

(No Model.)

W. BIEGER.  
PIANO.

No. 464,239.

Patented Dec. 1, 1891.

Fig. 2.

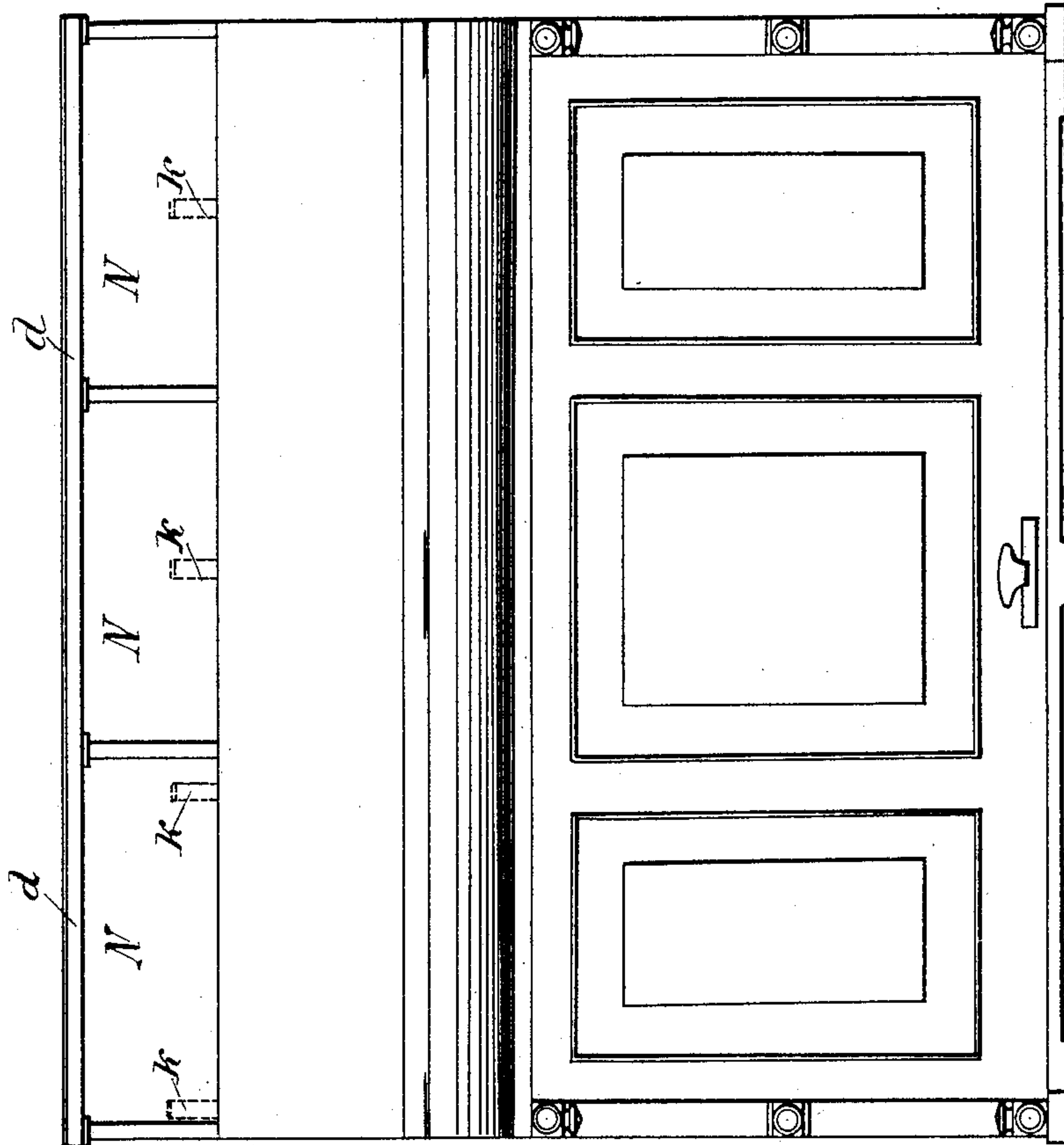
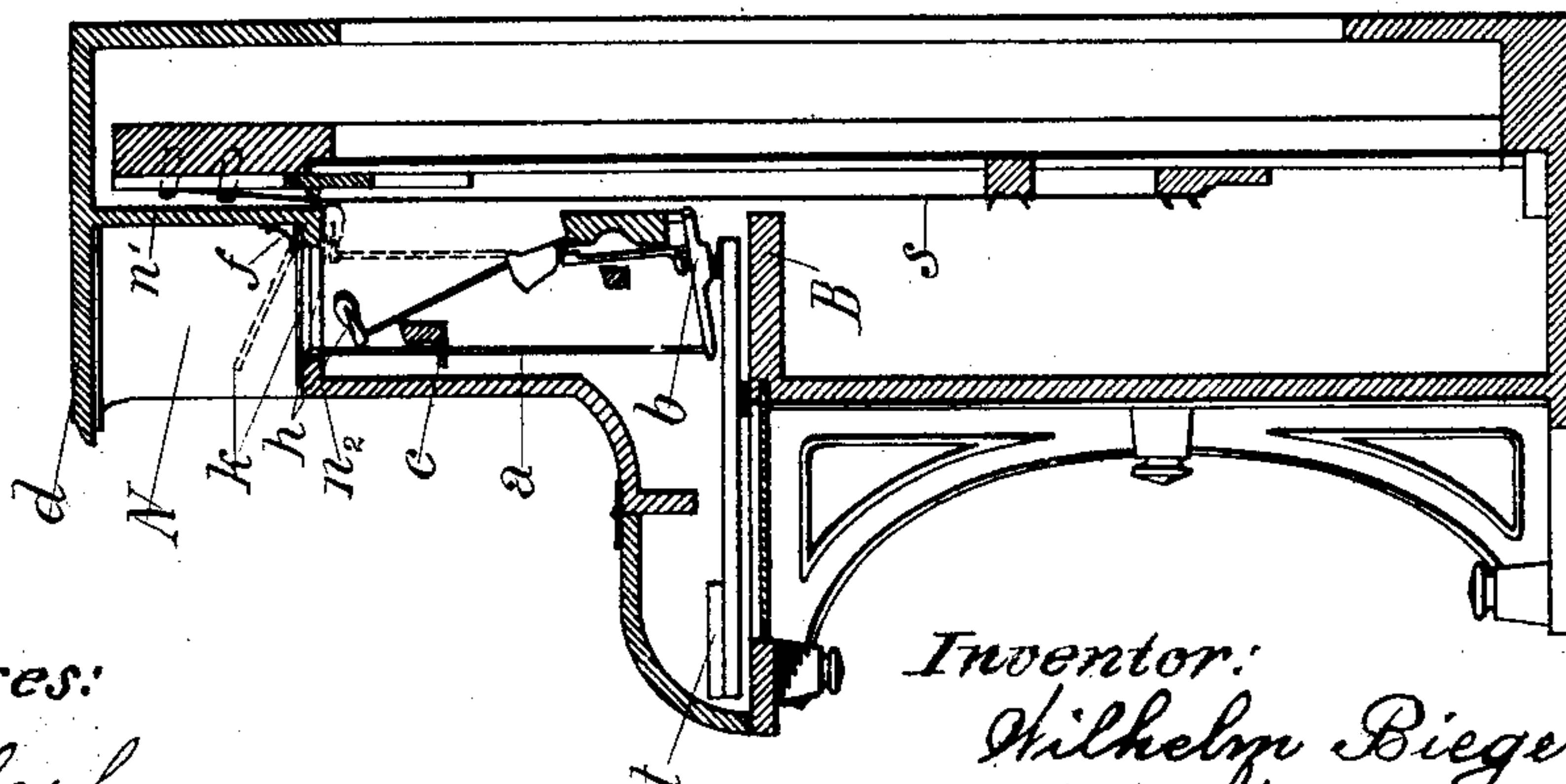


Fig. 1.



Witnesses:  
E. Clark  
R. E. Auld.

Inventor:  
Wilhelm Bieger  
by Max Gergü  
his Attorney

# UNITED STATES PATENT OFFICE.

WILHELM BIEGER, OF STUTTGART, GERMANY.

## PIANO.

SPECIFICATION forming part of Letters Patent No. 464,239, dated December 1, 1891.

Application filed July 16, 1891. Serial No. 399,710. (No model.)

*To all whom it may concern:*

Be it known that I, WILHELM BIEGER, a subject of the King of Würtemberg, residing at Stuttgart, Würtemberg, in the German Empire, have invented a new and useful Improvement in Pianos, of which the following is a specification.

My invention consists in upright pianos constructed with a niche or recess arranged above the hammers and between the front and the strings and whose bottom may be provided with registers or sound-apertures adapted to be closed or with valves which are separately opened or closed, according to the key or keys that are struck.

The object of my invention is to increase the acoustic effect of upright pianos by reducing to a minimum the space directly above the keys and between the front and top of the casing and the sounding-board by the arrangement of a niche or recess. By this means the vibrations caused by the impact of the hammers against the strings within the space thus contracted produce a stronger effect. The sound is, moreover, permitted to escape directly to the front by means of the sound registers or valves arranged in the bottom of the niche.

In the drawings accompanying this specification, Figure 1 represents a vertical transverse section, and Fig. 2 a front elevation, of an upright piano embodying my invention.

The recess or niche N at the front is formed by the top  $d$  of the upright piano above, the vertical somewhat inclined wall  $n'$ , arranged directly in front of the tuning-pegs, and the horizontal or somewhat inclined partition  $n^2$  at the bottom and located directly over the line of hammers. This floor-partition  $n^2$  of the recess N is provided either with sound-registers or sound-openings of considerable size adapted to be controlled by movable lids or with separate valves  $k$  equal in number to the keys. These valves are so arranged that upon the action of a certain hammer the corresponding valve is simultaneously opened, thus permitting the direct exit of the sound

produced, the niche or recess N serving to still further increase its volume.

The automatic opening of the valves  $k$  is effected by a rod  $a$ , connected to the end of the lever  $b$  and guided by the angle-iron  $c$ , attached to the hammer-rest. The valves are closed by their own weight or by small springs  $f$ , bearing upon the valves.

The advantage of my arrangement of a niche in the upright consists, principally, in improving the acoustic effect, which is attained without increasing the height or depth of the casing of the upright, the niche being simply built into the casing. Hence no increase in the cost of production arises if separate valves  $k$  are not employed, and even with such addition the increased cost is slight.

I may also apply my recess to finished up-rights not so provided at a trifling cost.

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

1. In upright pianos, the combination of valves corresponding to the various keys, with the keys and intermediate mechanism to actuate the valves by the action of the keys, substantially as set forth.

2. In upright pianos, the combination of a recess formed in the top of the upright, with valves arranged in the bottom wall of the recess and adapted to be actuated by the keys, substantially as set forth.

3. In upright pianos, the combination of a niche or recess N, open in front, formed by the top of the upright, a wall  $n'$ , arranged directly in front of the tuning-pegs, and a bottom wall  $n^2$ , located directly over the hammers, the said bottom wall being provided with a series of separate valves, one for each key and automatically controlled by said keys, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILHELM BIEGER.

Witnesses:

AUGUST B. DRAUTZ,  
LUDWIG KUTSCHER.