
Evolution of the Ampico

THE EVOLUTION OF THE AMPICO

By Richard Howe & Jeffrey Morgan

*This article has been revised and updated by Jeffrey Morgan and contains important new information.
Original appeared in Nov/Dec 1991. – Robin Pratt*

Approximately seventeen years ago Dick Howe received from Al Werolin a great deal of Ampico material owned by his father, Edward S. Werolin, who was service manager for the American Piano company in the 1920's. These papers were found to contain significant unpublished information. As time permits, the balance of this information will be presented in AMICA BULLETIN articles.

One of Mr. Werolin's notebooks contained a schedule of charges for repairing and retrofitting older Ampico player actions. Since there were so many variations in these actions as they evolved, it was necessary to identify the major types so that the cost estimates would be as accurate as possible. Seven distinct types were defined as of 1925. An eighth is constructed here to complete the Ampico A era.

The information contained in the notebook shows inclusive serial numbers for each type as well as brief notations of distinguishing characteristics for uprights and grands falling within each type. To this information the authors have added elaborative comments which present additional distinguishing physical characteristics for each type.

It is very important to remember that there were many, many more variations developed by the factory to solve real or perceived problems either with the mechanisms in production or those in the field; however, space and time do not permit discussion of each and every variation. In addition, many items were later retrofitted by service personnel during normal maintenance. Also, the cut-off dates and serial number cannot be precise because manufacturing these Ampico pianos was a dynamic process with some overlap, and all changes were not made in each type of piano at precisely the same time. In any event, the information contained herein is accurate and complete enough to give an excellent picture of how the Ampico evolved.

TYPE 1 –

Manufactured Prior to 1913

Chickering	100000	–	120000	*
Knabe	46000	–	73999	
Haines	47294	–	60000	*
M. & W.	35002	–	51000	
Franklin	35922	–	50000	

**Not accurate, see note at end of article.*

Upright: Steamboat Pump, etc.

Grand: Swing-up spool box

Elaboration:

- Actually there were two distinct variations of Type 1 which can be called Type 1A and Type 1B
- As Werolin noted above, both had the diamond-shaped steamboat pumps in the uprights.

- Both were made by Auto Pneumatic.
- Both had the Auto Pneumatic staggered-hole tracking system which shifted the roll.
- Both had an automatic expression on/off switch located in rear top center of spool box on uprights.

-1A-

- Type 1A was manufactured from 1912 to very early 1913. It had metal cylindrical regulator/expression units with elastic mechanical connections to the crescendos. Regulating action and intensities were achieved by a three-stage compound plunger connected to a sleeve-type regulating valve. The area of each stage was proportioned to its assigned intensity value. Celluloid bleed inspection covers were employed. No service literature has been found for 1A which was covered in U.S. patent number 1,409,480, issued to Stoddard.
- Crescendo speeds (2-seconds fast, 11-seconds slow) fixed; not adjustable by service personnel.
- Manual expression buttons pneumatically coupled with their respective cylindrical regulator/expression units. They operated by counteracting action of regulator plungers.

-1B-

- Type 1B was manufactured for a very short period of time – from early 1913 to mid 1913. It introduced the familiar Ampico lever board regulators with the three square intensity pneumatics attached to one side. The lever board connected to a valve stem operating a disc-type regulating valve. This model employed a square, pneumatic spring attached to the opposite side of the lever board far away from the fulcrum. This “spring pneumatic” provided a pneumatic link with the crescendo. Indeed, early units had rigid red fibre gussets glued to the pneumatic cloth on both crescendos and “spring pneumatics” to solidify this link. The solid pneumatic connection between the regulator and crescendo was most important as it provided feedback to the crescendo pneumatic from the regulator board. This feedback, acting upon the crescendo pallet valve, provided the necessary snubbing and, therefore, stability to the action of the regulator valve. Additionally, this design was unique in that snubbing action was achieved without impeding the ability of the regulator to rapidly re-establish equilibrium following transients in vacuum levels caused by demands of the pneumatic stack as reflected by the three, intensity pneumatics. In fact, it represents a near perfect marriage of a vacuum regulating device with an expression-controlling device. Established here, this design concept was not to be abandoned by Ampico until the introduction of the Model “B” and thus must be considered a truly seminal idea. It minimized the possibility of annoying oscillation to which previous designs were prone. Incorporated with this first

- pneumatic-spring/crescendo feedback system, was an adjustable constant atmospheric leak, a small spring-loaded equalizer pneumatic, and a rather cumbersome tapered metering valve. These items, especially the metering valve, were overly sensitive to dirt and lint; hence they were often prone to malfunction. They were found to be unnecessary for achievement of feedback and were eliminated with type 2A. Type 1B also had celluloid bleed inspection covers. A service manual for 1B has been found. This design was covered in U.S. patents 1,409,483 and 1,409,487 which were, interestingly enough, both granted to Russell rather than to Stoddard.
- Crescendo speeds were now adjustable by service personnel.
 - Manual expression buttons were now mechanically linked to a separate set of valves which bypassed respective main regulator valves.

In the opinion of the authors, the two most important Ampico patents are 1,409,480 and 1,409,483. The next two most important are 1,409,481 and 1,409,482, both issued to Stoddard. These four patents cover basic concepts crucial to the design development of the Ampico reproducing system.

TYPE 2 –

Manufactured About 1913

Chickering	*122000	–	126999
Knabe	74000	–	81999
Haines	*60001	–	62500
M. & W.	51001	–	82000
Franklin	50001	–	55000

**Not accurate, see note at end of article.*

Upright: Auto action, square four-feeder pump, metal spider, Rigid-center bearing equalizer, amplifier from treble only, double-valve expression ends, knob repeat.

Grand: Auto action, long drawer, double-valve expression ends, knob repeat.

Elaboration:

- As used above by Werolin, the term “expression ends” refers to the expression units located at the bass and treble ends of the instrument.
- The type 2’s could also be divided into sub-groups A and B, based primarily on cosmetics.
- Both were manufactured by Auto Pneumatic.
- As with Types 1A and 1B, both had an automatic expression on/off switch located in rear top center of upright spoolbox; both retained the staggered-hole tracking system.
- As with 1B, both had adjustable crescendo speeds.
- As Werolin noted above, both had knob repeat which was activated by a traveler on a finely threaded rod on the right side of the drawer in the grand and on top of the spoolbox in the upright. This traveler was later to be fully described in the 1919 Service Manual. Late 2As and all 2Bs had amplification; activated from the treble side of the stack only.

-2A-

- Type 2A was built from about mid-1913 to late 1915. As with Types 1A and 1B, it had handsome decorative hand-grained mahogany on all expression components, the stack, the head (the long board on top of the stack which supports the spool box, air motor, etc.), including components attached thereon, and the spool box. The 2A is covered in

the Stoddard Ampico poster available from The Player Piano Company. The celluloid bleed inspection covers were retained.

- As with Type 1B, the manual expression buttons still mechanically operated separate valves which bypassed respective main regulator valves.
 - As with prior types, 2A continued to mechanically disable only the loud pedal during reroll.
 - The Loud-Normal-Soft modifying lever made its appearance on the 2A.
- 2B-**
- The 2B’s were made from late 1915 to mid-1917. Expression components were finished in plain black shellac in an apparent move to reduce costs. However, the heads and spoolboxes continue to be decoratively finished.
 - Appearing on the 2B crescendos was an external connecting tube to overcome poor gasket performance.
 - Manual expression buttons were now pneumatically incorporated with the modifying lever system, thus eliminating the need for a redundant set of valves and their cumbersome linkage.
 - The celluloid bleed inspection covers were replaced with plain pneumatic cloth punchings.
 - Both pedals now pneumatically disabled during reroll.
 - No service literature has been found for 2B. This is unfortunate as 2B enjoyed the largest production run of the early Ampicos.

TYPE 3 –

Manufactured in 1917

Chickering	12000	–	132250
Knabe	82000	–	87999
Haines	62501	–	66381
M. & W.	62001	–	77600
Franklin	55001	–	77210

Upright: Amphion action (unit), double-valve expression ends, knob repeat.

Grand: Long channel board, double-valve action, knob repeat.

Elaboration:

- With Type 3, Ampico began its long association with Amphion Piano Player Co. of Syracuse, New York. This association ultimately resulted in the absorption of Amphion by the American Piano Company.
- The Type 3 mechanisms were manufactured from mid 1917 through early 1920.
- First appearance of tracker ears which operated a moveable tracker bar-type tracking system on both uprights and grands.
- Early Amphion unit block (upside down) valves were rock maple with chrome tanned leather utilized for valve facings. Extremely high quality and expensive.
- In Types 3-8 uprights, the soft pedal unit was located on the bottom board under the expression units on the bass side of the piano.
- The upright loud pedal unit for Types 3-5 was located on the bottom board on the treble side under the expression units.
- In the uprights, only the Ampico and pedal switches were in the spoolbox on the left-hand side. Loud-Normal-Soft lever was still in the key slip. Manual expression buttons continue to function as in 2B.
- The knob repeat traveler now operated an Amphion-style

- reroll-repeat system on an Amphion-style head. Drawer also retained knob repeat traveler. The traveler now controlled Amphion components.
- Expression units, though now of Amphion manufacture, remained double-valve, i.e., primary and secondary. Amplifier still activated from treble stack only. Crescendo speeds remained adjustable; the external connecting tube remained.
- The term “long channel board” refers to complete (bass and treble) expression system mounted on one board as a single unit in grands. It was very difficult to access and service.
- The 1919 service manual specifically covers Type 3.

TYPE 4 –

Manufactured 1920

Chickering	132251	–	134000
Knabe	88000	–	91999
Haines	66382	–	69780
M. & W.	77601	–	98000
Franklin	77211	–	92691

Upright: Same as Type 3, except modified repeat device, single-valve expression ends, unit type, self-aligning center disc with S.K.F. bearing.

Grand: Same as upright

Elaboration:

- The Type 4 was introduced in early 1920 and marked the beginning of the Ampico A. It was made through early 1922.
- Upright tracking system redesigned; gets familiar bent rods with cap valves. Tracking system now shifted roll. Uprights would retain this design until superseded by studio upright top-loaders in the late 1920’s. These, as well as the top-loading Baby Ampicos of the late 1930’s, reverted to tracker ears used in the grands. These late top-loading Ampico tracking systems all shifted the roll.
- Grand tracking system same as Type 3.
- Modify switch (Brilliant, Medium, Subdued) made its first appearance; replaced Loud-Normal-Soft modifying lever.
- On the upright, the repeat, modify, Ampico and pedal switches were all located in the spool box on the left-hand side.
- The drawers had four switches inside the spool box on the left like the uprights.
- Repeat was now pneumatically incorporated with the shut-off system. Use of a mechanical traveler was discontinued.
- As Werolin noted above, expression units had single-valve actions which were of a newly-designed detachable “unit” type. The “spring pneumatic” moved from the lever board to the opposite end of the regulator valve-stem.
- Crescendo unit radically redesigned. Speeds remained the same (2-seconds fast, 11-seconds slow) but were no longer adjustable.
- The manual expression button system was redesigned one last time. Buttons were now coupled to pneumatic diaphragms controlling vacuum supply to respective intensity pneumatics.
- Unit valves now made from gum. Valve facings now cheaper vegetable-tanned leather.
- Amplification signals were now obtained from bass and/or treble, as compared to treble-only in prior types.
- As Werolin noted above a new, non-rigid precision bearing was used in the center of the pump spider to overcome prior

- problems. The new bearing could tolerate greater angularity.
- Covered specifically by 1920 Supplement to the 1919 Service Manual.

TYPE 5 –

Manufactured in 1922

Chickering	134001	–	135764
Knabe	92000	–	92798
Haines	69781	–	70979
M. & W.	98001	–	99807
Franklin	92692	–	93373

Upright: Same as Type 4.

Grand: New escutcheons, new junction strip, new-type drawer and drawer hanger and governor, new-type governor tubing.

Elaboration:

- Type 5 made from early 1922 to early 1923.
- First appearance of fancy gold-plated escutcheons in drawer. Four switches moved from inside spool box to top of drawer just left of spool box.
- Drawer now equipped with much needed stabilizer bar. Redesigned roll transport system in drawer. Tracking ears operate redesigned tracking system which shifted roll rather than tracker bar.
- “New-type governor tubing” refers to the three flexible 3/8-inch tubes (spring inserted) that are usually found in abominable condition.
- Went to solid wood felt-bushed connecting rods in the pumps on grands. These replaced the metal rods. With the wood rods came a new-design spider with square box containing dual bearings.
- No service manual covering Type 5 found to date.

TYPE 6 –

Manufactured in 1923

Chickering	135765	–	137876
Knabe	92799	–	95091
Haines	70980	–	72373
M. & W.	99808	–	102422
Franklin	93374	–	94289
Fischer	147675	–	148752

Upright: New-type pump, Bakelite primary valves.

Grand: New-type pump, new-type motor mountings, Bakelite primary valves.

Elaboration:

- Type 6 manufactured from early 1923 to mid 1924.
- J & C Fischer added to Ampico line!
- Covered by 1923 Service Manual.
- Upright loud pedal unit relocated to under the key bed on the bass side.
- “Bakelite” primary valve buttons. These would be but a brief experiment (rare). These were made of scrap from the phonograph record manufacturing process and not true Bakelite. Term used generically but not accurately.
- Grand pump motor changed from Westinghouse to Holtzer-Cabot which did not rotate in its mounting bracket. However, later DC motors in grands were usually Westinghouse, which also utilized new-style mounts.
- Internal pump feeder cavities made by partial saw-kerfs rather than complete cut-outs. Aluminum flap-valve grids in pump eliminated. Ports connecting each feeder to manifold

- now round instead of oval.
- Snubbing orifice added in tubing between re-regulators and their valves. This snubber eliminated potential oscillation in subdued mode.
- Late uprights got solid wood connecting-rods. Due caution should be exercised using pump connecting-rods as a dating indicator, as the late spring-loaded wedge rods were often retrofitted by service men whenever original rods caused trouble.

TYPE 7 –

Manufactured in 1924

Chickering	137877	–	139832
Knabe	95092	–	97436
Mason & Hamlin	33082	–	33440
Haines	72374	–	73482
M. & W.	102423	–	104968
Franklin	94290	–	95025
Fischer	148753	–	150158

Upright: Bakelite seats, new-type units and action stacks.

Grand: Bakelite seats, new-type units and action stacks, new-type rubber mounting pads for motor, iron clamp, spring belt.

Elaboration:

- Type 7 manufactured from mid 1924 to mid 1925.
- Mason & Hamlin added to the Ampico line!
- Grand motors get rubber mounts, replacing earlier felt mounts. Rubber mounts retained by iron clamps instead of wood used on felt mounts.
- First right-side-up unit valves in stack. Metal top-seats flared, limiting adjustment.
- Lower seats in unit valves made from scrap material from phonograph record manufacturing process. Same material used in roll spool-ends since 1911. Incorrectly called “Bakelite” by service personnel; Amphion referred to this material as “special composition”.
- “Bakelite” primary valves eliminated. Reverted to wood buttons used previously.
- Genuine Bakelite valve seats added to expression valves, crescendo valves and ancillary devices such as pump cut-out valve block, etc. These replaced the metal seats which were prone to corrosion from acids in leather.
- Grands still used “floppy-finger stack” but striker pneumatics shortened from 5-inches to 4-inches. No service manual found to date.

TYPE 8 –

Not identified in Werolin Notebook.

Elaboration:

- Type 8 manufactured from mid-to-late 1925 until Model B was introduced in 1929. Also used beyond 1929 on a selective basis.
- Introduction of roll-starting cut-out in left side of drawer. Avoided premature shut-off if paper did not fully cover port in take-up spool.
- Introduction of grand flange-finger stack with lost-motion compensation.
- Most uprights also got lost-motion compensation.
- Loud-pedal compensators added to most grands and uprights.
- Uprights got Holtzer-Cabot motor and new mounts.
- In the upright, the spoon-valve primary valve-block was

moved from back of spool box and combined with the shut-off valve-block. The new dual-valve block was identical to that used for reroll-repeat on the grands. This valve block was attached to the shut-off pneumatic. No tubing diagram for the new setup has been found to date, but tubing layout would be obvious to those skilled in the art.

- In the upright, the reroll cut-outs used during reroll and 88-note operation were eliminated. Retained was the reroll cut-out for the repeat mode.
- Spring-loaded wedges were used in wooden pump connecting-rods.
- Grand pedal-pneumatics moved from top of lyre to belly rail.
- Metal unit-valve top-seats modified with parallel sides to permit infinite adjustment.
- Some B-Type ball-check unit valves used as early as late 1926 for custom installations to save space over double-valve system. These early ball-valves still used the larger 13/16-inch A-Type valve disc and its proportionately larger lower seat.
- First Ampico B’s sold in early 1929. Ampico B Service Manual issued on May 1, 1929. Major Ampico B advertising appeared later that year introducing it as “The New Ampico”.
- Ball-type unit valves now equipped with the familiar 11/16-inch valve disc and smaller lower seat. (This smaller-sized valve and seat had previously been used in bleed-equipped unit valves for single-valve stacks in foot-powered actions used for both Amphion 88-note and many Marque Ampicos. Such foot-powered unit valves were also modified for use as re-regulator on/off switches in Types 4-8.)
- On the B’s, crescendo speed specifications increased significantly (one-half-second fast and 4 seconds slow); unit remained non-adjustable.
- Many late (post-1935) ball-type unit valves equipped with birch filter-cavity/elbow-nipple layer. The harder birch replaced the softer sweet-gum used previously and reduced possibility of damage (e.g., splitting wood when carelessly yanking tubing off elbow) during servicing. The gluing together of two disparate wood species is not normally conducive to long-term joint integrity, but the interface provided by the filter material apparently counteracted any negative effects of this practice, thereby helping to maintain airtightness over a reasonable service life. This benefit may have been inadvertent rather than intentional. The failure rate of the bottom-layer glue joint runs pretty much the same without regard as to whether sweet-gum or birch was used. Failure at this glue joint seems to be determined more by the filter material itself.
- Many additional changes incorporated in the Model B Ampico are described in detail in the 1929 Service Manual mentioned above.

NOTE: *There is ample physical evidence to dispute the accuracy of the serial numbers recorded. To fully explain that will be a story in itself.*