(No Model.) 2 Sheets—Sheet 1.

V. C. A. P. D. G. COMTE DE NYDPRUCK & L. A. BEUNON.

Piano Action.

No. 239,670. Patented April 5, 1881.

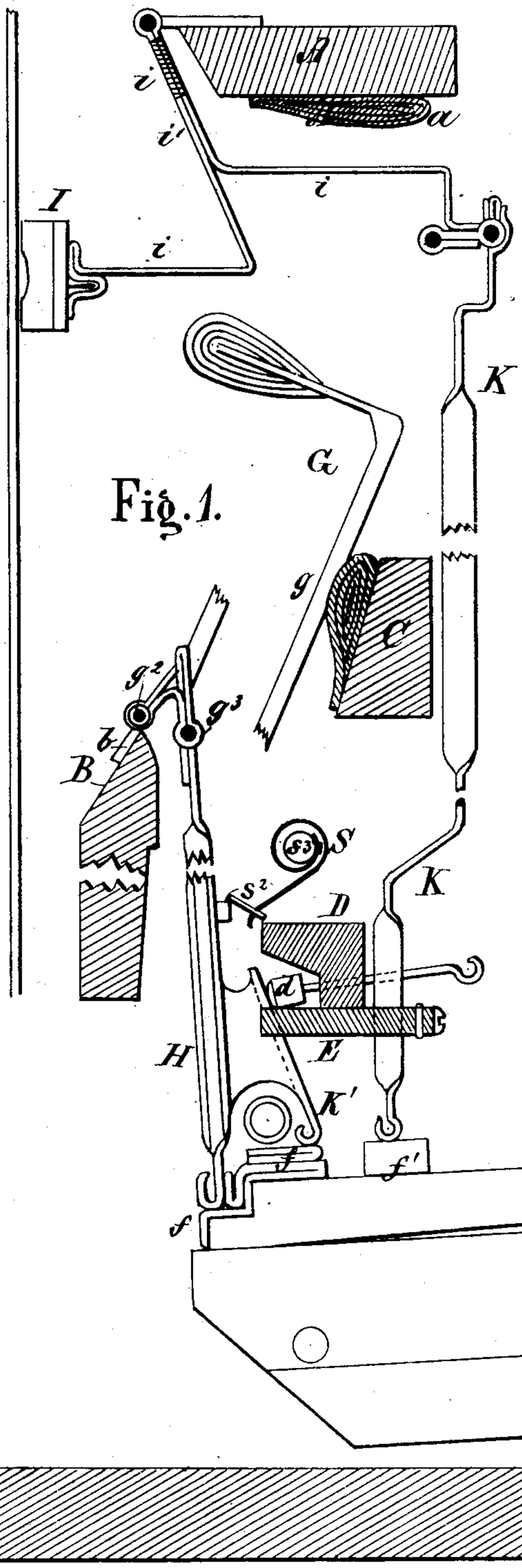

Fig. 1.

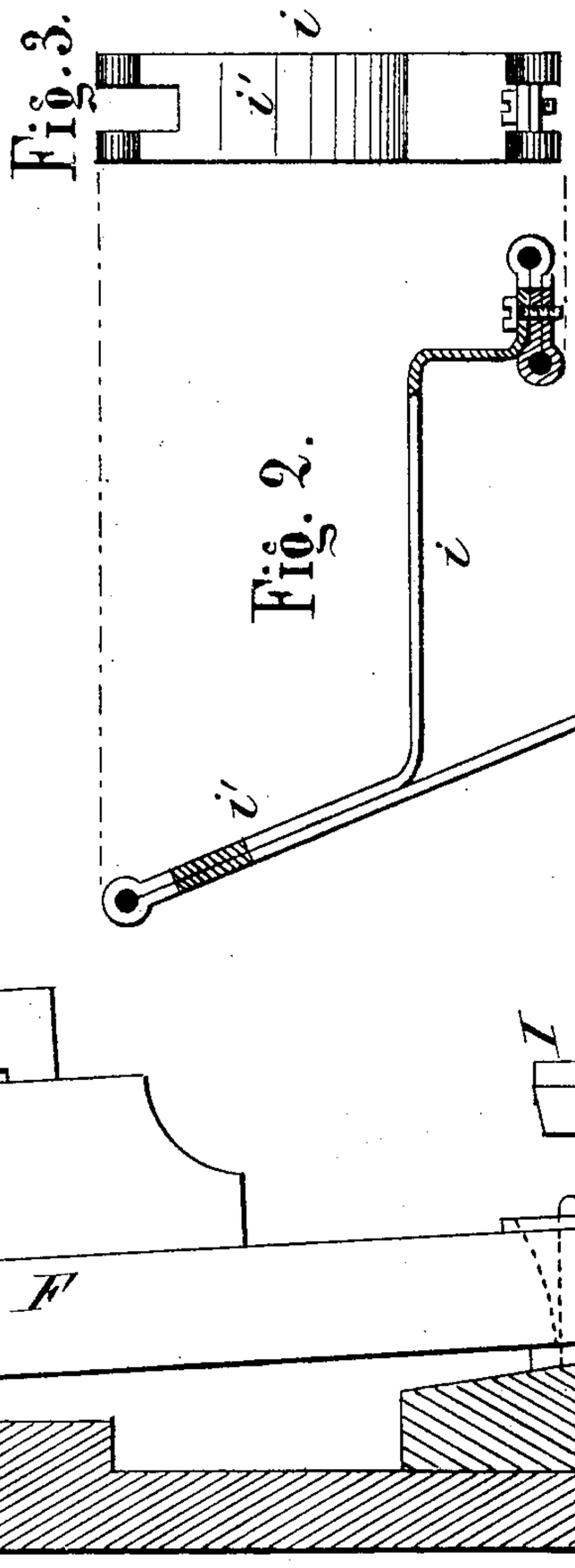

Fig. 3.

Fig. 2.

Witnesses.
Wm. A. McElwee
G. B. Fowles.

Inventors.
Vitold, C. A. P. D. G. comte de Nydpruck
Louis A. Beunon
per Henry Orth att'y

(No Model.) 2 Sheets—Sheet 2.

V. C. A. P. D. G. COMTE DE NYDPRUCK & L. A. BEUNON.

Piano Action.

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Fig. 5.

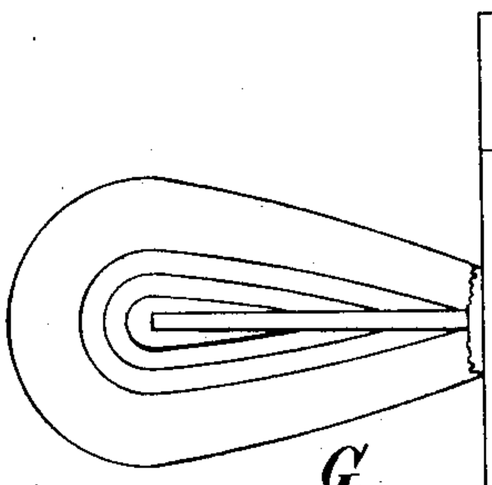

Fig. 4

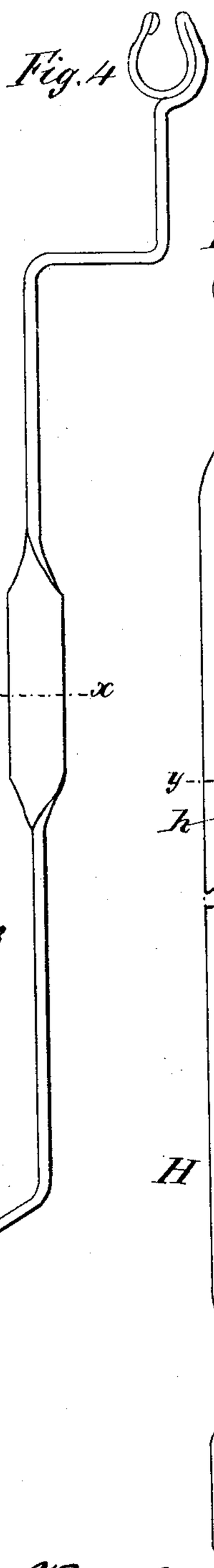

Fig. 9

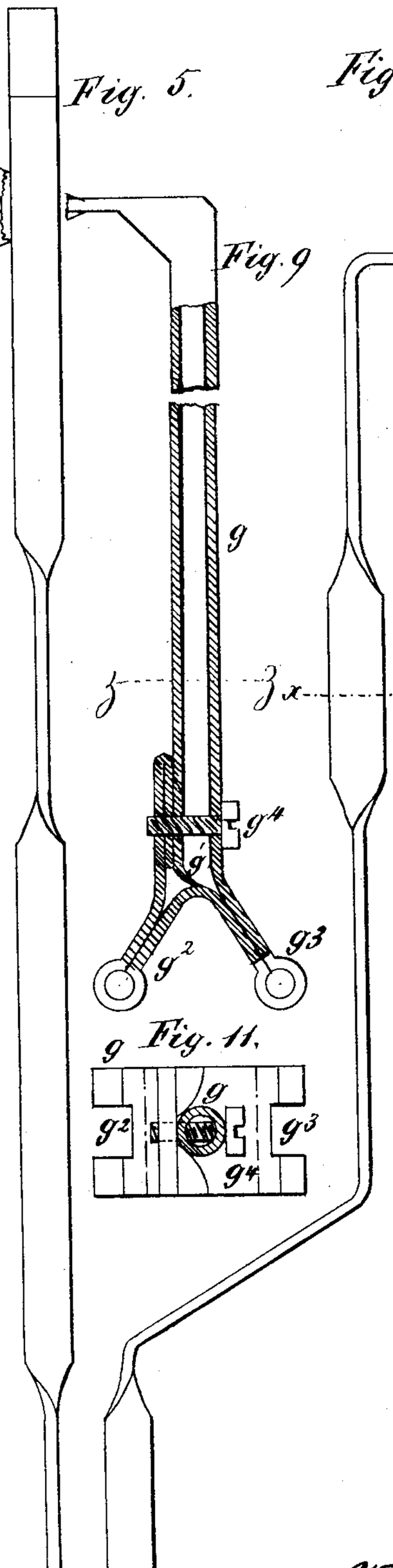

Fig. 7.

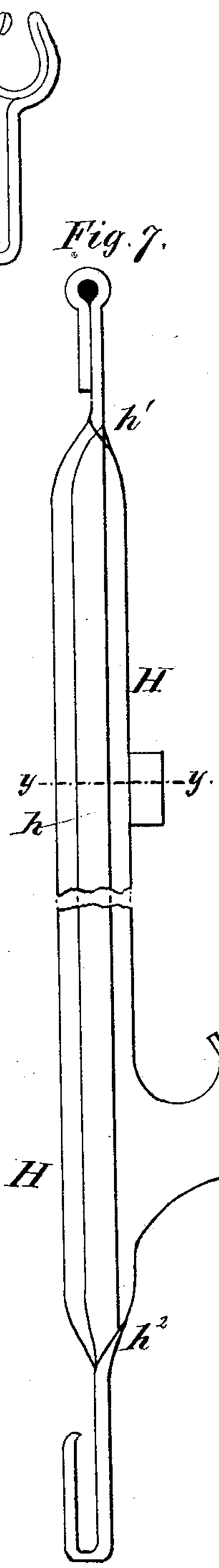

Fig. 6

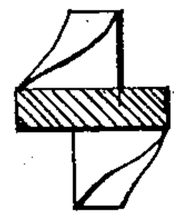

Fig. 8.

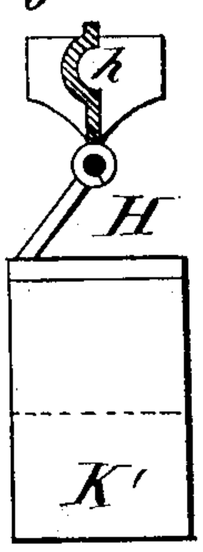

Fig. 10.

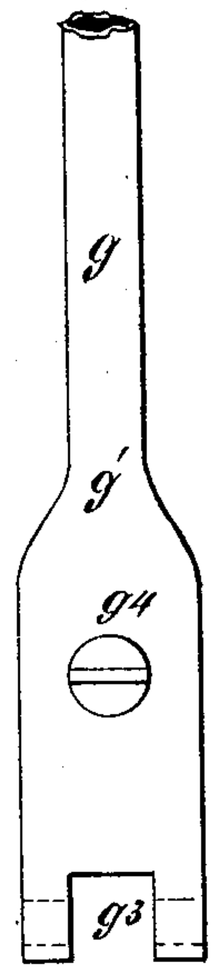

Fig. 11.

Witnesses
G. B. Towles.
Wm. A. McElwee.

Inventors
Witold, C. A. P. D. G. comte de Nydpruck
Louis, A. Beunon
per Henry O'Reilly
Atty

UNITED STATES PATENT OFFICE.

VITOLD CHARLES ANTOINE PHILIPPE DIEUDONNÉ GUILLAUME, COMTE DE NYDPRUCK, AND LOUIS ANTOINE BEUNON, OF PARIS, FRANCE.

PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 239,670, dated April 5, 1881.

Application filed November 29, 1880. (No model.)

To all whom it may concern:

Be it known that we, VITOLD CHARLES ANTOINE PHILIPPE DIEUDONNÉ GUILLAUME, Comte de Nydpruck, and LOUIS ANTOINE BEUNON, citizens of France, residing at Paris, in the Department of the Seine and Republic of France, have invented certain new and useful Improvements in Piano-Actions and the Method of Constructing the Same; and we 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Our invention relates to new improvements in the construction of piano-actions; and it consists in the peculiar construction and combination of the several elements of a piano-action, as hereinafter fully described, and as illustrated in the accompanying two sheets of drawings, in which—

Figure 1 shows, in elevation, a piano-action constructed according to our invention. Figs. 2 and 3 are side and front elevations, respectively, of the damper, the former partly in section. Figs. 4 and 5 are side and front elevations of the damper-lifting jack; and Fig. 6 is a section on line *x x* of Fig. 4. Figs. 7 and 8 show in elevation and in section, respectively, the hammer-lifting jack, the section being taken on line *y y*, Fig. 7. Fig. 9 shows, in elevation, partly in section, the hammer and its rod. Fig. 10 is an elevation of the lower part thereof, and Fig. 11 a section on line *z z* of Fig. 9.

We have employed like letters of reference to indicate like parts wherever such may occur in the above figures of drawings.

The usual construction of piano-actions is so well known that we deem it inexpedient to enter into minute details of description, as those conversant with the art to which this invention appertains will readily understand the same without such description, and it will suffice here to say that we not only reduce the heretofore complicated mechanism and numerous parts of said actions to four pieces, but also that these pieces are all made of metal, except such parts thereof as cannot be made of this material, such as the hammer itself, the damper-cushions, and the buffers, and abutments, which are made of the usual materials employed therefor.

In Fig. 1 we have shown the entire action of our improved construction, and A represents the damper-rail provided with the flexible cushion or abutment *a* for the damper-rod. B is the hammer-rail; C, the hammer-rest rail with its usual cushions; D, the buffer-rail with its adjustable buffers *d;* E, the guide-rails for the jacks; and F is the key, with its flexible abutment *f*, for the hammer-jack, and the lifting-blocks *f'* for the damper-jack.

It will be seen that we employ here only four principal operating-pieces—namely, a hammer, G, a hammer-jack, H, a damper, I, and a damper-jack, K, the hammer-jack being provided with a rearwardly-projecting abutment or repetition spring, K', which latter is integral with the jack. These parts are all made of thin sheet metal, and the method we employ for imparting to these pieces the necessary elasticity and strength, according to the work they have to perform, is as follows:

For such parts as require greatest strength, and consequently least elasticity or pliability—as hammer-rods, for example—we take the strip of sheet metal, whether iron, brass, or other preferred metal, and bend it in the form of a tube, as shown, (Figs. 1, 9, and 10,) said strip being of the required shape, so that the tubular portion will extend only to a certain point, *g'*, of the hammer-rod *g*, leaving a flat extension, which is then doubled upon itself to form one hinge-bearing, g^2, then again bent downward and doubled upon itself to form a second hinge-joint, g^3, the flat part of the strip being then brought upon the tubular rod and there secured by a screw, g^4, or other suitable means, all as plainly shown in Fig. 9.

When it is desired to impart to the piece a greater elasticity, consequently less rigidity—as for the hammer-jacks, for instance—instead of bending the blank or strip of sheet metal into tubular form, we corrugate or form a groove, *h*, longitudinally of the strip, and twist the upper and lower end, *h' h²*, at right angles to the

body, the upper end being bent to form the hinge-joint to hinge it to the corresponding joint g^3 of the hammer-rod, the joint g^2 being connected with that *b* of the hammer-rail B, thus forming the hinges which connect the parts flexibly together.

When it is desired to impart to the piece still greater elasticity, hence less rigidity, as is required for the damper-jacks, we simply twist the strip of sheet metal at such places where the hinges are formed, and if greater rigidity is required we increase the twists to four or more, as shown in Figs. 1, 4, and 5. By means of these blanks or strips of metal, the necessary shape or fit may also be given to the particular piece, as said strips may be bent at any desired angle, doubled upon themselves, or twisted to increase or decrease their elasticity, as shown in the construction of the damper-rod *i*, Figs. 1, 2, and 3, where the greatest rigidity is required at i', and also a hinge, as at i^2, to hinge it to the damper-rail C, which is obtained by doubling the strip upon itself for a certain distance and without twisting.

In practice the strips of metal are stamped out in required lengths and shapes, according to the use made thereof, and then bent, twisted, or doubled and shaped.

Instead of using the usual piece of wire and cord for retracting the hammer-jack, we employ a flat metal spring, S, secured to a button, s^3, the free end of which is secured in a socket, s^2, formed by bending over a projection on the blank or metal strip, and we find this a much simpler and especially a much cheaper construction, and which can be more readily applied, or said spring may be connected to the jack in any other manner.

The abutment on the rear of the jack or repetition spring K′ is formed by inserting a flat spring into a socket also formed by doubling or bending a portion of the blank.

From what has been said it will readily be understood, especially by those conversant with the construction of piano-actions, that our improvements not only greatly simplify the construction of piano-actions, but very considerably reduce their cost.

We are aware that twisting, doubling, or corrugating sheet metal to impart greater strength thereto is not new, and we do not desire to claim this, broadly; but

What we do claim, and desire to secure by Letters Patent, is—

1. A piano hammer-rod having a tubular body and a double hinge, g^2 g^3, made from a single blank of sheet metal, substantially as shown, and for the purposes specified.

2. A piano damper-rod having double and single hinges made from a blank of sheet metal doubled and bent to the shape, substantially as shown and described.

3. A hammer-jack for piano-actions, having a corrugated body, a socket, s^2, and spring K′, made from a blank of sheet metal bent to the shape, substantially as shown and described.

4. A piano-action composed of four pieces, G, H, I, and K, made from suitable sheet-metal blanks rolled, twisted, doubled, and bent, as described, in combination with an actuating-key, as shown and for the purposes specified.

5. The combination, in a piano-action, of a key with the hammer-jack H, provided with a spring, K′, and a hinge-joint, the hammer G, having hinges g^2 g^3, the guide-rail E, and buffer *d*, said jack and hammer-rod being made of metal bent in the manner substantially as described, and arranged to operate as set forth.

6. The combination, with the hammer G and the jack H, having a socket in its rear face, of the coiled retracting-spring S, and buffer *d*, all constructed and arranged to operate substantially as and for the purposes specified.

7. The combination, in a piano-action with a key, of the jack H, having a spring, K′, and a socket, s^2, the retracting-spring S, damper-jack K, and damper I, all constructed and arranged to operate substantially as shown, and for the purposes specified.

In testimony whereof we affix our signatures in presence of two witnesses.

LE COMTE DE NYDPRUCK.
L. BEUNON.

Witnesses:
ROBT. M. HOOPER,
E. BAGER.