

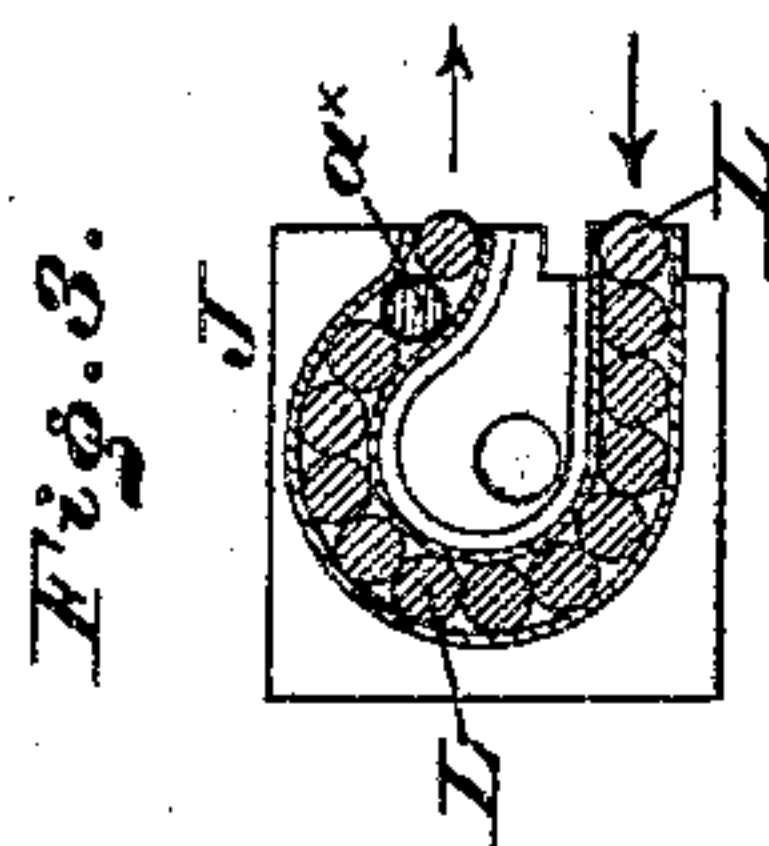
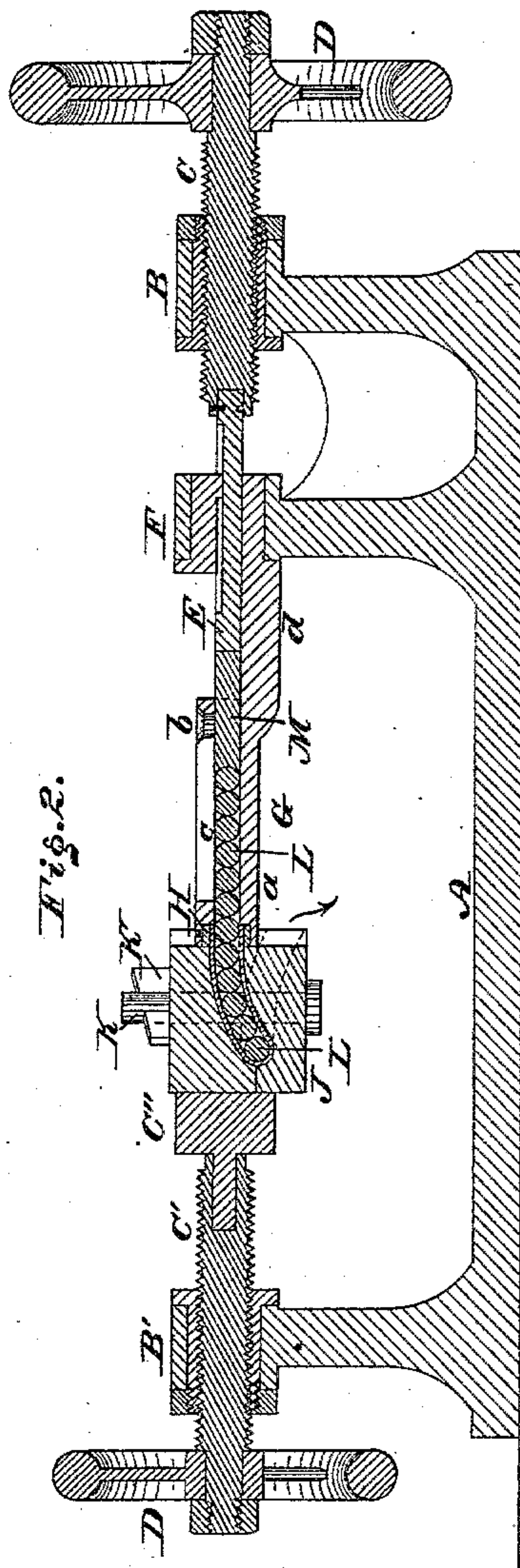
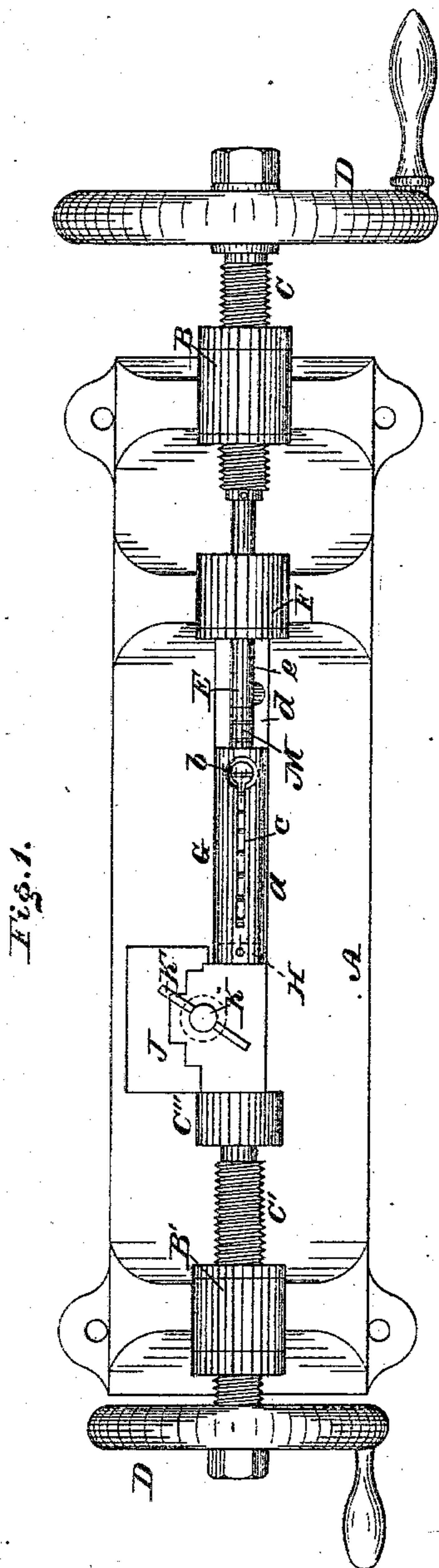
(No Model.)

H. DISTIN.

MANUFACTURE OF MUSICAL INSTRUMENTS.

No. 286,398.

Patented Oct. 9, 1883.



WITNESSES:

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MANUFACTURE OF MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 286,398, dated October 9, 1883.

Application filed October 30, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY DISTIN, of the city and county of Philadelphia, State of Pennsylvania, a subject of Great Britain, having resided one year last past within the United States, and made oath of my intention to become a citizen thereof, have invented a new and useful Improvement in the Manufacture of Musical Instruments, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a top or plan view of the machine employed in the manufacture of musical instruments embodying my invention. Fig. 2 is a longitudinal vertical section thereof. Fig. 3 is a horizontal section of a portion thereof.

Similar letters of reference indicate corresponding parts in the several figures.

My invention has for its object the testing, shaping, and scouring of musical instruments generally known as "brass instruments," whereby their weakness and imperfections are exposed during the operation to which they are subjected, the proper shape is imparted to the instruments, and the perfect instruments are of superior tone and clearness.

The invention consists in forcing through the bends, crooks, and other tubular parts of the instruments one or more blocks or spheres of hard material of such diameter that the said parts will be expanded, all surplus metal removed from the inner surface thereof, and said surface scoured and made uniform, the correct exterior shape being simultaneously imparted.

Referring to the drawings, A represents a bed, on opposite ends of which are supported bosses B B', to which are fitted screws C C', which extend longitudinally, and each is provided with an operating crank wheel or handle, D.

To the screw C is swiveled or otherwise connected a follower, E, which is fitted in a boss, F, supported on the bed A, and moves in a longitudinally-extending guide, G, which is connected with said boss F, or is otherwise supported on the bed A. A portion of the guide is tubular, as at *a*, and has an opening, *b*, and throat *c*, both of which communicate with the interior of the guide, and the other portion of the guide is semi-tubular, as at *d*, whereby the channel *e*, in which the follower

E moves, is exposed. The end of the tubular portion of the guide opposite to the semi-tubular portion *d* is occupied by a collar, H, which may be removed, so that collars of different bores may be substituted and employed.

To the inner end of the screw C' is attached a head, C'', whose object is to clamp a die, J, to the end of the guide G, said head being removable, so that heads of different sizes may be employed relatively to the length of the die J. The die has within it a groove or grooves of the correct contour of the crook, bend, or part of the instrument to be operated upon, and is formed of sections, whereby access is had to said part for the application and removal of the same, the sections in the present case being held together by a bolt, K, the end of which opposite to the head is slotted for the insertion of a securing-key, K'; but said end may be threaded and a nut employed in lieu of the key.

L represents a number of spheres of steel or other hard material, which are introduced into the tubular portion of the guide G through the opening *b*; and M represents a plunger, which is fitted in the channel *e* of the portion *d* of said guide.

The operation is as follows: The die is opened and the crook or piece placed in position therein, one end of the piece projecting, as seen in Figs. 2 and 3. The die is then closed and secured and clamped to the guide G by means of the screw C', the projecting end of the piece entering the collar H. The screw C is run back to full extent, and a number of spheres L introduced into the guide G through the opening or inlet *b*, and directed toward the die J. A sufficient number of plungers M are then fitted into the guide G behind the row of spheres and the screw C rotated, whereby the plunger and spheres are advanced, and the latter enter the piece of the instrument within the die J. The spheres are of varying diameters, the one *a*^x (shown with a heavy periphery, see Fig. 3) being adapted to fit the piece so snugly and tightly that considerable force is required to advance the same. The sphere in advance, called the "pilot," and those following, are of less diameter than the sphere *a*^x. The pilot sphere or ball passes through the piece and operates to a certain extent to remove imperfections on the inner surface of the piece

and distend the piece to the extent of its ability. The larger sphere or ball a^x , following the pilot, removes all remaining imperfections or projections from the inner surface of the piece, and straightens out the piece where bent, and expands the same wherever the diameter is reduced. Where the thickness of the metal is inferior, the sphere or ball will cut through the same and indicate the necessity of soldering, filling up, &c. The spheres or balls which follow the sphere a^x force the latter through the piece, as many of the same being employed as necessary, until said sphere emerges from the end of the piece opposite to that in which it entered, the other spheres or balls then rolling out of the piece, leaving the same entirely free of the spheres, the die then being separated or opened and the piece removed.

It will be seen that during the passage of the sphere a^x the piece is subjected to severe pressure; but owing to the holding-power of the walls of the dies it is prevented from bursting or being fractured. As the piece is expanded by the sphere a^x , it is forced into correct shape and smoothed out, excepting at weak places and flaws, as has been stated, and the interior of the piece is scoured, cleared, and made uniform, the result being an instrument of correct shape, greater strength and clearness, and of superior tone. The throat c admits of the insertion of a suitable implement for primarily moving the balls toward the die, and locating and removing the plunger or plungers M , the latter being preferably scored, grooved, or threaded on their surfaces for the engagement of said implement.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a pair of dies for

holding a tubular part of a musical instrument, a series of balls or other detachable pieces and a piston, whereby said balls are forced through said tubular part, substantially as set forth. 45

2. A holding and shaping die for the tubular piece of a musical instrument, in combination with balls of unequal size and means for propelling them through said tubular piece, substantially as set forth. 50

3. A follower and clamping-head, in combination with a tubular guide, movable blocks or balls within said guide, and a holding and shaping die for securing the article to be operated upon, substantially as and for the purpose set forth. 55

4. A follower, guide, movable blocks or balls within said guide, and a die for securing the article to be operated upon, in combination with a clamping-head removably connected to an operating-screw, substantially as and for the purpose set forth. 60

5. A follower, movable blocks or balls, a die for securing the article to be operated upon, and a clamping-head, in combination with a guide containing said blocks or balls, having a removable collar, substantially as and for the purpose set forth. 65

6. The guide G , formed with an opening or inlet, b , and a throat, c , in combination with a series of balls within said guide and devices for impelling them, substantially as and for the purpose set forth. 70

7. The follower with an operating-screw, the guide, plungers, movable blocks or balls, holding-die, and the clamping-head with an operating-screw, combined and operating substantially as and for the purpose set forth. 75

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Witnesses:

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