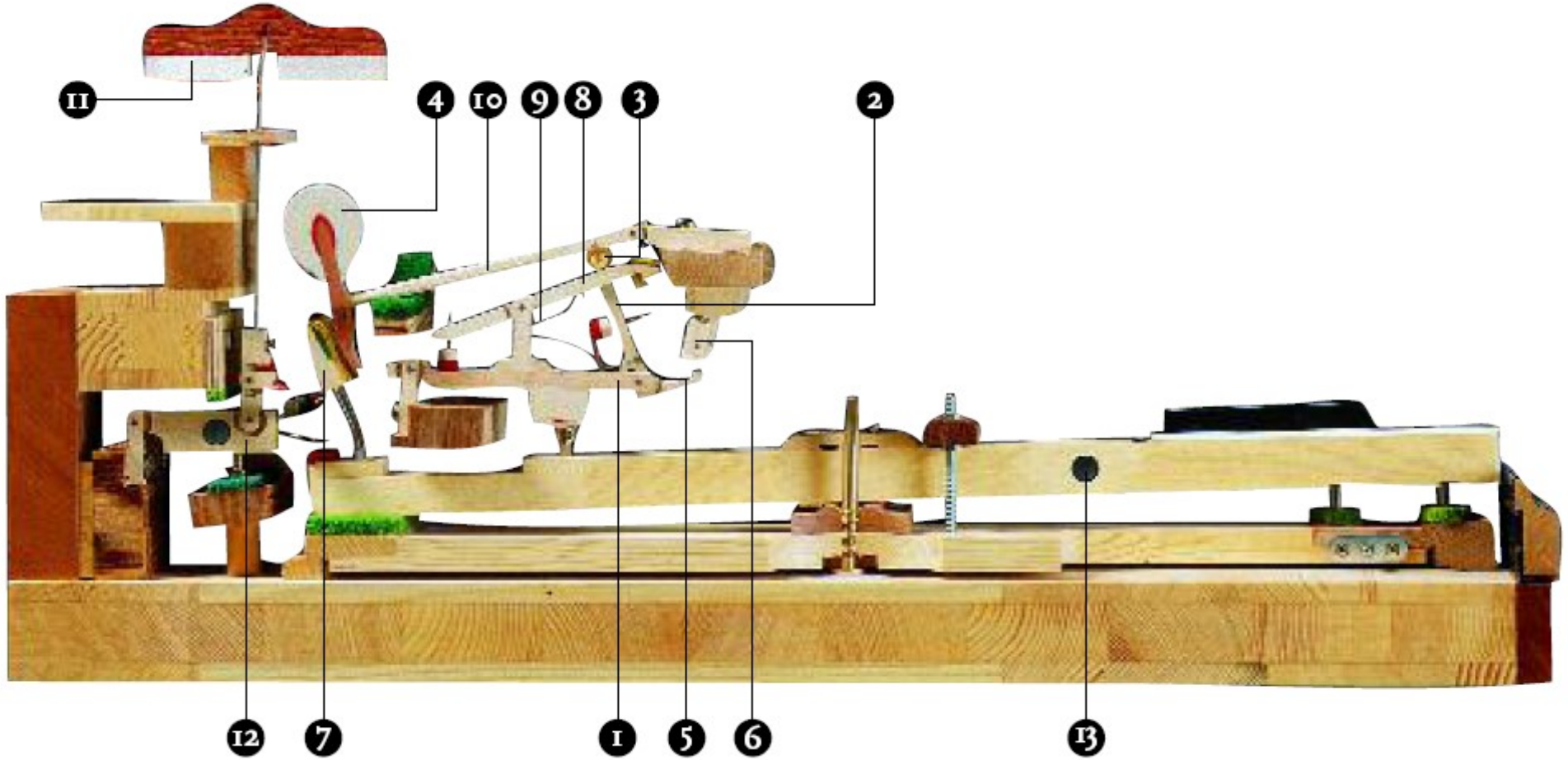
The piano's heart

The keyboard and action assembly of a grand pianos - details



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From the keys to the hammer heads

The keyboard and action assembly of today's grand piano mirrors the 300-year history of the development of the hammer mechanism. As seen is Bartholomeo Cristofori's instrument in 1700, today's hammer mechanism is arranged above the keys and works on the stroke principle as used for the first time 300 years ago.

Depressing the front half of the key causes the whippen (1) to move upwards. The jack (2), which pivots on the whippen (1), transmits its upward motion to the hammer knuckle, or roller (3), moving the hammer heads upwards. Immediately before the hammer head (4) strikes the strings, the jack tender (6) is pushed against the regulating button (6), tripping the jack tongue out from under the hammer knuckle. This interrupts the direct contact between the jack and the knuckle, and hence the direct contact between the key and the hammer shank assembly.

Whilst the key moves back to the resting position, the hammer head continues to move to the strings on its own momentum, rebounds from the strings and it stopped at half level by the back check (7). This causes the repetition lever to be pushed downwards, increasing the tension in the repetition spring (9).

As soon as the back check (7) releases the hammer head, the repetition lever lifts the hammer shank (10) so that the jack can return to its attack position under the hammer knuckle. A new blow can now be struck without the key having to return completely to its upper rest position.

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Damper system – pedal function

The damper mechanism is located behind the keys in grand pianos. The damper head (11) is located directly above the related string. The raising of the back end of the key raises the related damper head, whereby the related string is free to vibrate. The whippen of the damper mechanism is fitted with little lead weights, which allows for the necessary pressure of the damper heads to dampen the vibrating string as soon as the key returns to its resting positions. If the sustaining pedal is pressed, the damper heads remain in a lifted position (see centre left picture).

The sustaining pedal (right pedal) affects the damper system. This causes all dampers to be raised simultaneously, permitting the strings to vibrate freely. For music, this precise function plays an important role.

The sostenuto pedal enables the selective control of the damping and sustaining properties of individual notes or keys. Depressing the sostenuto pedal allows the damper heads, which have been raised by the individual keys or by use of the sustain pedal, to remain in their raised position when the related key or sustaining pedal has been released. These notes can therefore vibrate independently of the continuous playing of the keys.

With the help of a piano pedal (left pedal) the entire playing mechanism of the grand piano can be shifted toward the right. By means of this, only two of the three strings per tone are struck respectively in the mid and treble range, whereby the audible volume clearly decreases. In the historical fortepianos of the 18th century that are only strung with two stings per tone, the piano pedal or the corresponding knee lever caused only one string to be struck. It is for this reason that during this period, one spoke of the “una-corda” pedal.