United States Patent

Lyon

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[45] **July 18, 1972**

[54] DEVICE FOR EXTRACTING MOUTHPIECES FROM MUSICAL INSTRUMENTS

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[52] **U.S. Cl.** **84/453,** 81/302

[51] **Int. Cl.** **G10g 7/00,** B25b 7/12

[58] **Field of Search** 84/458, 453; 81/5.1, 302; 29/237, 272

[56] **References Cited**

UNITED STATES PATENTS

1,465,905	8/1923	Hoff	81/302 X
717,526	1/1903	Barney	81/302
949,905	2/1910	Knurr	84/458 UX
2,222,744	11/1940	Gallien	81/302

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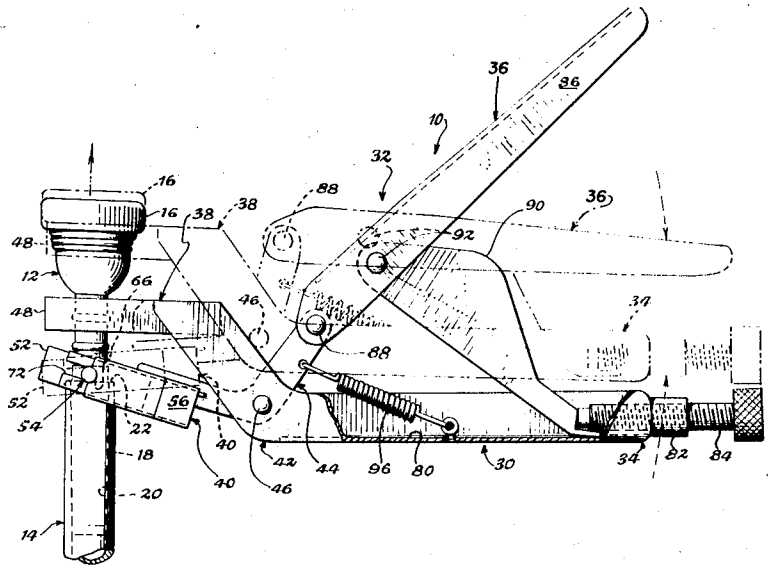
Assistant Examiner—John F. Gonzales

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[57] **ABSTRACT**

A device for extracting differently sized mouthpieces, which have become stuck in brass type musical instruments, wherein the mouthpieces are characterized as having a mouth end portion and a reduced diameter stem end portion dimensioned to be slip-friction fitted into an end of the musical instrument. The device includes a pair of pivotally joined lever devices, each having jaw end portions and operating end portions, the latter when moved towards one another forcing the jaw end portions to move apart for the purpose of extracting the mouthpiece from the instrument. One of the jaw end portions is configured to freely receive the stem end portion and engage beneath the mouthpiece end portion, whereas the other jaw end portion carries a pair of spreader members, which serve to removably grip the stem end portion and bear against an end surface of the instrument. The spreader members are automatically adjustable relative to their associated jaw end portion in order to prevent binding of the stem end portion within the instrument during the extraction operation.

10 Claims, 4 Drawing Figures



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Fig. 1.

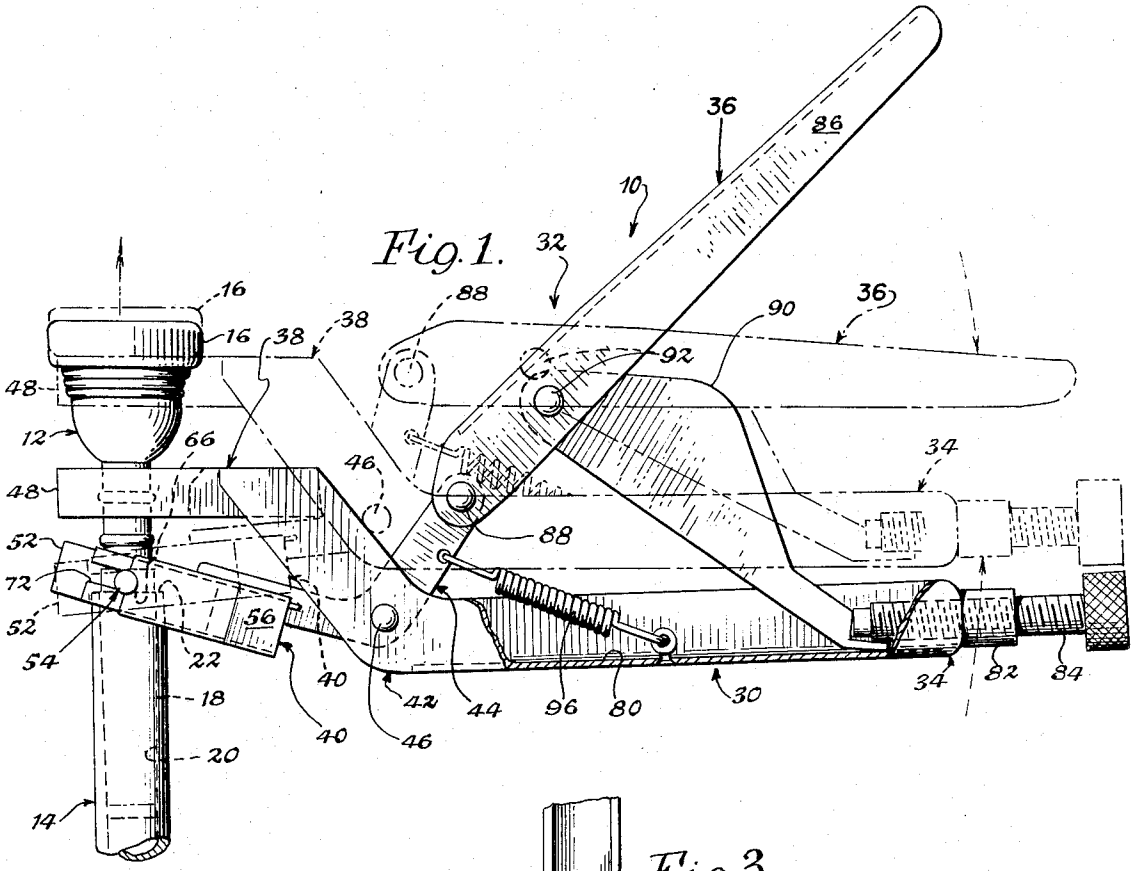


Fig. 2.

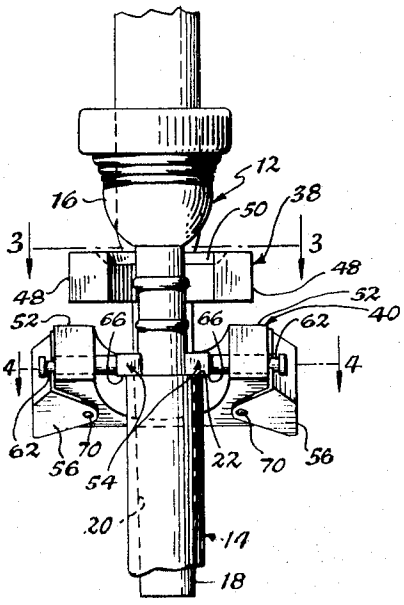


Fig. 3.

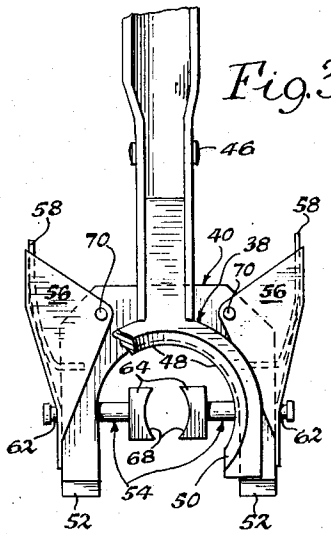
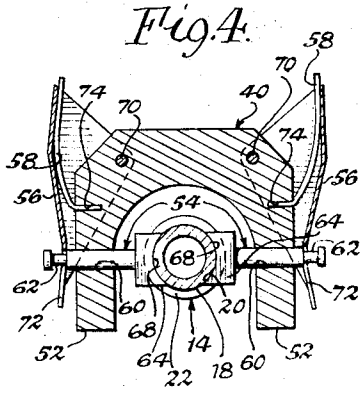


Fig. 4.



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DEVICE FOR EXTRACTING MOUTHPIECES FROM MUSICAL INSTRUMENTS

SUMMARY OF THE INVENTION

The present invention relates to a device for removing a mouthpiece which has become accidentally stuck within a musical instrument, and more particularly to a simple, relatively inexpensive hand tool, which may be employed to extract mouthpieces from brass instruments, wherein the mouthpiece is characterized as having a mouth end portion and a reduced diameter stem end portion dimensioned to be slip-friction fitted into an end of the instrument.

The extraction device of the present invention includes first and second lever devices each having a jaw end portion, an intermediate portion and an operating end portion; and means for joining the intermediate portions whereby when the operating end portions are moved toward one another the jaw end portions are forced apart for the purpose of extracting the mouthpiece from the instrument. One of the jaw end portions is of fork-like configuration having spaced arm portions contoured to define an engaging surface or seat for receipt of the bottom surface of the mouth end portion. The other jaw end portion, which is also of fork-like configuration, additionally has the arm members thereof provided with aligned through openings to freely receive a pair of spreader or gripper members for both reciprocating and rotational movement about an axis arranged substantially parallel to the axis about which the lever devices are pivotally joined. Means in the form of a pair of manually operated spring biased devices carried one on each of the arm members are provided for the purpose of releasably maintaining the spreader members in engagement with the stem end portion for engagement with an end surface of the instrument.

By supporting the spreader members in the manner described, the device may accommodate different sizes of mouthpieces. Further, the extracting force, which is applied by the arm portions against the mouth end portion and by the spreader members against the end surface of the instrument, is maintained in alignment with the axis of the stem end portion and the end of the instrument in order to prevent binding during the extraction operation.

DRAWINGS

The nature and mode of the present invention will now be more fully described in the following detailed description taken with the accompanying drawings wherein:

FIG. 1 is a side view of the device of the present invention showing in full and phantom line its applied and mouth piece extraction positions, respectively;

FIG. 2 is an end view of the device shown in FIG. 1;

FIG. 3 is a sectional view taken generally along line 3—3 of FIG. 2; and

FIG. 4 is a sectional view taken generally along line 4—4 of FIG. 2.

DETAILED DESCRIPTION

Reference is now made to FIG. 1, wherein the mouthpiece extracting device of the present invention, which is generally designated at **10**, is shown as being employed to extract mouthpiece **12** from the tubular end portion **14** of a brass type musical instrument, such as a trumpet, not shown.

For the purpose of illustration only, mouthpiece **12** will be considered to include a "bell" shaped mouth end portion **16** and a reduced diameter stem end portion **18**; the latter being dimensioned to be slip-fitted into an opening **20** extending through end surface **22** of instrument end portion **14**. Normally, one or both of stem end portion **18** and opening **20** are slightly tapered in order to provide for friction fitting and the establishment of a good air seal between such parts.

Extraction device **10** is best shown in FIG. 1 as including first and second lever devices **30** and **32**, which include operating end portions **34** and **36**, jaw end portions **38** and **40**, and intermediate portions **42** and **44**, respectively. As will be

apparent, intermediate portions **42** and **44** are pivotally joined by a suitable pin shaft **46**, such that when operating and portions **34** and **36** are moved towards one another, as by being "squeezed" by the hand of a user, jaw end portions **38** and **40** are forced apart for the purpose of extracting mouthpiece **12** from instrument end portion **14**.

Jaw end portion **38** is preferably of fork-like configuration, wherein a pair of arm portions **48** cooperate to define an annular, beveled seat or surface **50** for accommodating the lower surface of mouth end portion **16**. It will be understood that arm portions **48** are spaced apart sufficiently to freely accommodate therebetween the maximum diameter stem end portion of the size range of mouthpieces for which the present device is designed for use.

Jaw end portion **40** is also preferably of fork-like configuration, wherein a pair of arm members **52**, as in the case of arm portions **48**, are spaced apart sufficiently to accommodate the maximum size mouthpiece for which the device is designed. In accordance with the present invention, jaw end portion **40** further includes spreader means in the form of a pair of spreader or gripper members **54**, and means in the form of a pair of manual operating members **56** and a pair of leaf springs **58** for releasably maintaining spreader members **54** in engagement with stem end portion **18** when positioned therebetween.

Members **54** are freely supported within axially aligned arm member, bore openings **60** for both reciprocating and rotational movement about an axis disposed substantially parallel to the axis of pin shaft **46**, and are provided adjacent opposite ends thereof with annular grooves **62** and head enlargements **64**. Head enlargements **64** are best shown in FIGS. **2** and **4** as being formed with planar bearing surfaces **66**, which are adapted to engage instrument end surface **22** and facing, concave gripping surfaces **68**, which are adapted to be removably biased into engagement with opposite sides of stem end portion **18**. **54**

Operating members **56** are shown in the drawings as being of generally U-shaped construction and as being mounted in a straddling relationship and for pivotal movement relative to arm members **52** by means of a pin shaft **70**. Further, as best shown in FIGS. **1** and **4**, operating members **56** are formed adjacent one end thereof with slot openings **72**, which cooperate with annular grooves **62** to provide a loose fitting connection between the operator members and members **54**. Spring members **58** are in turn fitted within openings **74** formed in arm members **52** and arranged to bear against operating members **56**, so as to normally bias the latter and thus gripping members **56**, so as to normally into the position illustrated in FIG. **3**. As will be apparent, a user may reciprocate gripping members **54** in opposite directions against the bias of springs **58** in order to permit stem end portion **18** to be positioned between gripping surfaces **68** by merely employing his thumb and index finger to "squeeze together" operating members **56** at ends thereof remote from slot openings **72**. When "sqeezing" pressure on the operating members is released to permit engagement of gripping surfaces **68** with the stem end portion, the gripping surfaces serve to position and maintain bearing surfaces **66** in a substantially co-planar relationship.

Again referring to FIG. **1**, it will be seen that operating end portion **34** is provided with a lengthwise extending upwardly opening slot recess **80**, and is contoured adjacent its free end, as at **82**, so as to threadably support a screw adjustment device **84** for movement lengthwise within slot opening **80**. Also, in FIG. **1** operating end portion **36** is shown as including a handle portion **86**, which is pivotally joined by a pin shaft **88** to intermediate portion **44**; and a link portion **90**, which is pivotally joined adjacent one end thereof to handle portion **86** by pin shaft **92**. The other end of link **90** is slideably received within slot recess **80** for positional engagement with the inwardly extending end of screw adjustment device **84**. The axes of pin shafts **88** and **92** are arranged substantially parallel to pin shaft **46**. Thus, it will be apparent that with the lever arrangement illustrated adjustment of screw device **84** inwardly of slot **80**, or to the left as viewed in FIG. **1**, serves to initially rotate handle

portion **86** in a counter-clockwise direction about pin shaft **88**, also as viewed in FIG. **1**. This in turn serves to increase the distance through which jaw end portions **38** and **40** are moved apart when operating end portions **34** and **36** are "squeezed" together during the extracting operation.

The device thus far described is completed by the provision of a tension spring device **96** whose opposite ends are connected respectively to operating end portion **34** and intermediate portion **44**. Spring device **96** serves to return the elements of the device to their full line positions illustrated in FIG. **1** after "squeezing" pressure has been removed from operating end portions **34** and **36**.

When a mouthpiece extracting operation is to be performed, a user would normally employ one hand to support the instrument, while using his other hand to simultaneously position arm portions **38** and arm members **40** about stem end portion **18** and "squeeze" operating members **56** to permit passage of the stem end portion to position between gripping surfaces **68**. Preferably, when the operating members are released to permit gripping of the stem end portion between the gripping surfaces, the device is arranged in the full line position illustrated in FIG. **1**, wherein bearing surfaces **66** are arranged in abutting engagement with surface **22**. Thereafter, the mouthpiece may be extracted by "squeezing" together handle portion **86** and operating end portion **34** to effect movement of the elements of the device into the phantom line position shown in FIG. **1**. It will be apparent that during this operation, seat **50** is moved upwardly into engagement with the lower surface of mouth end portion **16**; gripping members **54** being free to pivot relative to arm members **52** in order to maintain bearing surfaces **66** substantially parallel to the plane of seat **50**. This insures proper seating of the mouth end portion within the seat in order to avoid scratching of the former, and serves to subsequently maintain the extracting force aligned with the stem end portion in order to avoid bending of the latter. After extraction, the mouthpiece may be removed from the device by "squeezing" the operating members or by merely pulling the stem end portion in an axial direction from between the gripping surfaces.

Alternatively, the device may be applied by first seating the mouth end portion within the seat and thereafter "squeezing" the operating end portions to force the gripping members to slide downwardly along the stem end portion into engagement within surface **22**. This latter procedure is, however, not recommended, since it may result in scratching of the mouthpiece.

I claim:

1. A device for extracting differently sized mouthpieces from musical instruments, each said mouthpiece being characterized as having a mouth end portion and a reduced diameter stem end portion dimensioned to be slip-friction fitted into an end of said instrument, said device comprising in combination:

a first lever device, said first lever device having a first jaw end portion having surface means for engaging beneath said mouth end portion radially of said stem end portion a first operating end portion and a first intermediate portion, said first jaw end portion being non-movably fixed to said first intermediate portion;

a second lever device, said second lever device having a second jaw end portion having surface means for engaging a surface of said end of said instrument radially of said stem end portion, a second operating end portion and a second intermediate portion, said second jaw end portion being non-movably fixed to said second intermediate portion; and

a single hinge pin for pivotally joining said intermediate portions whereby when said operating end portions are moved towards one another said jaw end portions are forced to move apart along an arcuate path to position said surface means thereof in engagement with said mouth end portion and said instrument surface and to subsequently pull said stem end portion from said end of said instrument, one of said jaw end portions being characterized as having said surface means thereof supported thereon for independent pivotal movement relative thereto and the other of said jaw end portions about an axis arranged substantially parallel to an axis about which said lever devices are pivotally joined.

2. A device according to claim **1**, wherein said movably supported surface means includes a pair of members and means to releasably maintain said members in engagement with said stem end portion.

3. A device for extracting differently sized mouthpieces from musical instruments, each said mouthpiece being characterized as having a mouth end portion and a reduced diameter stem end portion dimensioned to be slip-friction fitted into an end of said instrument, said device comprising in combination:

first and second lever devices each having a jaw end portion, and intermediate portion and an operating end portion;

means for pivotally joining said intermediate portions whereby when said operating end portions are moved towards one another said jaw end portions are forced apart, one of said jaw end portions being of fork-like configuration and having spaced arm portions arranged to freely straddle said stem end portion and engage beneath said mouth end portion;

spreader means carried by another of said jaw end portions for independent movement about an axis arranged substantially parallel to an axis about which said lever devices are pivotally joined; and

means for releasably maintaining said spreader means in engagement with said stem end portion for engagement with an end surface of said end of said instrument, whereby when said arm portions are positioned to straddle and said spreader means are positioned to engage said stem end portion and said jaw end portions are forced apart, said arm portions and said spreader means are brought into engagement with said mouth end portion and said end surface of said instrument, respectively, and said stem end portion subsequently withdrawn from said end of said instrument.

4. A device according to claim **3**, wherein said means for releasably maintaining said spreader means in engagement with said stem end portion includes spring means tending to bias said spreader means into engagement with said stem end portion and manually operated means for removing said spreader means from engagement with said stem end portion against the bias of said spring means.

5. A device according to claim **3**, wherein said spreader means includes a pair of relatively aligned members slideably and rotatably supported by said other jaw end portion, and said means for releasably maintaining said spreader means in engagement with said stem end portion includes spring means tending to bias facing ends of said members towards one another for engagement with said stem end portion when disposed therebetween and manually operated means for moving said facing ends apart against the bias of said spring means.

6. A device according to claim **3**, wherein said other jaw end portion is of fork-like configuration having arm members thereof spaced apart to freely accommodate said stem end portion therebetween, said arm members having axially aligned openings therethrough;

said spreader means includes a pair of gripper members supported one within each of said arm member openings for both rotary and reciprocating movement therewithin, said gripper members having concave gripping surfaces on facing ends thereof and bearing surfaces arranged substantially normal to said gripping surfaces; and

said means for releasably maintaining said spreader means in engagement with said stem end portion includes a pair of manual operating members pivotally supported one on each of said arm members and loosely connected one to each of said gripper members whereby said gripper members are forced to reciprocate in opposite directions when

said operating members are relatively pivoted, and spring means tending to reciprocate said gripper members towards one another whereby to place said gripping surfaces in engagement with said stem end portion, said gripping surfaces when engaged tending to maintain said bearing surfaces in a coplanar relationship for engagement with said end surface of said instrument.

7. A device according to claim 6, wherein said spring means includes a pair of leaf springs carried one on each of said arm members for engagement with an associated operating member.

8. A device according to claim 7, wherein said operating end portions include means adjustable to vary the distance through which said jaw end portions are forced apart when said operating end portions are moved towards one another.

9. A device according to claim 8, wherein said operating end portion of said first lever device having said one jaw end portion includes a slot opening extending lengthwise thereof and a screw device threadably supported for movement lengthwise within said slot opening, and said operating end portion of said second lever device having said other jaw end portion includes a handle portion pivotally joined to said intermediate portion of said second lever device for movement about an axis arranged parallel to said pivot axis and a second link, said second link having one end portion supported by said handle portion for pivotal movement about an axis disposed parallel to said pivot axis and having a second end portion slidably received within said slot opening for positioning engagement by said screw device.

10. A device according to claim 9, wherein there is also provided in combination a tension spring device, said spring device having opposite ends thereof connected to said operating end portion of said first lever device and to said intermediate portion of said second lever device.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,677,129 Dated July 18, 1972

Inventor(s) Archie L. Lyon

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 36, after "18", cancel "54"; line 48, "56" should read -- 54 -- .

Signed and sealed this 19th day of December 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334.

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