in width and outside diameter to the width and diameter of the said groove.

The circular plate 1 forming the rear side of the sound box is provided, concentric with its central aperture, with a yielding tubular extension 10, of soft rubber or other suitable material, secured to the rear face of the plate by means of the screws 11. This tubular extension has its outer end reduced in outside diameter, and has within its bore a non-yielding bushing or lining 12 of brass or similar material, and is adapted to be secured over a sound conducting arm for transmitting the sound waves from the diaphragm to the usual amplifier.

The front and rear portions of the sound box casing are held together by means of screws 13 extending longitudinally of the box through the outwardly extending flange of the rear plate of the box, and into the rear face of the cylindrical cap forming the sides and front of the box.

The stylus bar has a flat tapering inner portion 14, and the bar is phonetically connected at its inner end 15 of the diaphragm. The outer portion 16 of the stylus bar is offset rearwardly from the inner portion, is cylindrical in shape, and has a central longitudinal socket for the reception of a needle 17, which is held in place by a thumb screw 18.

The inner and outer portions of the stylus bar are connected by means of a plate 19 which is substantially uniform in thickness, and which has the front side thereof bent inwardly away from the plane of the other side, and extending in a direction substantially oblique to the flat portion of the bar, and is slotted to receive the outer end of said portion, which is soldered or otherwise secured in position. The rear side of this plate which is semi-circular in shape and in a plane perpendicular to the outer end of the bar, is provided with a circular opening into which is riveted the reduced inner end of the said outer end of the bar, the outer surface of the plate resting against the shoulder of the bar formed by the reduced end. This plate 19 is further provided with lateral extensions 22, projecting oppositely in a direction parallel to the diaphragm, the inner edges of these projections being in the same straight line, substantially in alignment with the diaphragm. The outer ends of these projections are folded inwardly,



and clasped in each end is a flat yielding connection 23, of metal or other material, and preferably resilient, whereby the stylus bar is supported upon the casing of the box, these connections being secured rigidly to the extensions of the bar by sweating, or any other suitable process. Although I prefer to use thin flat tempered steel springs for these connections 23 supporting the stylus bar, yet I do not limit myself to this particular kind of material, as I have found that a very good reproduction of sound may be obtained when soft copper cylindrical wires are used instead of the steel spring, thus showing that any yielding connection, whether resilient or not, will produce good results when used in this form of stylus bar.

The inner ends of the yielding connections rest upon a flattened surface 24 of the side of the sound box casing. This flattened surface is provided with a semi-circular recess 25 for the reception of the inner half of the inner end of the cylindrical portion of the stylus bar so as to permit the bar to vibrate without touching against the casing. The yielding connections supporting the bar are held in place upon this flat surface by means of the plate 26 which is secured over the connections by means of the screws 27 passing through the plate and into the sound box casing, the inner edge of the plate being provided with a rib 28 substantially equal in thickness to the thickness of the connections, the inner surface of the rib resting upon the flattened surface of the box, so that the inner surface of the plate will remain parallel with the flattened surface of the box and will tightly hold the inner ends of the connections against the flattened surface of the casing.

The arrangement of the stylus bar with respect to the sound box casing is such that the longitudinal axis of the stylus bar socket and the axis of oscillation of the stylus bar are substantially in the plane of the diaphragm, consequently the vibrations of the upper end of the stylus bar connected to the diaphragm will be in a line normal to the diaphragm, and will have, therefore, no tendency to buckle the diaphragm, as would be the case were the axis of oscillation of the bar not in the plane of the diaphragm.

With this construction in mind, it is evident that I have provided a sound box of simple, durable construction, in which the parts are readily removable, and in which the stylus is so constructed and arranged as to reproduce with extreme sensitiveness, and with great faithfulness, the sound waves traced upon the record.

While I have shown this invention only as embodied in a single form, yet it is obvious that various modifications might be made in the form and construction of this device within the scope of the appended claims,

without departing from the spirit of this invention or sacrificing any of the advantages thereof.

Having thus fully described my invention, what I claim and desire to protect by Letters Patent is:

1. In a sound box, the combination with a casing comprising two separate parts forming an annular internal groove, of a diaphragm, and an annular mounting for said diaphragm in said groove, said mounting being substantially rectangular in cross section and being equal in width and diameter to the width and diameter of said groove.

2. In a sound box, the combination with a casing, of a yielding tubular extension secured to the rear side thereof, and provided with an internal annular recess and a non-yielding lining in said recess.

3. In a sound box, the combination with a casing, of a yielding tubular extension secured to the rear side of said casing, and a non-yielding lining in said recess, the inner edge of said lining being in contact with the rear side of said casing.

4. In a sound box, the combination with a casing, of a yielding tubular extension secured to the rear side of the said casing, and a non-yielding lining within said extension, the rear edge of said lining being spaced inwardly from the rear edge of said extension.

5. In a sound box, the combination with a casing, of a yielding tubular extension secured to the rear side of the said casing, and a non-yielding lining within said extension, the rear edge of said lining being spaced inwardly from the rear edge of said extension, and the inner surface of said lining being flush with the inner surface of the portion of the yielding extension which is in the rear of the rear edge of said lining.

6. In a sound box, the combination with a casing, of a yielding tubular extension secured to the rear side of said casing, and a non-yielding lining within said extension, the inner edge of said lining being in contact with the rear side of said casing and the rear edge of the said lining being spaced inwardly from the rear edge of the said extension.

7. In a sound box, the combination with a casing, of a yielding tubular extension secured to the rear side of the said casing and having a reduced outer end and non-yielding lining for said extension spaced inwardly from the outer edge of said reduced end, the inner surface of said reduced end and said lining being substantially flush.

8. In a sound box, the combination with a casing, of a yielding tubular extension secured to the rear side of the casing and having its outer end reduced in outside diameter.



9. In a sound box, the combination with a casing, of a yielding tubular extension secured to the rear side of the casing and having its outer end reduced in outside diameter, and a non-yielding lining covering part of the inner surface of said extension, the inner surface of said lining being flush with the inner surface of the outer end of said extension.

10. In a sound box, the combination with a flat annular plate provided with a rearwardly extending flange at its periphery terminating in an outwardly extending flat flange, of a cap secured over the periphery of said plate and in the space between said flanges, a yielding tubular extension secured to the rear side of said annular plate concentric therewith and provided with an internal annular recess, and a non-yielding lining in said tubular extension.

11. In a sound box, a stylus bar provided with lateral extensions terminating in folded ends and yielding supports for said bar secured in the folds of said extensions.

12. In a sound box, a stylus bar, lateral extensions upon said bar terminated in folded ends and resilient supports for said bar secured in the folds of said ends.

13. In a sound box, a stylus bar comprising an inner portion, an outer portion offset from said inner portion, an intermediate portion connecting said inner and outer portions, said intermediate portion being provided with lateral extensions terminating in folded ends, and yielding supports for said stylus bar secured between the folds of said ends.

14. In a sound box, a stylus bar comprising an inner flat tapering portion, an outer cylindrical portion provided axially with a stylus socket and an intermediate portion connecting said inner and outer portions, said intermediate portion having a side turned inwardly and slotted to receive the outer end of said inner portion.

15. In a sound box, a stylus bar comprising an inner portion, an outer portion and an intermediate portion, said outer portion being off-set from said inner portion and said intermediate portion being provided with an up-turned slotted portion to receive the outer end of said inner portion and with an aperture to receive the inner end of said outer portion.

16. In a sound box, a stylus bar comprising an inner portion, an outer portion, and an intermediate portion, said outer portion being offset from said inner portion, the central part of said intermediate portion being substantially flat, and being provided with oppositely extending lateral projections terminating in folded ends, and yielding supports for said stylus bar secured between the folds of said ends.

17. In a sound box, a stylus bar comprising

an inner portion, a cylindrical outer portion provided with a stylus socket, and an intermediate portion, said intermediate portion having a substantially flat central portion of semi-circular shape upon one side conforming to the cylindrical lower portion of the bar, and being provided on its opposite side with a bent slotted projection to receive the end of the inner portion of said bar, said intermediate portion being further provided with oppositely extending lateral projections terminating in folded ends, and yielding supports for said bar secured between the folds of said ends.

18. In a sound box, the combination with a casing having a flattened side, of a stylus bar, a yielding support for said bar, one end of said support resting upon the said flattened side, a plate resting upon the outer surface of said yielding support, and means to force said plate upon said yielding support to hold the same against said sound box casing, said plate being provided on one edge with a rib of substantially the same thickness as the thickness of the end of said yielding support, whereby the inner surface of the plate is retained in a plane parallel to the flattened surface of the sound box casing.

19. In a sound box, the combination with a casing having a flattened side provided with a semi-circular recess, of a stylus bar having a cylindrical outer end offset from the inner end of said bar, said outer end projecting into said semi-circular recess but being spaced from the surface thereof, spaced yielding supports for said stylus bar, the inner ends of said yielding supports resting respectively upon the flat side of said sound box casing upon opposite sides of the semi-circular recess, a flat plate provided with a semi-circular recess on one edge, and with a rib upon the opposite edge, and means for holding said flat plate against said sound box casing, and against the ends of said yielding supports to retain said yielding supports in position.

20. In a sound box, the combination with an annular plate provided with a rearwardly extending flange forming a recess in the rear face of the box, of a yielding tubular extension secured in said recess.

21. In a sound box, a stylus bar comprising an inner portion and an outer portion offset therefrom, and an intermediate portion of substantially uniform thickness connecting said inner and outer portions, said intermediate portion having one side turned away from the plane of the other side and slotted to receive the end of one of said other portions.

22. A stylus bar comprising an inner portion and an outer portion offset therefrom, and an intermediate portion, said intermediate portion having one side turned away



from the plane of the other side and slotted to receive one end of one of said first mentioned portions, and having its other side apertured to receive one end of the other 5 of said first mentioned portions.

23. A stylus bar comprising two portions offset from each other, and an intermediate portion connecting said first mentioned portions, said intermediate portion having one 10 side substantially oblique to one of said offset portions.

24. A stylus bar comprising two portions offset from each other, and a plate connecting said portions, said plate having one side 15 substantially oblique to one of said portions, and being slotted to receive the same.

25. A stylus bar comprising two portions off-set from each other, and a plate connecting said portions, said plate having one side 20 substantially oblique to one of said portions.

26. In a sound box, a stylus bar comprising an inner portion, an outer portion and an intermediate portion, said inner portion being provided upon one side with a bent and

slotted projection to receive the end of the 25 inner portion of said bar.

27. In a sound box, a stylus bar comprising an inner portion, an outer portion provided with a stylus socket and an intermediate portion connecting said inner and 30 outer portions, said intermediate portion having a side turned inwardly to receive the outer end of said inner portion.

28. In a sound box, a stylus bar comprising two portions, and an intermediate portion, said intermediate portion having one 35 side bent and slotted to receive one end of one of said first mentioned portions.

29. In a sound box, the combination with a casing, of a yielding tubular extension 40 therefor, and a non-yielding lining for said extension, said lining having a smooth cylindrical external surface.

GEORGE L. COLEMAN

Witnesses:

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