E. DE KLEIST.

PNEUMATIC MUSICAL INSTRUMENT.

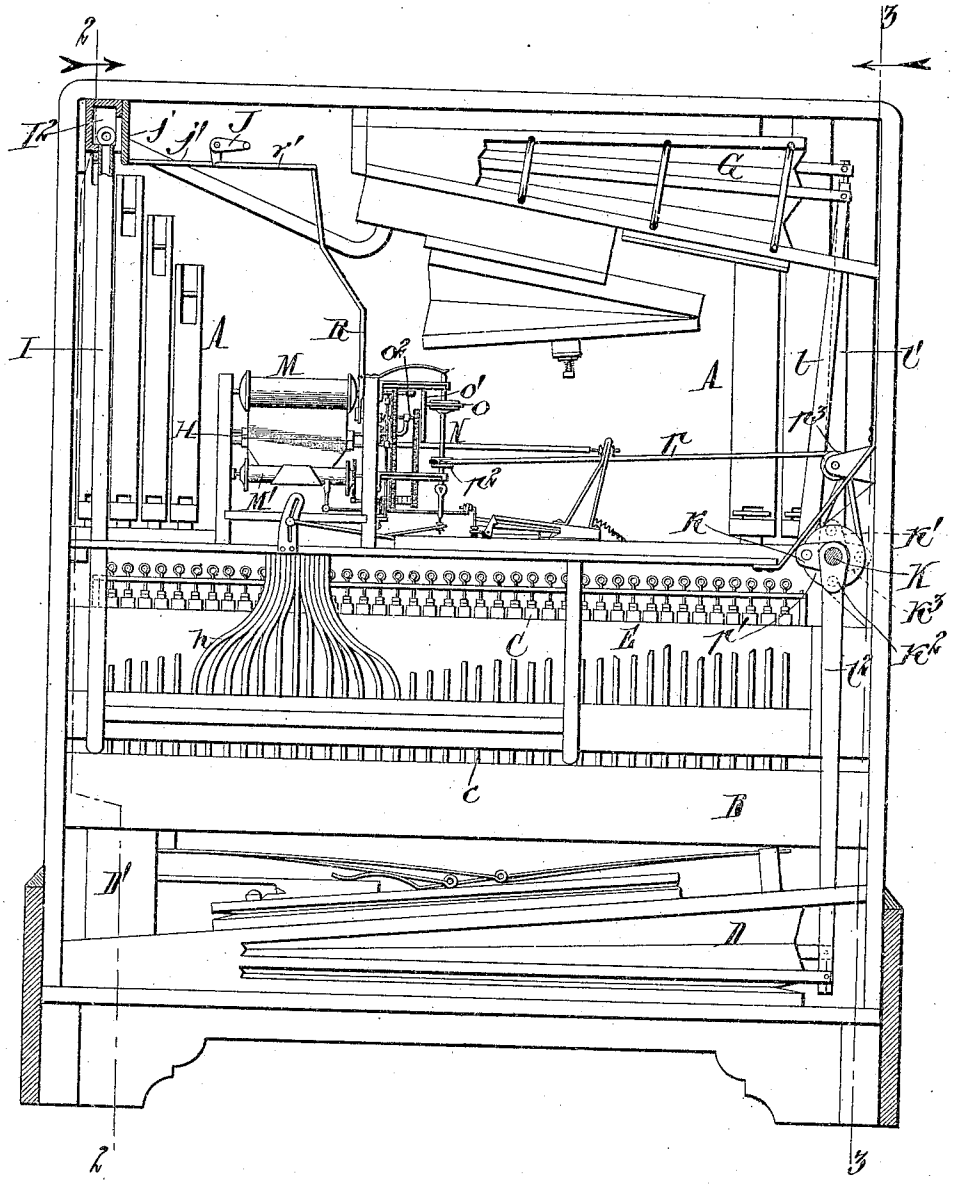
APPLICATION FILED MAY 6, 1908.

952,262.

Patented Mar. 15, 1910.

3 SHEETS—SHEET 1.

Fig. 1.



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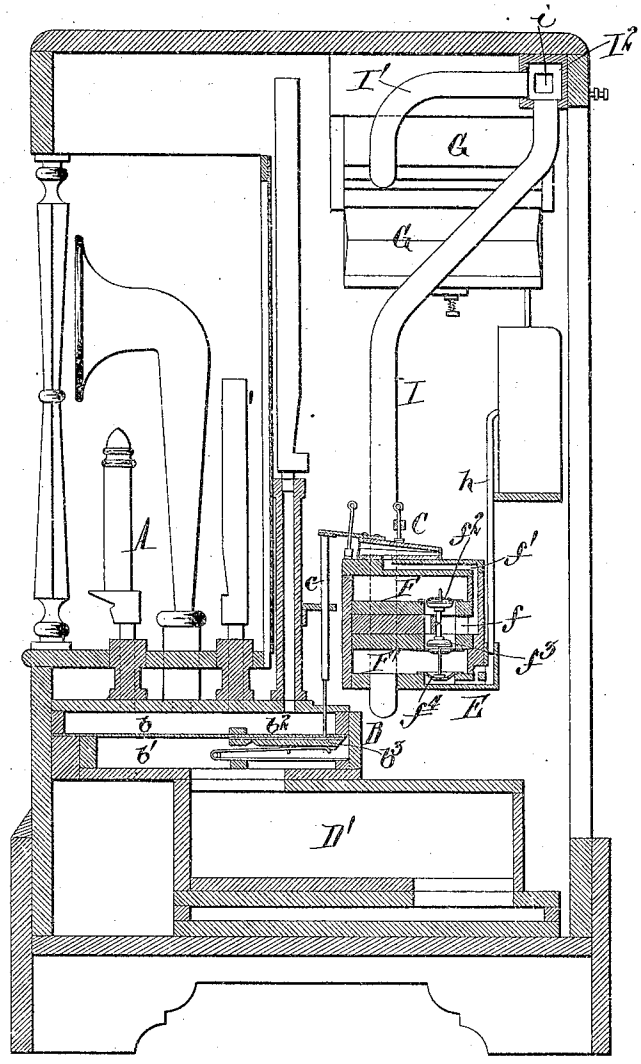
3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

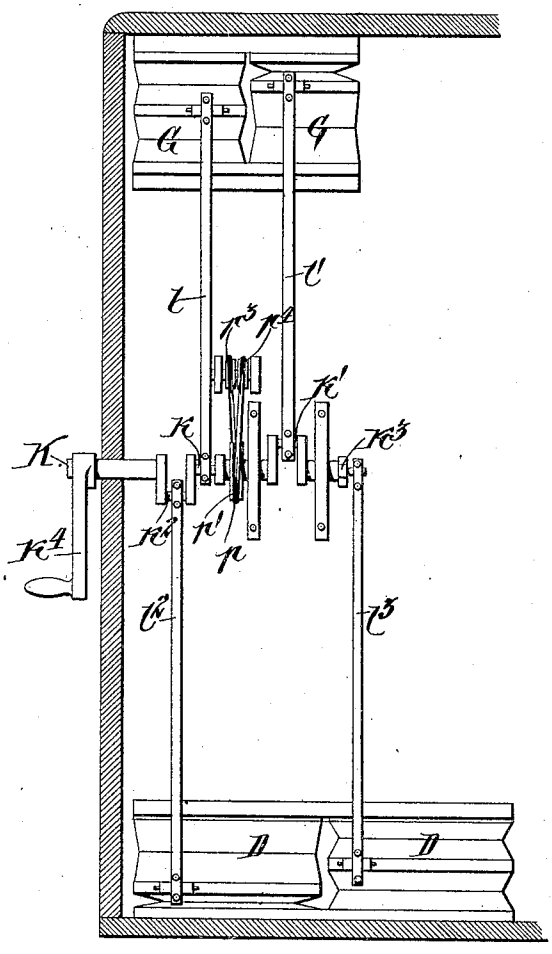
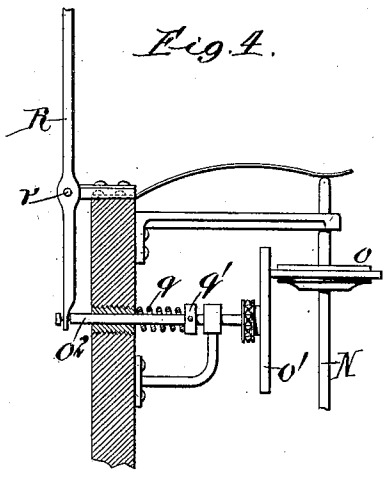


Fig. 4.



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UNITED STATES PATENT OFFICE.

EUGENE DE KLEIST, OF NORTH TONAWANDA, NEW YORK, ASSIGNOR TO THE RUDOLPH WURLITZER COMPANY, OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

PNEUMATIC MUSICAL INSTRUMENT.

952,262. Specification of Letters Patent. **Patented Mar. 15, 1910.**

Application filed May 6, 1908. Serial No. 431,083.

To all whom it may concern:

Be it known that I, EUGENE DE KLEIST, a citizen of the United States, residing at North Tonawanda, in the county of Niagara and State of New York, have invented a new and useful Improvement in Pneumatic Musical Instruments, of which the following is a specification.

This invention relates to pneumatic musical instruments and more particularly to organs in which the valves which control the passage of the air to the pipe or other sound-producing parts are operated by a pneumatic action and tracker mechanism including a reversing gear for automatically rewinding the music sheet.

The object of the invention is to improve the arrangement of the pressure and exhaust bellows and the driving mechanism of the same and the music and take-up rolls with a view of rendering the instrument compact in construction and facilitating access to said parts for readily repairing and renewing them.

In the accompanying drawings consisting of 3 sheets: Figure 1 is a sectional rear elevation of a pipe organ embodying the invention, the rear wall of the case being omitted. Fig. 2 is a transverse vertical section thereof in line 2—2, Fig. 1. Fig. 3 is a similar section in line 3—3, Fig. 1, showing the driving connections between the crank shaft and the suction and pressure bellows. Fig. 4 is a fragmentary sectional elevation, on an enlarged scale, of the driving gear of the music and take-up rolls, showing the means for stopping the instrument.

Similar letters of reference indicate corresponding parts throughout the several views.

A indicates the organ pipes and B the wind or pressure chest which may be of ordinary construction, b Fig. 2, indicating one of the individual ducts or channels thereof with which the respective organ pipe or pipes communicate; b^1 the longitudinal compressed air chamber common to all of said ducts and with which each of the latter communicates by the usual port b^2 controlled by a valve or pallet b^3. These valves are opened by the customary motor pneumatics C through stickers c.

D indicates the pressure bellows, two of these being preferably employed, which rest on the bottom of the inclosing case, as shown in Fig. 3. They are connected with the main pressure chamber b^1 of the wind chest by a trunk D^1.

The motor pneumatics C may be controlled by a pneumatic action and coöperating tracker-mechanism of any suitable construction. In the preferred construction shown, E indicates the wind chest of this action arranged above the pressure bellows D and in rear of the groups of organ pipes. This chest contains the usual air chamber F which communicates with the atmosphere and the exhaust chamber F^1 connected with a pair of main suction or exhaust bellows G.

f indicates one of the individual exhaust and flushing channels with which the corresponding motor pneumatic communicates by a duct f^1; f^2, f^3 the double puppet valve controlling the ports which connect said channel with the air and exhaust chambers F, F^1; f^4 the diaphragm for operating said valve, and h the usual tubes leading from the diaphragm chambers to the ducts of the tracker board H.

The exhaust chamber F^1 of the wind chest E is connected with the suction bellows G by tubes or conduits I, I^1 and an interposed valve box or chamber I^2 which latter is conveniently located in one of the upper rear corners of the case, as shown. This box is provided in one of its walls with a flushing port i controlled by a swinging or other suitable valve j which is normally closed and which is opened when it is desired to flush the wind chest for rendering the motor pneumatics inoperative and promptly stopping the playing of the instrument. In the construction shown in the drawings, this flushing valve is opened by a bell crank lever J, one arm of which is connected with the valve by a rod j^1, while its other arm has a suitable handle for turning it.

The suction bellows G are preferably arranged in the upper rear portion of the case above the exhaust wind chest E, and these bellows and the pressure bellows D are operated from a common transverse crank shaft K suitably supported within the case at one side thereof. This shaft has a pair of differently-located cranks k, k^1 with which the movable boards of the suction bellows are connected by pitmen l, l^1, and a second pair of similarly-arranged cranks k^2, k^3 with which the movable boards of the pressure bellows D are connected by pitmen

l^2, l^3, as shown in Figs. 1 and 3. The driving shaft K extends through the rear wall of the case and is provided with a hand crank k^4, but it may obviously be driven by an electric or other suitable motor, if desired. This construction, while furnishing a simple and direct driving mechanism for both the suction and pressure bellows, permits a convenient and accessible arrangement of said bellows and a compact construction of the instrument.

M is the usual music roll and M^1 the take-up roll of the perforated music sheet. The driving gear of these rolls may be of any suitable or well-known reversible construction, the preferred mechanism shown in the drawings being of the mechanical type and including an upright driving shaft N carrying a friction wheel o which engages a friction disk o^1 mounted on a horizontal shaft o^2 from which the music and take up rolls are alternately driven by suitable connections. The upright shaft N is driven from the crank shaft K by a belt p running around a pulley p^1 on the latter shaft, a pulley p^2 on the upright shaft N and guide pulleys p^3, p^4 arranged above the crank shaft and supported in brackets projecting from the adjacent side wall of the case.

The horizontal shaft o^2 is journaled in the frame of the tracker board and preferably slidable lengthwise in its bearings, so that the friction disk o can be moved into or out of gear with the friction wheel for driving or stopping the music roll and take-up roll. Said friction disk is yieldingly held against the friction wheel o by a spring q surrounding the shaft o^2 between a collar q^1 thereof and the adjacent member of the tracker frame. The shaft o^2 is moved in the opposite direction for withdrawing the friction disk from said wheel, by a lever R pivoted to the tracker-frame at r and having its lower arm connected with the inner end of said shaft, while its upper arm is connected with the lower arm of the hand lever J by a rod r^1. By this construction and arrangement, upon swinging this lever in the proper direction, the driving mechanism of the music and take-up rolls is thrown out of gear with the crank shaft K at the same time that the wind chest E is flushed by the opening of the valve j.

I claim as my invention:—

1. In an instrument of the character described, the combination with the pressure and exhaust wind chests and the tracker mechanism including music and take-up rolls and gearing for rotating the same, a driving shaft journaled in the case of the instrument, pressure and exhaust bellows for said chests arranged above and below said shaft respectively, actuating connections between said upper and lower bellows and said driving shaft, and means for transmitting motion from said driving shaft to the actuating gearing of the music and take-up rolls, substantially as set forth.

2. In an instrument of the character described, the combination with the pressure and exhaust wind chests and the tracker mechanism including music and take-up rolls and gearing for rotating the same having a driving pulley, a horizontal driving shaft arranged transversely in the case of the instrument and having a plurality of cranks and a pulley, pressure and exhaust bellows for said chests arranged above and below said shaft respectively, pitmen connecting the movable boards of said upper and lower bellows with the crank of said shaft, guide pulleys arranged above said crank shaft, and a belt running around said guide pulleys and the pulleys of said shaft and said gearing, substantially as set forth.

Witness my hand this 9th day of April, 1908.

EUGENE DE KLEIST.

Witnesses:
C. F. Geyer,
E. M. Graham.