

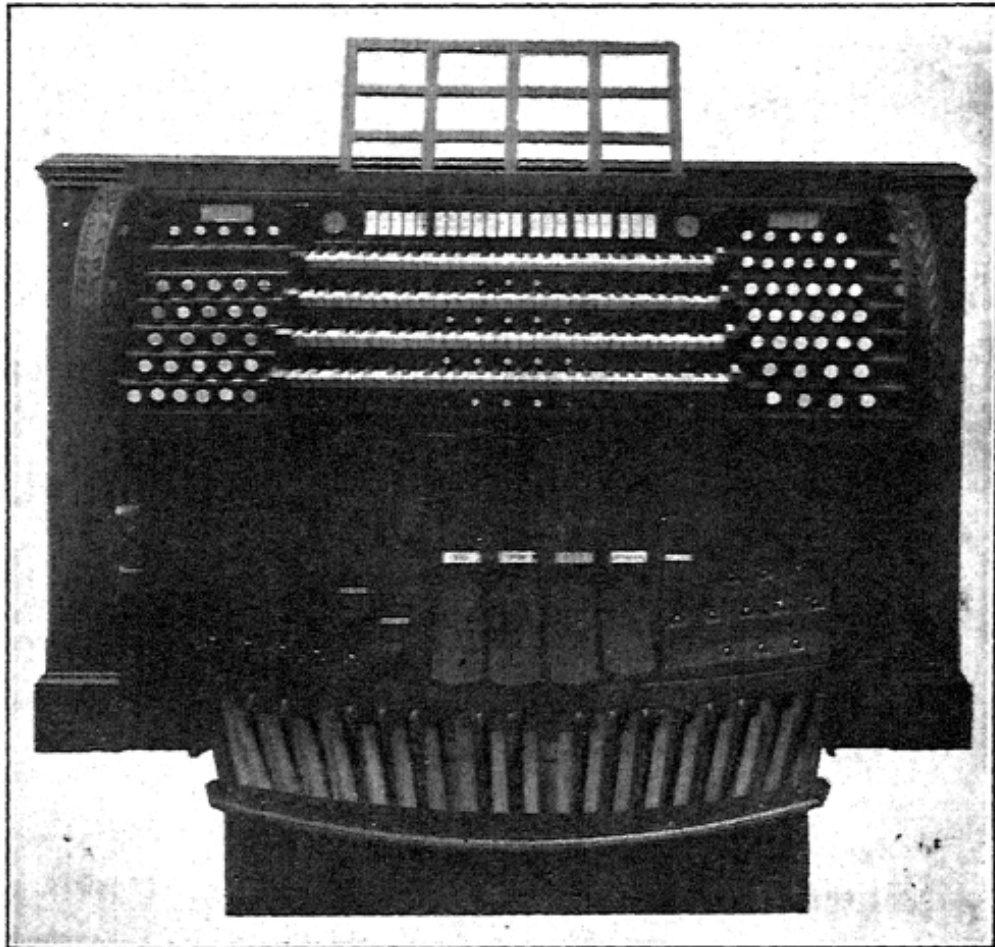
## CHAPTER VI

### THE USE OF COUPLERS

Consideration of those important mechanical aids known as *couplers* has been left until this point—as discussion of such a complicated subject prior to attainment of a fair mastery of the speaking-stops would in all probability only result in confusion to the student.

Couplers are mechanical devices by which different units or sections of the organ may be played from claviers or manuals other than their own proper claviers; through their use increased sonority is achieved—as the tonal resources of two, three or more units may be controlled as a concrete whole. With them varied and complex blending of tones, both in solo and harmony, is secured, and by their use not only are many unique and unusual effects made possible, but—with exercise of good judgment—it is possible to greatly alleviate inherent faults in the tonal design of the organ itself—faults such as improper balance of tone, and missing stops of special qualities.

An analogy may be drawn between the couplers of the organ and the electric switches in the lighting system of one's house; the lights in the different rooms may be considered as representing the different organs (Swell, Great, Pedal, etc.), the player himself may be likened to the main switch of the whole house—through which the energy is transmitted, and the couplers stand in the same relationship to the different organs and the player as do the individual switches in each room of the house. It is easy to see that the act of turning on the main switch of the house will have no effect on the lights in



CONSOLE WITH STOPS ARRANGED IN TIERS; COUPLERS CONTROLLED BY  
TILTING TABLETS  
(M. P. Möller, Hagerstown, Md.)



the different rooms if the individual switches controlling those rooms be left in the "off" position, and that in like manner the player may press the key to no avail unless the needed coupler be used to bridge the gap between the key-circuit and the particular section of the organ which it is desired to use. An electrician would speak

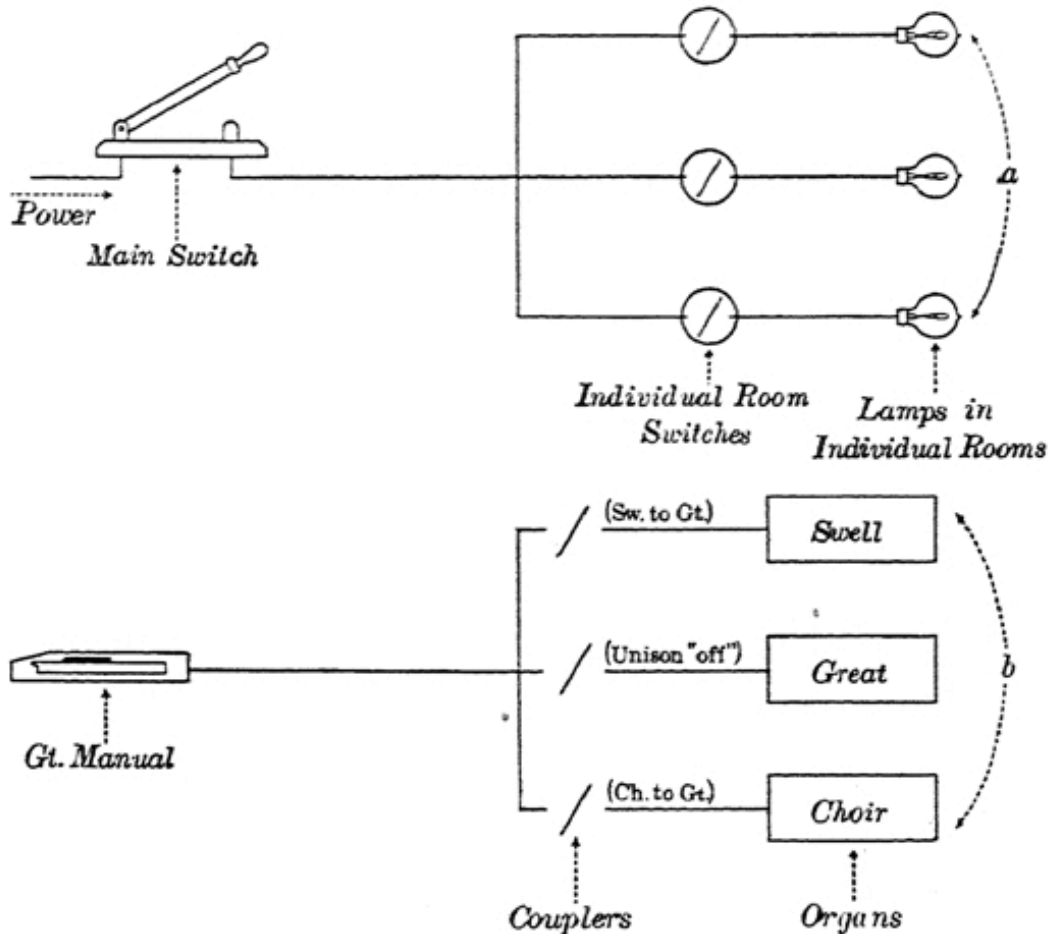


FIG. 11. ANALOGY OF ELECTRIC LIGHT SWITCHES TO COUPLERS

of the couplers of an organ as "gang switches" or *multiple-contact switches*—and in truth this is exactly what they are; they are *selective, multiple distributors* of energy.

There are two principal varieties of coupler: those coupling at unison pitch (operating the note of corresponding pitch on another unit as of the key depressed), and those coupling at the octave higher or lower than

the pitch of the key depressed—these latter being known as *octave*, or *sub* and *super couplers*. The effect of the different couplers is shown in Fig. 12.

Of the two kinds the *unison* couplers are, of course, the most constantly in demand, and are found in organs of every size; the octave couplers have of late years become a part of the equipment of all organs—

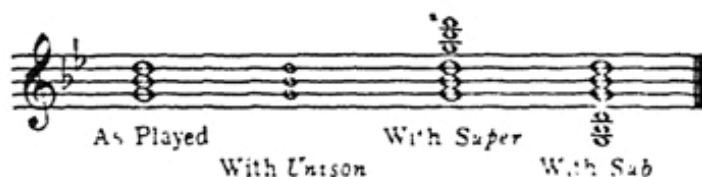


FIG. 12. EFFECT OF OCTAVE COUPLERS

even the very smallest—and are of great value in building up quasi-orchestral effects, unique and odd solo combinations, and also—it must be confessed—in securing increased power and brilliancy from the full organ. This latter use should not be required of them, but we regret to state that it is frequently necessary to put them to this use; the effect of the full complement of speaking stops should be sufficient in itself, and it should not be necessary to alter the supposedly scientific balance of the full-organ by the addition of sub and super couplers. Unfortunately the question of expense limits the specifications in so many cases that it is impossible to gainsay the fact that couplers must very often be used for the purpose of increasing the brilliancy and “smash” of the “full organ” of almost all small organs and indeed of many of medium size.

The unison couplers may be subdivided into two classes: those operating between manuals, and those serving to couple a manual to the pedals. The former bring under control of the hands the combined sonorities of two or more units, while the latter furnish the means whereby the pedals may control the proportionate and correct bass for the manual combinations in use.

The most commonly found manual couplers of unison pitch are these: *Swell to Great*, *Swell to Choir*, *Choir to Great*, and on the larger organs: *Solo to Great*, *Solo to Swell*, etc. In making your acquaintance with these devices remember in reading them to think of them thus: *Swell to Great*—the Swell organ coupled to the Great manual; also fix firmly in mind the fact that the part “to Great,” “to Pedal” gives the clue as to which manual or clavier will receive the tonal reinforcement mentioned by the first term.

No system for becoming familiar with the couplers will be laid down, and, in fact, none will be needed; their use is constantly directed in the registration of all organ music, and moreover—as the need for them is felt the student will instinctively experiment with them and will quickly find the proper one for the need felt.

With regard to the manual to pedal couplers a few words of advice may be given; the prime purpose of these couplers is to place under control of the pedals those notes—musically necessary—which cannot be encompassed by the player’s hands. Considered in another light—they supply resources needed to supplement the usually limited number of pedal stops, and as the pedal organ is usually deficient in both variety and 8 ft. pitch tone, it becomes necessary to use, for the most part, the bass of the manual tones in use at the time, supplementing this with a correct amount of 16 ft. tone (and 8 ft. if available) from the pedals. In this respect we work in a totally different manner from European organists who have—in most cases—sufficient pedal stops available to enable them to form their pedal registrations with but little recourse to couplers.

And so in general the student may be directed to form his pedal combinations by coupling the manual (accompanying manual if a “solo-stop piece” is in question) or manuals in use to the pedals—then adding such pedal stops as will bring up the bass to its proportionate

strength. As an example: when using the *full* Great organ, couple the *Great* to the pedals, then add such pedal stops as may be necessary to support this volume of tone—in all probability the *Open Diapason* of 16 ft., together with the *Violone* 16 ft., and 8 ft. *Violoncello*—if these be available, or perhaps the 16 ft. *Bourdon*, and 8 ft. *Flute*, depending—of course—on the power of the Great organ, and the selection of Pedal stops at hand.

When the proposition is such an one as a solo for the *Oboe*, with accompaniment on the *Great Dulciana* or *Melodia*, do not make the mistake so common among beginners of letting the *Bourdon* 16 ft. do all the work, but rather first couple the accompanying stop to the pedals, and then add the softest 16 ft. stop available (*Gedeckt*) to give the soft, unobtrusive but permeating foundation to support the whole. In the first case the result is one of “top and bottom”—and the pedal notes—being of low pitch—are exceedingly difficult to distinguish; in fact the result as a whole lacks pitch definition and clarity. In the second case the result is logically produced and will approximate scientific balance. As a practical demonstration of the folly of omitting the couplers (in the majority of cases) the following illustration has been included:

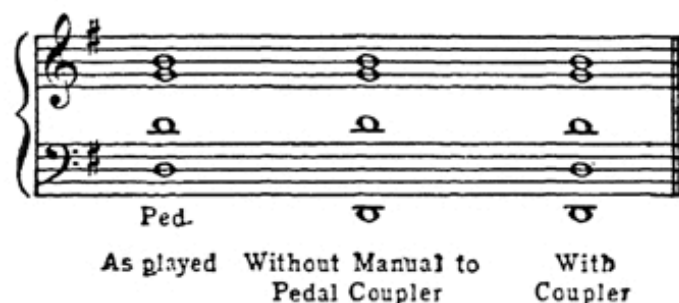


FIG. 13. EFFECT WITH AND WITHOUT COUPLER

Note in the second chord the tremendous gap between the manual chord and the lonely pedal note far below it—a result which can in no manner be construed as

good—transgressing as it does all the laws of scientific chord construction; observe how the coupler supplies the needed connection.

The uses of the sub and super, or 4-ft. and 16-ft. couplers—as they are often termed, will be learned most easily by the student devoting a portion of his time to experimenting with them—noting their effect on different combinations. While no rules can be given for their use, a few hints may be included which may help in comprehending their most effective uses.

First and foremost this advice may be offered: use sub- and super-couplers as producers of new effects among *soft* and *mezzo* combinations for the most part, reserving their use as producers of power and brilliancy for rare cases where absolutely needed. The English composer, Lemare, has—probably more than any other composer of organ music—pointed out the effects of most value obtainable with octave couplers, and his works should be studied for the light they throw on these matters; in his charming *Spring Song* (to note but one example) he directs that the accompaniment to the cello-like solo shall be on the Strings with *Gedeckt* and Super-coupler—an effect which—simple as it is, and not by any means novel today—seems to shimmer like the sunlight. In the forming of solo combinations such a grouping as: Swell Strings and 4 ft. Flute with *Sub-coupler* gives an effect which cannot be produced from speaking-stops alone. A very good example of sub-coupling on a melody is to be found in William Reed's *Intermezzo*.

Instances could be multiplied *ad infinitum*; trumpet passages such as fanfares are often rendered doubly effective by the addition of a sub- or super-coupler (rarely both) which coupler depending upon the *tessitura* of the particular passage and the amount and character of the accompaniment to it.

Cross-coupling of manuals on even a fair-sized organ



opens a tremendous field of color work; super-couple a combination from the Choir organ to the Great, sub-

## INTERMEZZO

Tempo I

WILLIAM REED

Chmp Clar. with Sub octave

MANUALS

*mp*  
Sw p 8' (without reed)

PEDAL

*cresc.*

*off sub octave*  
*rit.*

*dim.*

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FIG. 14

couple a Swell combination to the Great—use unison combinations from these manuals to the Great—or omit

one of them for sake of experiment, draw soft combinations on all manuals—with the Great and Choir slightly predominating, and the result will astound you. Pronounced orchestral effects are obtained by these methods, and enough has doubtless been said to lead you to experiment freely in this wonderfully prolific field of color.

On organs lacking a full complement of “upper-work,” *i. e.*, stops of 4 ft.,  $2\frac{2}{3}$  ft., 2 ft., and Mixtures, or perhaps only partially complete in these lines, you will be compelled to resort to the use of super-coupling to relieve the effect of “muddiness” and lack of brilliancy; do this with the most extreme moderation, however, and whenever possible *omit the supers*—if it be for only a few measures. Nothing is more wearying than long-continued use of super-couplers!

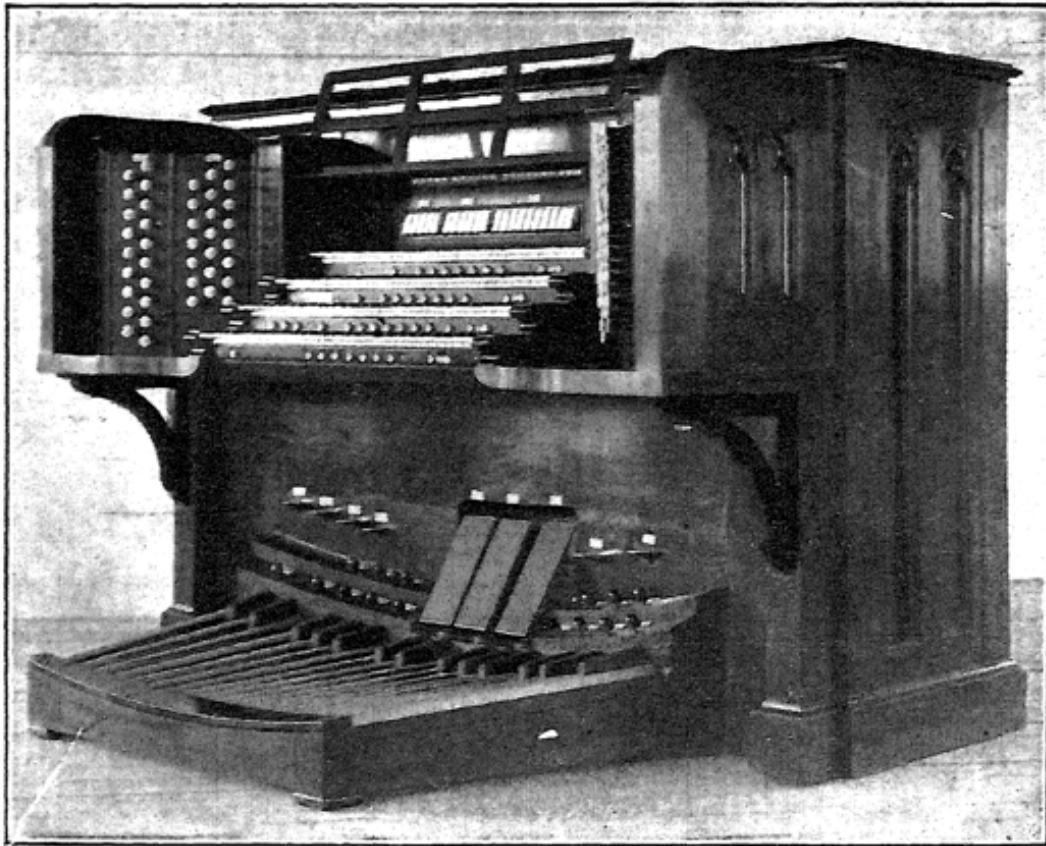
If you have a Swell organ of ten stops and if—as happens all too frequently these days—eight of these are of 8 ft. pitch, and the others comprise a 16 ft. Bourdon, and a  $\frac{1}{4}$  ft. Flute, it is self-evident that you must of necessity use super-couplers to a greater or lesser degree in very much of your work; it will be practically essential on almost all full Swell combinations, and with full Great combinations you will many times need to couple the Swell at the super-octave as well as at the unison pitch for the sake of brilliancy. Let your ear be the judge, however, and whenever the “lay” of the music takes you into the higher octaves of the claviers for any length of time try to do without the super-couplers if possible.

In leading and accompanying the singing of a congregation the slightest tendency to flatten in pitch should be the signal to you for additional higher-pitched stops or super-couplers; in the organ selections, however, the ear must be the judge as to the *clarity* of the effects being produced.

In like manner but in the opposite direction are the

*sub-couplers* useful—though not to anything like the extent to which the *super-couplers* are; should a combination seem “top-heavy” or “screamy”—as it is sometimes described—it is because there is wanting tone of graver pitch, *i. e.*, 16 ft. pitch, and you should supply this either by stop or coupler, preferably the former of course but using the latter where adequate tonal provision has not been made. *Sub-couplers must be used with even greater moderation than supers*; in general it may be said that *sub-couplers* are most useful on *solo* combinations, and *super-couplers* on *mezzo* effects in full harmony. But with all octave couplers it is wise to be most sparing, cautious and moderate.





FOUR MANUAL CONSOLE WITH SPEAKING STOPS ARRANGED IN JAMBS  
PLACED AT 45°; COUPLERS CONTROLLED BY TILTING TABLETS.  
(E. M. Skinner Co., Boston)

## CHAPTER VII

### CHOIR, SOLO VOICE AND HYMN ACCOMPANYING

As we near the end of our brief survey of the art of registration it seems well to include a few general remarks on the subject of registration in connection with the use of the organ as an accompanying instrument. In the work of the services of the church the student should at once realize that the organ cannot and must not be regarded as a *solo* instrument, for the obtrusion of personality is contrary to the spirit of things ecclesiastical; the organist must in this phase of his work be willing to submerge himself and his personal claims for attention as a performer, contenting himself with the knowledge that those among his listeners whose opinions he values will appreciate him at his true worth even though his service work be characterized by the utmost degree of self-effacement. The whole perspective in church service work is totally different from the requirements for recital work, and the remarks in this chapter must be regarded as bearing only on the former phase of the work.

We will consider the use of the organ in this work—First: In the accompanying of solo voices and the choir, and, Second: In accompanying the congregational singing.

The first attribute of a successful accompanist of both solo voices and also voices in groups is a *feeling for balance*—good judgment as to the proper volume and quality of tone to employ together with that subtle sense of understanding of a singer's needs which for a better term may be defined as "team-work." Moreover, the

really fine accompanist must know when to play the subordinate part, and when to assume the temporary leadership—"taking the reins" to save some struggling singer from disaster; this is a matter of instinct with some fortunate persons, but it can be cultivated to some degree by all. Extreme watchfulness in all relations between the instrumental and the vocal forces may in truth be urged, for then—if ever—are the calls upon the player most complicated; technical mastery of the instrument is almost imperative.

It may be asked what quality or qualities of tone are generically best suited to the different voices, and to this query a definite answer is virtually impossible; but it may be stated in a general way that predominance of Flute tone is advisable with many Soprano voices, that frequently it will be found well to rely mostly on Strings for support of Altos, that Tenors as a class are safely accompanied by a combination of Strings and Flutes, and that soft Reeds in combination with other soft stops are of value with many Bass voices.

Little more can be said. Voices are—like organ tones—of thousand-fold varieties, and the casual hints given above should be regarded as only suggesting the *predominating* tone to try with the voice. Much can be done however to alleviate deficiencies in the voice to be accompanied by a skillful selection of tones calculated to neutralize or relieve an unpleasant quality in a voice; with voices inclined to the hard, penetrating type it is well to be sparing with Reeds or Strings—relying mostly on full, round-tone Diapasons and Flutes, while with voices of a muffled, throaty or "fuzzy" quality a rather more decisive, keen quality of accompaniment may be desirable—thus supplying the element of definition lacking in the voice. Were the registration adapted with any other principle in view it would be quickly found that the unpleasant characteristic was only aggravated and rendered more noticeable.

Singers frequently wander from the pitch, and the organist can be of great assistance in such cases. If the trouble is a tendency to *flatten* it is a sure indication that more of the "upper-work" (stops of 4 ft. 2 ft. pitch) is needed; should the rarer *sharping* be encountered add more Reed and String tone, and during the interludes thicken the tone with Diapasons. In both cases slightly increasing the power during the interludes will help, and should the case be a very pronounced one it is wise to be fairly generous with the power supporting the singer—for a reasonable increase of power will often carry a singer through where a meticulous withholding of it might result in a complete and ignominious collapse! In the accompanying of *all* singers however, it is well to make your maxim that of giving support with *blending* tones—reserving the stops that *contrast* for more limited use in the interludes and in short thematic passages; variety, therefore, is to be sought only as secondary to support and aid for the singer.

The questions of fitting tone quality do not apply in anything like as great a degree to the accompanying of the choir (either the chorus or quartet forms) as is the case with individual singers; the problem becomes largely one of balance fittingly achieved and selection of quality or qualities of tone which shall make most effective the part assigned to the organ. If the music be so scored that the main interest is with the voices and but little of independent interest is given the organ, it is clearly the duty of the organist to furnish an *unobtrusive support* for the voices and nothing more than that! But, should the organ part contain thematic matter of independent interest (as is becoming more and more the case as composers are writing anthems of greater effectiveness)—then surely this part also should be so treated that it will prove interesting as well. The singers should not be submerged—far from it; but the player should cause his part of the composition to stand forth enough to be



realized—or as it has been put: “to *cut through* without overpowering”; this is best produced by a *contrast of quality*, whenever possible, and not through mere domination by strength alone.

Turning to the subject of congregational singing, and the accompanying of it by the organist, we are confronted by a matter of the utmost importance: the singing of the people, accompanied and led by the choir and organ is the musical backbone of the service.

The organist's part in the congregational singing is a two-function one: he must *accompany* and he must also lead. He must enunciate the tempo and rhythm—the two essentials of all singing by masses; he must see to it that the tempo he designates is adhered to—permitting no “dragging” whatsoever, and he should try to lead the people (in so far as is humanly possible) in bringing out at least the principal moods and meanings of the text of the hymns. By this is not meant that he should be ceaselessly varying the volume of tone, tempi and tone-color in that pernicious manner which has developed of late years—and which is often called “accompanying the hymns”—a procedure which is to be mercilessly condemned as theatrical, secular in feeling, and distracting and disturbing to the members of the congregation.

It is not necessary or artistic to give out one line fortissimo, following it immediately by a sentimental pianissimo on the next line; this is not art, indeed it is not even good taste! If it seems best to obtain variety by this line-by-line method let it be in the manner suggested in the registration of the hymn *Laudes Domini* as shown in Fig. 15, where it will be seen that the changes are of *quality* rather than quantity—thereby mirroring the spirit of the text and with all the volume will not vary in a greater degree than would be expressed by the marks *mf* and *f*. In brief, the congregation should be led to sing the hymn in the *general mood* and style of the entire hymn, and not in a petty line-by-line attempt

at interpretation; *Rock of Ages* demands one mood throughout, and *How Firm a Foundation* a totally different one. If the words demand a change of mood—then let the organ denote that change as subtly as a pool

## WHEN MORNING GILDS THE SKIES

LAUDES DOMINI

JOSEPH BARNBY

ORGAN

*f* (Gt. Full to Diapason, with Sw. -*f*. Open Sw.)

When morn-ing gilds the skies, My heart a-wak-ing cries

(Add Full Sw.) (Gt Diapason off)

May Je-sus Christ be praised A like at work and prayer

*f* (Add diapason)

To Je-sus I re pair: May Je - sus Christ be praised

FIG. 15

mirroring the changing clouds above it, with an almost imperceptible dissolving of one mood into another; sudden and unlooked-for changes are most disconcerting to the layman in the congregation and if persisted in will result in but one thing:—the layman will shut his

hymn-book and stop trying to sing—and this should be the last thing permitted to happen.

In “giving-out” the hymn some latitude in the matter of variety is of course permissible; we here give a simple registration for the hymn *Seymour*—showing what can be done in the line of varying the solo stops without resorting to abrupt dynamic changes.

## SOFTLY NOW THE LIGHT OF DAY

SEYMOUR

Arr. from WEBER

The musical score is divided into two systems. The first system includes staves for SEYMOUR, MANUALS, and PEDAL. The second system continues the MANUALS and PEDAL parts.

**Registration Changes:**

- MANUALS:**
  - Starts with *Gt. Gamba (Sw. to Gt.)* and *mp*.
  - Changes to *Gamba off add 8' Flute* in the second system.
  - Changes to *Sw. soft 8' stops* in the first system.
- PEDAL:**
  - Starts with *Soft 16' Sw. to Ped*.
  - Changes to *Add 4' Flute* in the second system.
  - Changes to *Flutes off, add Gamba* in the second system.

FIG. 16

With all quartet choirs and with the majority of small chorus choirs the author would urge that the leader adopt unison singing for most of the hymn work; the united volume and decisiveness of the combined voices singing the melody supported by ample volume from the organ will raise the standard of congregational singing in any church in a marvelously short time. Make no mistake: we do not urge that choirs of 40 to 50

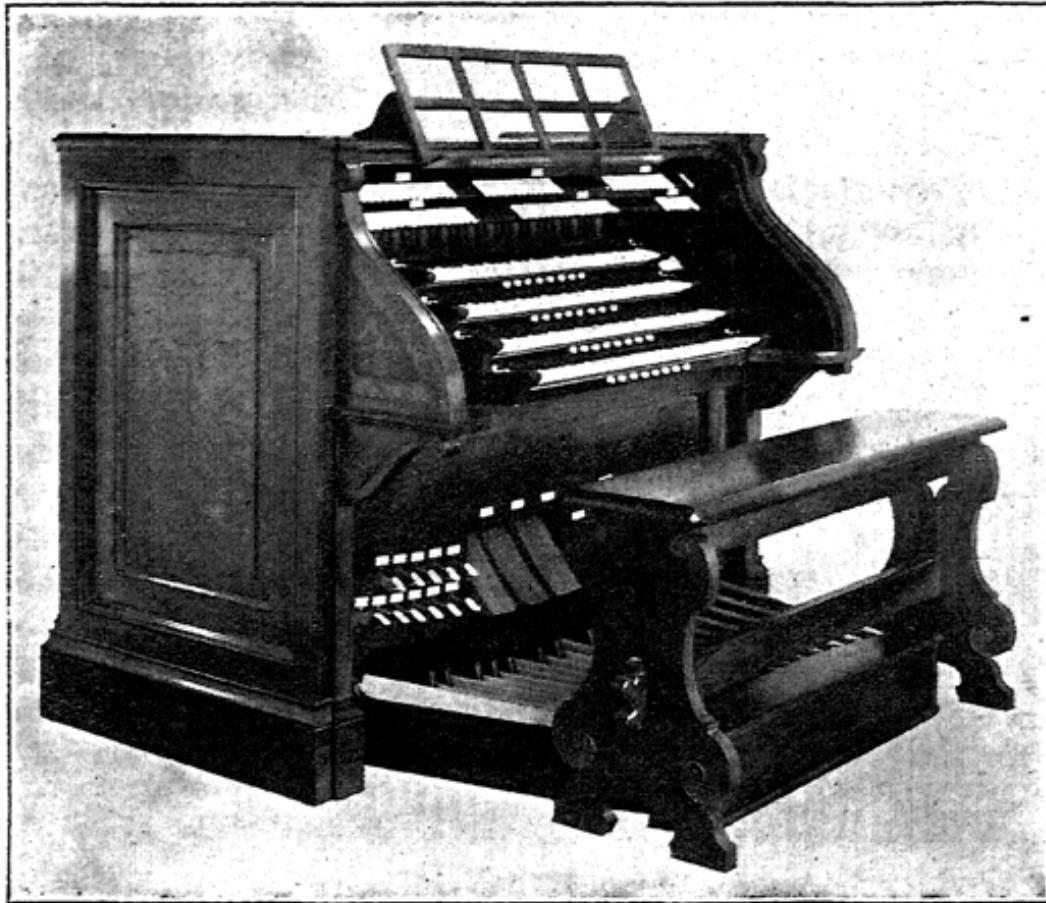
or more voices cease singing in parts, although even with such bodies of singers there are times when unison singing lends a majesty and dignity of effect simply overwhelming; rather do we plead that it is absurd to expect one soprano voice to furnish sufficient strength and leading power on the melody against three other voices and the organ. In fact with small chorus choirs (up to 16 or 20 in number) the leading power of the sopranos is so limited as to render the adoption of some other factor desirable; this factor will be discovered in the *united singing of the melody by all the voices*. There will be times when it will be desirable to transpose a hymn a tone or two lower to render it comfortable for the altos and basses, but this is more or less true of all hymns as sung in the ordinary manner, and so does not complicate the matter at all, and makes it much easier for the lay singer to add his voice to that of the trained singers in the choir-loft. The voices so united should be supported by a "fat" registration: Diapasons, Flutes—in both 8 ft. and 4 ft., as the foundation, with a judicious admixture of strings and reeds—together or alternately—to give the element of variety.

Such a heavy mass of foundation tone is really a necessity in leading the singing of the congregation; most untrained singers are literally afraid of the sound of their own voices and before they can be persuaded to attempt singing must be made to feel that there is sufficient volume from organ and choir to make it unlikely that their individual voices will be heard all over the church! The author hopes that those reading these paragraphs will not regard this as a plea for thundering blasts from the organ during the hymns; nothing could be less desired. The plea is for *support*, not *noise*; support enough to reach and reassure the timid soul in the last pew, but still not of such a nature as to deafen the ones in the front of the church. Virility, strong accent, rhythm, and ample volume of Diapasons and Flutes

(with little of heavy reeds)—these are the essential requirements.

And finally—do not become *standardized* in your registrations—satisfied with a few stock combinations to be used on any and all hymns. Try to make some slight variation in the registration of each hymn during a service; the practical combinations which may be used in accompanying a congregation are quite numerous. Super-coupling soft Swell combinations to the foundation tone of the Great organ opens countless beautiful effects and does so without disturbing the supporting qualities in the least. With these suggestions we leave the reader to study the matter for himself; we cannot urge too emphatically, however, the importance of giving careful study to these—and all other—details of church work, for after all it is in the church that the organ finds its greatest sphere of usefulness. True—it is fast becoming converted to secular uses and will probably be so used more and more with each passing year; but it is likely that the student will continue to find the most frequent opportunity for his work *in the church*, and the proper use of the instrument in church surroundings must be thoughtfully considered by all who would make a success of their work.





CONSOLE WITH INCLINED MANUALS AND STOP-KEYS CONTROLLING  
SPEAKING STOPS AND COUPLERS.  
(Austin Organ Co., Hartford, Conn.)

## CHAPTER VIII

### SOME PRACTICAL SUGGESTIONS

There remain some thoughts on registration which it has not seemed wise to include in any of the foregoing chapters, together with a few suggestions as to special but useful effects which should be added. These thoughts will be set down in no preconsidered order and must be regarded as hints to be referred to from time to time—especially during the frequent self-catechismal questionings which should be made a matter of routine by all musicians, young or old.

*First.* Endeavor to assimilate and incorporate in your work the principle of moderation in tonal changes; make it a cardinal rule to avoid unpleasantly sharp contrasts—laying-on or taking-off the color *in thin layers*, so to speak, rather than by applications of huge splotches thrown at the tonal canvas. This is, of course, only another plea for smoothness and technical finish, but it is a most important point.

*Second.* While bearing in mind the above point we would also advise the student to make a practice of sometimes *totally changing* the *character* of the tone in use—*without necessarily changing its volume to any extent*. As an example: during some selection you have been using combinations of strings and flutes for the most part; if the construction of the piece will permit, try using, during some passage, or passages, the totally different tone of the *Swell Open Diapason*, and note what an agreeable contrast is offered to the ear. Or, if you have been mainly using strings, try using the pure *Flutes* alone for a part of the piece; this occasional use of



prime tones is a grateful relief to the ear and furnishes valuable contrast to the more constant use of mixed combinations.

At first glance it might be thought that this suggestion and the one preceding are of antipathetic nature, but such in reality is not the case; the explanation is this: gradual changes are best for use during the progress of sections of a composition, while the sharp contrasts naturally are most valuable at those points where the natural sectional divisions of a composition occur. To illustrate: a composition written in "song form with trio section" will call into play both principles of registration, for during the progress of the first two or three divisions the registration should be of a *gradually changing nature* which moderation will meet with an effective contrast if—upon arrival at the trio section—the registration be *decidedly altered*, both as to quality and volume, and a reinforcement of contrast will be attained by a decided return to the tonal methods of the first sections upon the re-statement of them in the composition.

The plan of contrasting tones at the principal points of division of a composition has the desirable effect of aiding the listener in grasping at least the elements of the design of the composition. An effective use of the Solo *Tuba* for phrase contrast (which is only an elementary form of the sectional contrast we speak of) has been made in Richard Keys Biggs' arrangement for organ of Charles Fonteyn Manney's *Prelude and Christmas Pastoral* from "The Manger Throne"—the tonal contrast aiding and abetting the natural musical contrast of the phrases in which it is employed.

A similar treatment may well be accorded Marcus H. Carroll's *Festival March*—the first six measures being given to stops of the *Tuba* or *Trumpet* type, the Great organ entering with the chords of measure 7, thus showing plainly that the first measures are in reality an introduction to the main body of the composition which

PRELUDE and CHRISTMAS PASTORAL  
From "THE MANGER THRONE"

Prepare {  
Swell: Diapasons (Sw to Gt.)  
Great: Diapasons *ff*  
Choir: Full (Ch. to Gt.)  
Ped: *ff* (Coup to Sw. & Gt)  
Solo: Tuba

CHARLES FONTEYN MANNEY  
*Arranged by Richard Keys Biggs*

Moderato maestoso (♩ : 116)

MANUALS

Gt. *ff* Solo

PEDAL

*f* Gt. *ff*

Solo *ff* Gt. Solo

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FIG. 17

## FESTIVAL MARCH

Prepare { Great: Reeds and Foundation Stops 8'  
 Swell: Full  
 Choir: Flutes 8', 4'  
 Pedal: 16', 8'

MARCUS H CARROLL

Tempo di Marcia

MANUALS

PEDAL

Gt coup to Sw

Full Sw

stacc sempre

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FIG. 18

follows. Instances could be multiplied indefinitely but enough has undoubtedly been said to illustrate the worth of this simple principle.

*Third.* Learn *when, and when not* to use tremolos and stops of the Celeste (vibrato) type; for many years it has been the fad of purists to practically insist that these stops were the desolation of all that was abominable—a viewpoint not without some foundation when based on early specimens of the stops in question. However, with the present perfection of the tremolo and the various beautiful String and Flute Celeste stops these mandates can well be relegated to the forgotten past; the modern tremolo is in reality a slow-speed vibrato—quite different from the old fluttering-bird-wing devices, and the Celeste stops infuse an orchestral warmth in the same way as the duplication of string instruments in the orchestra produces a “liveness” of tone attainable in no other way. It may well be pointed out that the tremolo is most desirable with those stops which in the orchestral instruments of which they are the representatives are naturally susceptible to vibrato treatment, viz: the String stops (*Cello, Viol d’Orchestre, Viol Celeste, Vox Celeste*). It is particularly desirable also, that when playing transcriptions of music written for the orchestra the tremolos be omitted from the stops representing the wood-wind band (*Oboe, Clarinet, Bassoon, English Horn, etc.*)—thus preserving more nearly the natural color and technic of the original; note that we do not advise that the tremolos be unused with these stops as a general practice, but *especially and particularly with orchestral transcriptions*. It is also the part of wisdom to omit tremolos during passages of short and rapid notes—as the occasional conjunction of some of the short notes at the exact moments when the tremolo is releasing a puff of air will often result in faulty speech or incorrect intonation from a reed pipe; naturally therefore, tremolos are most effective with long, flowing and expressive

melodies—such passages as a violinist would naturally treat with considerable of the “wrist-vibrato.” Our best players are making use of these stops to an extent undreamed of even by performers of a generation ago, and too much thought cannot be given to their artistic use.

*Fourth.* In playing passages which lack inherent rhythmic interest—*i. e.*, passages of notes of the same time value, etc.—use an expressive division of the organ, or such a division *coupled* to an unexpressive one if the latter be thought necessary; the reason for this should be self-evident: to substitute for the lack of rhythmic interest the delicious dynamics produced by the *expression levers*. The modern organ—in common with all instruments of true artistic capacity—offers ample facilities for shading and there is absolutely no justification for continuance of the methods which were fostered by and which were the result of the limitations of the organ of a generation ago; therefore, you should not be content to pursue archaic methods when more artistic ones have been made possible. Make your playing as *expressive* as that of any other solo instrument.

*Fifth.* Try to make your console manipulations in a systematic manner; avoid a wild and fluttering uncertainty of the hands—here, there and everywhere among the stops and couplers! Plan just what changes will be needed at each point in a composition and then arrange a logical order for making them. Try to work around from one side of the console to the other, or from the center out (fan-shape) or, occasionally, from the extreme edges in toward the center, etc. Perhaps the changes will be partially accomplished by use of pistons: if so decide with which hand the pistons shall be manipulated; if two pistons must be used at nearly the same moment *decide which one* shall be used first, and if couplers are also to be changed plan in advance whether the stops or the couplers shall be changed first and which hand can best be spared for the operation.

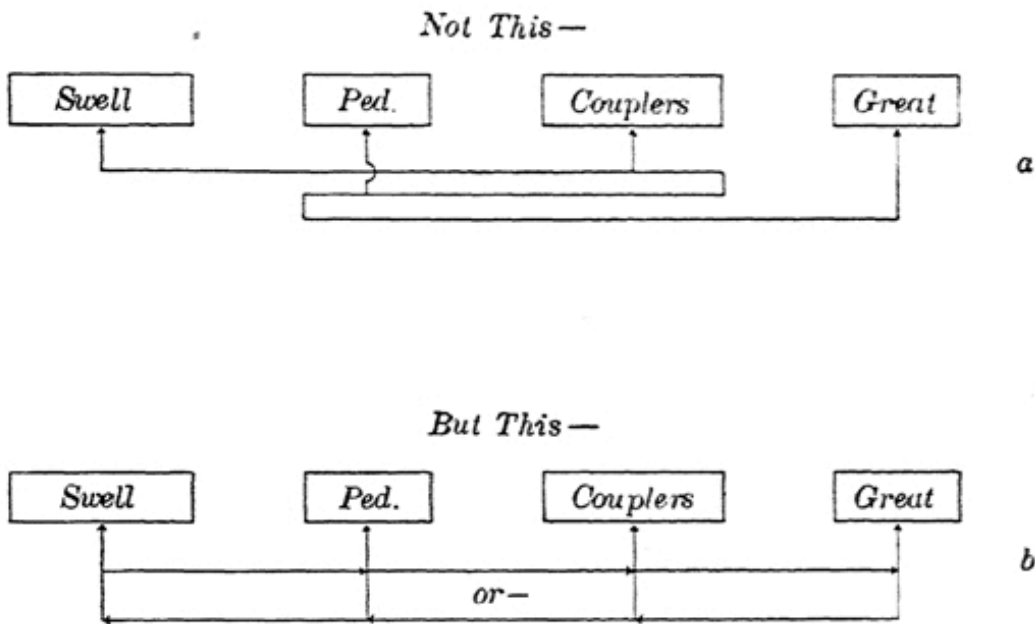


FIG. 19. (a) INEFFICIENT AND (b) EFFICIENT MOVEMENTS AT THE CONSOLE

A quiet demeanor at the console is most restful to the observer, and unquestionably tends to inspire confidence in the members of the choir; a choir can be thrown into confusion by the sight of their leader floundering among the stops in nervous uncertainty. It is much better to limit your registration changes to the irreducible minimum—making those only which you can make with sureness and speed—than to run the risk of breaking the rhythmic flow of the choir selections, for even a trained choir can be badly disconcerted by even a very slight *unexpected* pause.

*Sixth.* Avoid uneven and spasmodic use of the expression levers. It is trite to direct that swell pedals be not “pumped”; however, many students fail to realize that the vital point of the matter is that it is not necessary to open the box to its widest limits every time it is desired to make a crescendo! Your teacher will undoubtedly see to it that you do not acquire the vicious pumping habit, but you, yourself, must be always striving to attain mastery of the more *delicate* and *subtle shading* made possible by the modern swell-box—“The

Soul of the Organ"—as it has been rightly called. Make no mistake: we are not directing that the swells be always used for gradual crescendos—quite the contrary! One of the most valuable possibilities of the modern electric swell engine is the ability to produce short, emphatic *sforzando* accents by quick pressure and immediate return of the pedal through a short distance. What we aim to make clear is the vital fact that it is not necessary *nor desirable* that the swell-box be completely opened and closed every time it is desired to make use of it; rather may it be said that the swells should be used with *considerable frequency*—but with *extreme moderation* in the *degree* to which they are used.

*Seventh.* If the pistons on your organ are of the adjustable type set on them the combinations for which you will have most constant need; it is well to have ready for instant use several pistons with combinations of general use in connection with choir and congregational accompanying. A couple of pistons set with stops for hymn playing are exceedingly handy—especially where the service moves rapidly and there is little time for hand setting, as for instance where a hymn follows immediately upon an anthem. Do not set many pistons with loud combinations; leave the last stop or two (the most powerful as a rule) for adding by hand, or by crescendo or *sforzando* pedal. By doing so you always have something left, after running-up on the pistons, for a final addition to the climax; a more gradual crescendo and diminuendo is thus possible than where the full organ is set on the pistons themselves. Should the pistons be of the non-adjustable type—happily becoming rarer with every passing year—you will be compelled to rely more upon hand manipulation, using where possible a piston drawing nearly what you require and then altering by hand the stops drawn by that piston. Use the flat of the hand, the back of the hand, or even the wrist at times, in making changes; it is often possible

to so spread the hand that with one motion as much can be accomplished as would require two or three motions of the fingers in the conventional position.

*Eighth.* When you have passed the novice stage, do not be afraid to completely alter the registration of a composition if you can find one better suited to it on your particular organ. The chances are that the composer—were he to come to your organ—would himself use a very different scheme of registration from the one indicated on the printed copy; knowing the manifold variations in voicing of organ stops and the innumerable differences in specifications and equipment of organs, composers are virtually driven to indicating upon their works only the most general and superficial hints as to the registration desired. Regard all indicated registrations as clues only, not as hard-and-fast commands to be slavishly followed; the tempo, *tessitura*, mood, degree of complexity, etc.—all these factors must be taken into consideration.

*Ninth.* Although this is not a textbook of organ playing in general, the author cannot refrain from making a plea—in closing—for greater *clarity* in playing. *Clarity*—that essence of all fine art, without which the efforts of the most heav'n-endowed genius stand for naught! Co-existent with striving for good *effects* should be an equally strong desire for clean-cut phrasing, accurate finger work, clear "live" pedaling, a staccato touch which "ripples," a pearly semi-staccato, a legato which connects but does not overlap—in short, all the technical details that taken together consummate in artistic organ playing. The day of slipshod, muddy playing has gone, and in its place we find the day of modern technical methods as applied to the organ; it can safely be stated that no organist—however highly endowed by nature—can, in this day, reach to and continue to hold any considerable degree of success unless adequately equipped technically. The wide scope of usefulness for the King of Instruments has opened



a vast field for players well equipped, and the sphere is still broadening with each passing year; to those of requisite ability and equipment the modern organ offers a scope of usefulness equal to that of other solo instruments and in keeping with its inducements as a solo instrument by its own right.





STOPS AND COUPLERS OPERATED BY TILTING TABLETS.  
(Wirsching Organ Co., Salem, O.)

## CHAPTER IX

### THE CRESCENDO PEDAL

The Crescendo Pedal is perhaps the least understood and worst manipulated accessory of the modern organ. It is constantly used in places and ways in which it should not be. The result is that strong prejudice has sprung up in certain quarters against the crescendo pedal, *per se*, whereas the criticism should be directed toward the abuse of the pedal and not hurled at the innocent accessory itself.

As an extreme example of prejudice developed to the point of a fetish may be instanced the attitude of a famous English organist who requires the crescendo pedal on all organs on which he performs to be locked firmly, so that by no possibility can the pedal be brought into use.

It is an open question whether or not the name Crescendo Pedal—in so far as it applies to the majority of organs—is not a misnomer; in connection with an organ of few stops it is really a farce, because in all small organs the *breaks* caused by the wide difference of scale and power of some of the stops render anything like a smooth crescendo impossible. Moreover the order of arrangement of the stops adopted by some builders is quite inartistic. On large organs it is possible to plan a fairly smooth crescendo of stops, and in such cases the name is more justifiable.

Sub- and super-couplers should rarely if ever be included in the range of the crescendo pedal, and it is an open question whether the same may not be said of the heavy reed stops, *i. e.*—solo reeds. String stops also,

indeed all stops of highly individual quality, should also come on very near to the end of the crescendo rather than at the beginning. Where the pedal is made adjustable, as is sometimes the case, the organist will be in a position to work out by experimentation the most perfect crescendo possible.

But as a rule the organist must concern himself with making the best use of the accessory as he finds it provided for him. So let us inquire into the best usage of the device.

*First:* Regard the crescendo pedal more as a means of producing "graduated accents" than as a purely crescendo builder. The occasional *sforzando* or accent is of the greatest value in correcting the tendency of organ music to be devoid of vitality. A *sforzando* may, of course, be of any degree of power greater than the volume which has been in use prior to its advent; it need not be of *ff* strength—far from it! The average of power in use during a certain section of a composition may have been not greater than *mp*, but a *sforzando* will be produced—just as truly as if it were on a larger dynamic scale—if there is added for an accent touch merely an *mf* degree of power. Or to put it another way: the addition of a *single stop* will produce a degree of *sforzando* for a soft combination just as truly as will the addition of three or four reeds to a *ff* full Diapason organ. It is truly remarkable how much our best players are using the crescendo pedal for this *sforzando* work, and it is probably in just this field that its greatest usefulness lies.

Moreover the crescendo pedal is, by reason of the facts stated above, of vastly greater value than the totally misnamed *sforzando* or—in reality—*full organ* pedal; this latter accessory is of no value whatever other than that it gives instantaneous command of the full organ. With it only one degree of *sforzando* is possible—and that the most powerful; naturally this limits its usefulness to the moments when great power is needed—

and those moments are rare. The crescendo pedal, on the contrary, presents a large number of possible degrees of accent from the softest to the very loud.

*Second:* A very excellent usage of the crescendo pedal is in connection with passages in sequences, where—with each repetition of the sequential passage or phrase—an increase (or decrease, as that use also is possible) is given to the volume of tone employed; the addition of tone will be needed most often with rising sequences, and the subtraction with falling ones. Both should be done with great moderation, and not too frequently.

*Third:* Crescendo by chords, that is, minute increases of power with each chord, or with the strongly accented chords of each measure, is also possible, and often relieves the monotony of passages made up of chords of the same time value.

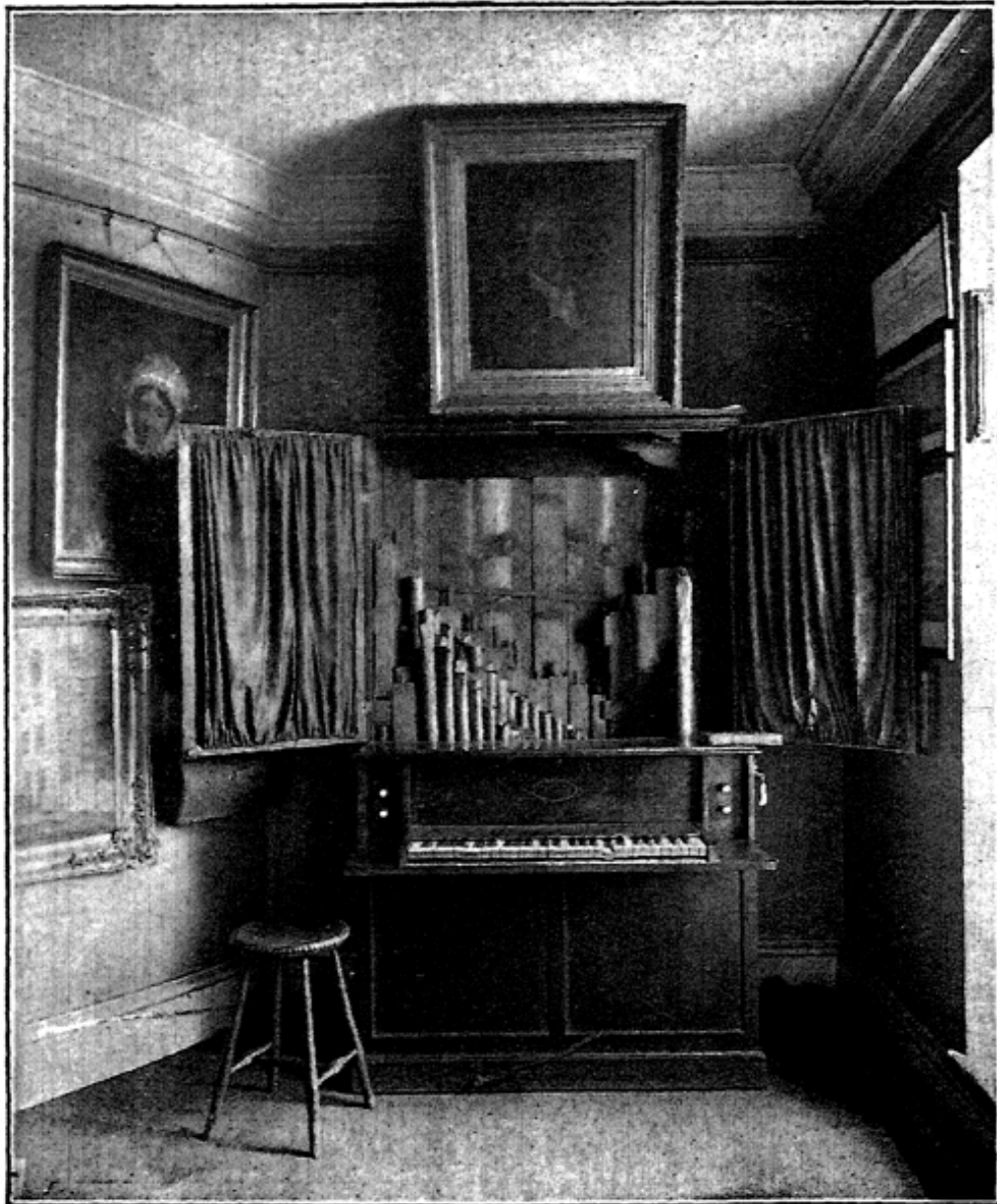
*Fourth:* Do not use the crescendo pedal to obtain *mf*, *f*, and *ff* degrees of power for any extended periods; the lazy habit of doing this instead of manipulating stops has been the cause of much of the criticism of the device. It is evident on a moment's thought that if this is resorted to there will be produced a most stereotyped effect; the quality of tone produced is invariably the same at any given point in the progress of the pedal. Rather obtain the effects for use for any length of time by means of stops (pistons if necessary) and thus reserve the crescendo pedal for its most effective function, *i. e.*—as a producer of accent and *sforzando* effects. There lies in this course at least the chance that the effects will be varied, but if the former procedure be followed even that chance is eliminated.

Analysis of these points will reveal the fact that they are based on the premise that the pedal is only an *accessory*, and not something to be fallen back upon because of lazy habits. It must not be thought of as a short cut to registrative work, for such it emphatically is not. It is not a device for eliminating hand manipulation

of the stops. It is first and foremost a producer of graded accents, and secondly—and to a much less important degree—a builder of crescendos and diminuendos, and it must be regarded in this light if it is to be artistically used.







**OLIVER HOLDEN'S ORGAN**

(circa 1790)

## CHAPTER X

### A GLANCE AT ORGAN CONSTRUCTION

In this chapter we will endeavor to give you an insight into the mysterious functioning of the interior mechanism of the modern organ. From a purely mechanical standpoint the organ is unapproached by any other musical instrument in complexity, variety of application of energy and number of mechanical motions employed. The modern grand pianoforte, with its beautifully perfect action, is not of one-twentieth the complexity of an electro-pneumatic organ, and yet—as Sir John Stainer truly states—“The history of the organ is nothing more than a narrative of the efforts of men to bring under the control of one performer a large number of the instruments called flutes.” How well this effort has been realized may be judged from the fact that the largest organ in the world at the present time (the great organ in the Wanamaker Store, Philadelphia) contains 29,000 pipes, all readily controlled by one player!

In marked contrast to this mammoth instrument is the little organ of Oliver Holden, the composer of the hymn-tune: *Coronation*. Because of its unique historical value we include a reproduction of this early organ. Holden was a carpenter and joiner by trade, but dropped his tools to become a teacher of music. This organ, of which he was extremely fond, dates from about the year 1790, and is now in the custody of the Bostonian Society in the Old State House, Boston.

The first requisite of an organ is an ample and steady supply of wind with which to blow the various pipes. For many years this has been produced by a *bellows* and

*double feeders*, these latter operated by either human muscles or by a water motor, steam or gas engine—the final application of the power being the same in all cases. As will be seen in Fig. 20 the contrivance consists of a horizontal frame surmounted by a series of flexible folds, quite similar to the folds of a *Concertina*—these latter supporting a top board on which are placed weights or springs to restrain the upward motion of the top board and thus confine the wind under pressure. Below the horizontal frame, generally called the *trunk*, are to be found the *feeders* which are smaller replicas of the construction above the trunk; these feeders are moved up

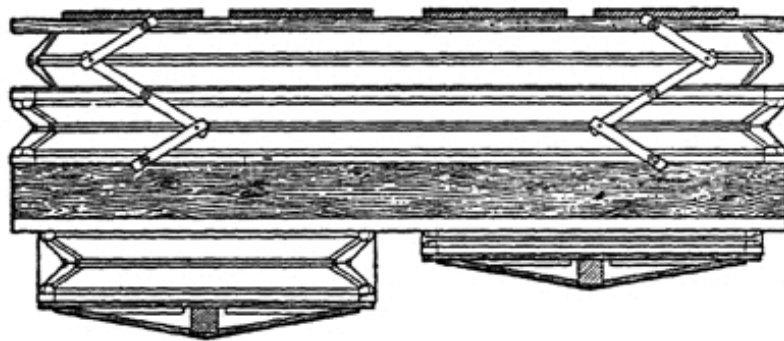


FIG. 20. BELLOWS AND FEEDERS

and down by the particular power source in use, and function in the same manner as the simple hand bellows used by our ancestors in starting a wood fire in the grate. With each upward motion the air is compressed and forced into the trunk and reservoir; during the downward stroke the feeders are again filled with air which is again delivered to the reservoir above, this cycle being repeated as long as the organ is in use.

The desire for a more steady and unshaken supply of wind for the organ led to the introduction of the modern *Centrifugal*, or *Fan* blower, and this type of wind supply has become the generally accepted equipment for all modern organs. Several styles of this machine are in use but the principle of all is the same, *viz*: a rapidly

revolving fan, or series of fans, the air being taken in at the center of the fan and delivered at the circumference. Fans of the same type may be seen in use forcing air into subways, coal-mines and in the heating systems of some large buildings; any desired pressure may be obtained, and the supply is of absolute evenness. With this type of blower the necessity for the *feeders* disappears, only a

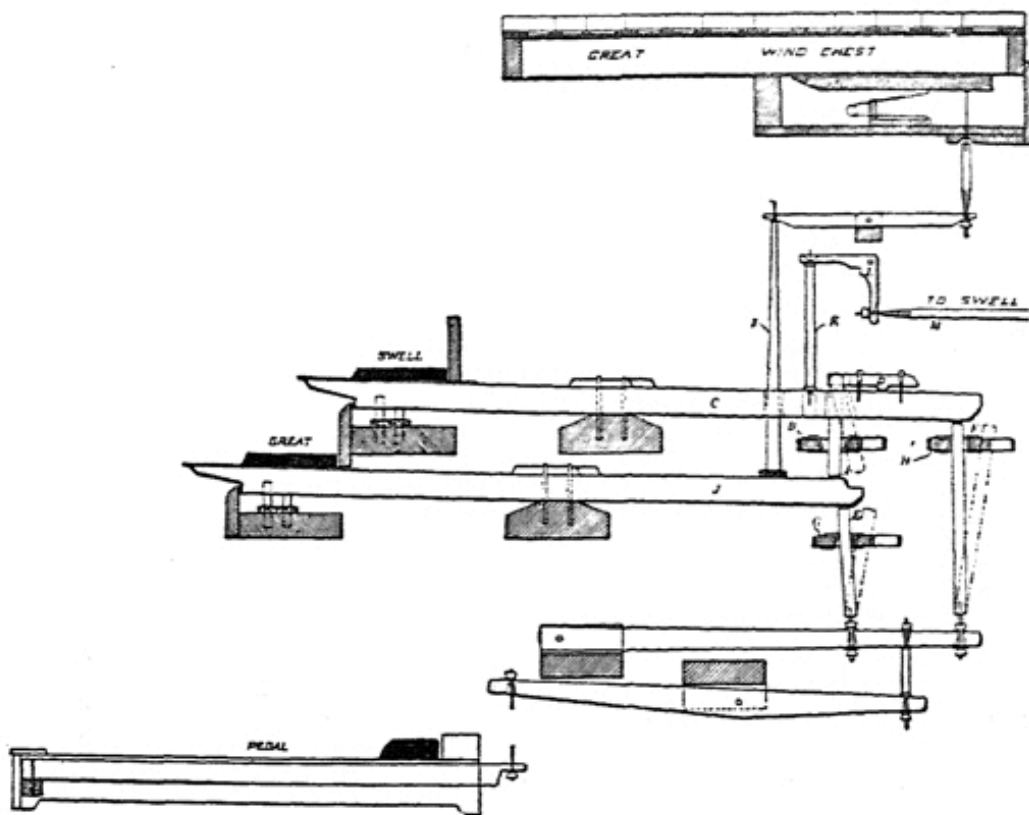


FIG. 21. TRACKER ACTION

small reservoir being required for the control of the wind.

From the bellows or reservoir the wind is carried by wind-trunks to the various *chests* upon which the pipes of the organ are planted; these chests are shallow boxes of varying dimensions containing valves and other mechanism for governing the introduction of the air to the individual pipes. The early method of controlling these valves from the keyboards was by a series of

sticks, levers, wires, etc.—known collectively as the *tracker action*.

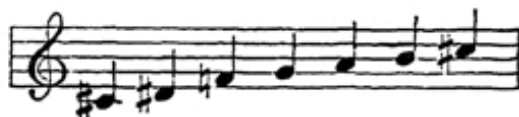
It is not our purpose to enter into an exhaustive discussion of this action; it was for many years the one and only action for the organ. It has undoubtedly served its purpose, and served nobly, and we may remember that the action of the organ of Bach's day was of this type; but it is—as far as construction of new organs goes—a thing of the past, and its interest for us now is mostly historical. In Fig. 21, we show a drawing of this action as introduced in a two-manual organ.

The drawing shows clearly the arrangement of the different levers utilized; the dotted lines used in three places indicate the position of the coupler *stickers* when the coupler is in the *off* position. It will also be noticed that because of limitations of space the *chest* for the *swell organ* is not indicated; this chest is exactly like the one illustrated and would be placed to the right of the great chest in the illustration.

While on the subject of the chests it may be well to state that the pipes are not arranged, in the best organs, in the same manner as the strings of a pianoforte, *viz*: in regular chromatic order from lowest note to highest, but are usually placed alternately on either side beginning at the ends of the chest with the largest pipes. This means that the pipes slope upward from the smallest pipes—which are in the middle of the chest—to the largest which are on the ends. The order on one side is this:



and on the other side this:







GREAT ORGAN IN MUSIC HALL, BOSTON, 1863.

This fact is worth noting, as, if you are ever compelled to tune an organ, or are requested to hold keys while a tuner is at work, it will be in the above orders that you will be required to do it; much time would be lost if an attempt was made to tune upward in straight chromatic order as the tuner would be obliged to move back and forth from side to side with each new note!

About sixty years ago the first successful attempts to remedy the manifold defects of the tracker action were consummated; the tracker action—heavy, lacking sensitiveness and quick recovery—had long been a bar to the growth of the organ, limiting decidedly the possible number of stops which could be played by an average human being, and also barring progress in tonal improvement which it had been vaguely foreseen was possible through use of heavier wind-pressures.

It may be noted that at about this time there was built the first thorough concert organ for this country:—the great organ in Boston Music Hall. This instrument was formally opened on November 2, 1863, by a notable group of recitalists, including B. J. Lang, John K. Paine and Eugene Thayer. The organ contained every known feature and accessory of artistic worth and was, for its time, a remarkable instrument; but so great has been the development of the powers of the modern organ as a concert instrument that this marvel of the sixties would be regarded as a very limited vehicle of expression by a present-day recitalist. Truly, the expansion of the organ in the last fifty years has been a process of startling rapidity.

There were then introduced the first forerunners of the recent *tubular-pneumatic* action. The principle of this action is, crudely put, this: that if pressure be applied to the air in a tube at one end of the tube, the same pressure—roughly—will be available at the other end of the tube. It is this principle which permits piping gas and water through our streets to our houses.



In the organ the tubes are provided, one for each key, manual and pedal, running from the keyboards to the chests; they are generally of small diameter—the size of a thin lead pencil—and made of lead for easy bending around corners, etc. By utilizing a puff of wind in these tubes a valve in the chest is opened and the chest action set in motion just the same as if a tracker were employed—and with no more exertion to the performer than would depress the keys of a pianoforte.

The system most generally adopted at the present time is known as the *exhaust* system, and is satisfactory when used in situations where the console is not placed at any

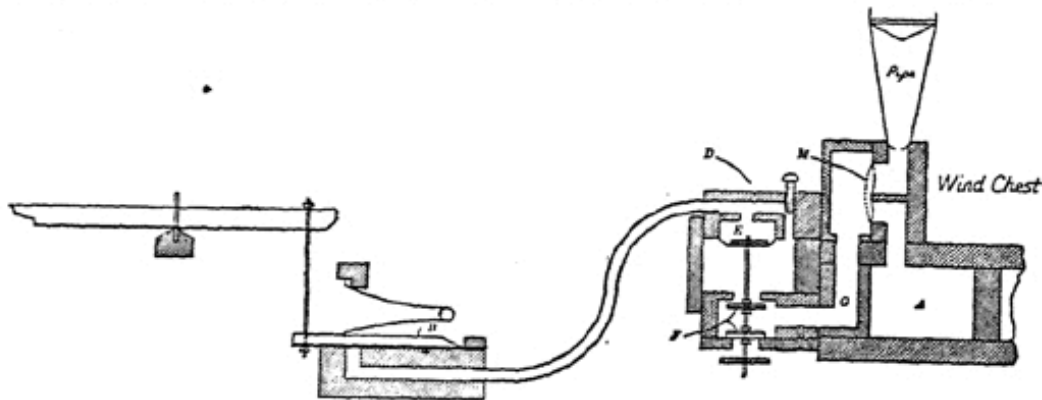


FIG. 22. TUBULAR-PNEUMATIC ACTION

great distance from the organ proper; this system presents the advantage of having the fewest moving parts, and gives very little trouble. It is illustrated in Fig. 22.

The tube connecting the key and the chest is kept full of wind from a small *bleed-hole* (controlled by the set-screw which can be seen on top of the chest) except at the times when the key is depressed by the performer; when this is done the wind in the tube exhausts (whence comes the name of the action) and the pneumatic *E* raises, carrying with it the double valves *F*; the change in position of these valves releases the air in the chamber *G*, the diaphragm *M* being allowed to bulge into the channel *G* and thus permit the air in the chest to pass

from the chamber *A* into the pipe. When the performer releases the key the cycle of actions is reversed and the action resumes the position shown in the drawing—silencing the pipe. In a perfectly designed and built action this cycle can take place very rapidly indeed, providing only that the tubes be not of too great length. The greater part of the little regulation needed by this action can be secured by slightly turning the screw governing the aperture of the bleed-hole mentioned above; outside of the chance that a speck of dirt may lodge between the valve and the valve-seat there is little or nothing about this action to get out of order.

With the introduction of electricity into the mechanism of the organ began the period of its greatest development as an instrument worthy of a great artist. The idea of using this force in the action of the organ originated, curiously enough, about the same time as the inception of the pneumatic action, but the first electric action organ in this country was not built until 1878, when Hilbourne L. Roosevelt introduced it into his organ in Grace Church, New York City. Since then it has undergone a constant refining process, the late Robert Hope-Jones being one of the figures in its development, and it is now the only action employed in instruments of any calibre and is being increasingly employed in even very small organs; it is instantaneous—no matter how far the console and organ may be separated—repeats with lightning-like rapidity, and when well made is quite as reliable as the tubular-pneumatic action. It is now the exception to find a modern organ with any other action.

In Fig. 23 will be found a sectional view of the main elements of a modern electro-pneumatic action.

It will be noticed that the action much resembles the tubular-pneumatic just discussed—the tube and key-valve being missing, and in their place a magnet, armature-valve, contacts, battery and wire being found.

Depressing the key closes the circuit at the key-contact *N*—just as the act of ringing an electric door-bell is accomplished—and energizes the magnet *L*; this causes the small metal armature-valve *H* (a thin circular wafer of metal) to be attracted to the magnet *L*, and in rising it uncovers the vent *K*. This vent being opened to the outside atmosphere the wind from the pneumatic pouch *E* exhausts through the vent—drawing upward the double-valves *F*—from which point the cycle of operations is the same as with the tubular-pneumatic action described above. When the key is released the electric circuit is broken, the magnet loses its power of attraction, the

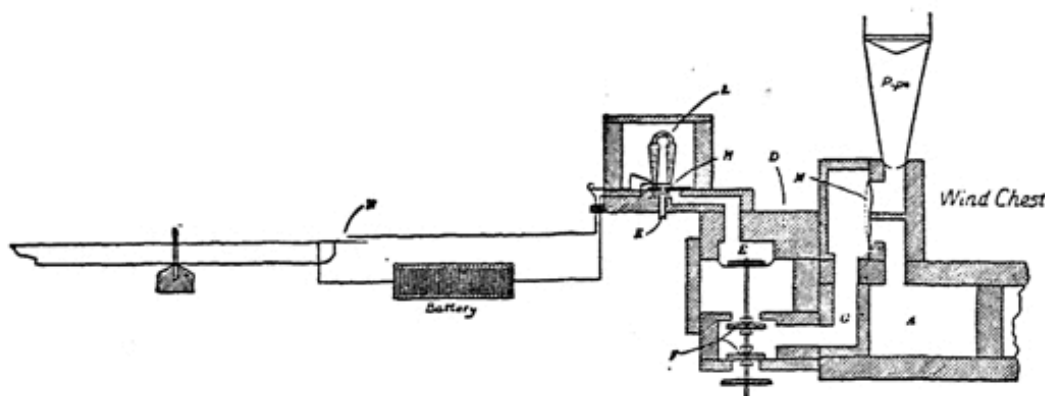


FIG. 23. ELECTRO-PNEUMATIC ACTION

armature-valve resumes its position over the exhaust-vent *K*, and the action resumes the position shown in the drawing.

In the modern organ it should be understood that the current is furnished, not by batteries—as was the case in the early experiments—but by a small dynamo, or generator, which is belted to the motor which drives the fan blower supplying the wind for the organ. The couplers are also eliminated from the drawing, as their introduction would tend to bewilder the non-technical reader; they are, however, merely multiple-contact switches, or gang-switches for the diverting of the current from one normal path, into two, three or more paths—all originat-

ing from a single starting point (one-key contact), and their position is in the circuit between the key contact and the magnet.

Probably the greatest single convenience which has been invented for the comfort of the organist is the Adjustable Combination Action; with it he is able to command any desired arrangement of stops at any instant. All modern organs are provided with *Pistons* located immediately below the manual, the stops of which they control; *Pedal Studs*, having the same function and operated by the feet, are also being fitted somewhat frequently of late.

There are two systems of stop combination control in use, known as the *Blind* (non-movable) and the *Visible* (movable) systems; in the former, which is employed on only a very small percentage of the modern organs, the stops do not move in and out in accordance with the setting on the pistons; the stops proper can be moved only by the hand of the performer and the combination action is in reality a kind of an appendage to the organ instead of a complete, absolute system of control. It is not being used in the work of any of the notable builders, and may be regarded as obsolete. The *Blind* system is generally found constructed with a small plug-board—like a telephone control-board, or with a small switch-board; in either case there is a plug-hole or switch for every stop for each piston on each manual, or pedal organ, *viz*: if there are ten stops on a manual and five pistons controlling them, there will be fifty plug-holes or switches; by plugging-in or turning the switches the stops which will be added by the pistons are selected.

The *Visible*, or movable system, while more expensive to construct than the one just described, presents so many points of superiority that it is being used by all the best builders of the country. In this system the *stop-knobs* move in and out in accordance with the setting on the piston, thus furnishing an absolute indication of the

status of the organ at any instant. The method of setting-up varies—there being three methods of control commonly found: *first*, the setting being fixed by drawing a stop-knob numbered to correspond with the number of the particular piston; *second*, by pressing a general *setter-piston* and then pressing the piston desired while holding in the setter; *third*, a system in which the piston is held in while the stops are smartly rapped into position—on or off—by the fingers of the performer, there being a friction slide fitted to stops in this case which permits this motion but still does not allow them

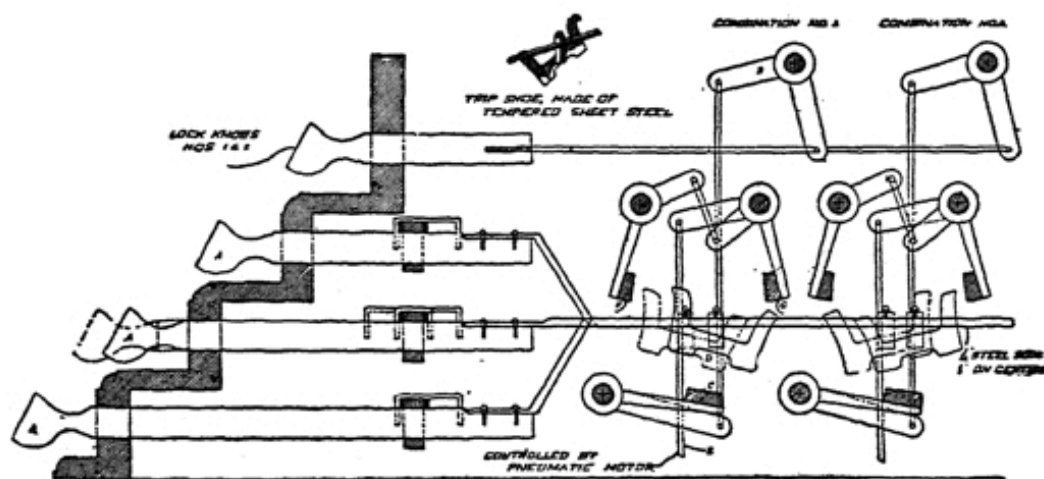


FIG. 24. ADJUSTABLE COMBINATION STOP-ACTION

to slip when using the piston in the usual manner. The process is the same in each case but the last; the stops are prepared and then the setting is done; with the last the setting is done during the preparing process, so to speak, the two being really simultaneous. Fig. 24 illustrates the mechanism employed in this type of combination action, two pistons only being indicated.

In the drawing the stop-knobs to be controlled are indicated at A, A, A. To set the combinations first arrange desired stops for piston No. 1, then draw the Lock-Knob No. 1; this knob is connected by rods and a bell-crank to the bar C, which throws the *trip-shoes*, D,

into *on* or *off* position. The one movement tilts *down* the trippers on the *on* stops, and tilts *up* those on the *off* position; these trip-shoes are constructed to move with a certain amount of stiffness.

This preparation being made and the lock-knob pushed in again, the act of pressing the piston No. 1, will cause a pneumatic motor to be inflated which will raise the rod *E*; this rod connects with the two fans, *F*, and *G*; these two fans move toward each other, the one pushing out all stops set to be out, the other pushing in all stops not so set.

This same mechanism is duplicated for each piston provided for the particular section of the organ, and the action in the case of every one of them is the same. As there is no interference between this action and the playing part of the organ, it is perfectly possible to change the setting of combinations at any time, even during the actual performance of a composition.

One of the biggest factors in developing the organ into a highly *expressive* musical instrument has been the development of perfect *Swell-Boxes*, and the inclusion of from one to six of them in the instrument; from two to three are commonly found of late. By this means an unparalleled flexibility is secured, and the organ is no longer limited to music of a strictly contrapuntal nature.

In Figures 25 and 26, we illustrate the working principle of the Swell-Box, looking at the box from the top.

Swell-Boxes very often are veritable *rooms*, as now constructed, with wide passageways to all parts of the box; in this respect they are a far cry from the small, cramped boxes of early days—in some of which only a small boy could enter! They are all alike in one respect, however; the front consists of a series of shutters swinging on pivots (similar to the familiar Venetian blind) and controlled by the action of the expression lever, or swell pedal. In the modern organ electricity is again

relieving the player of much of the labor of playing by interposing a "swell engine" between the swell pedal, and the shutters; when this is done the most delightful

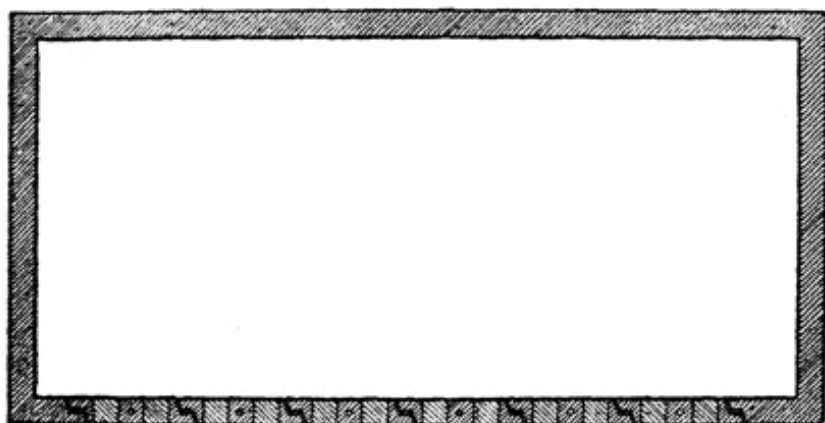


FIG. 25. CLOSED SWELL-BOX

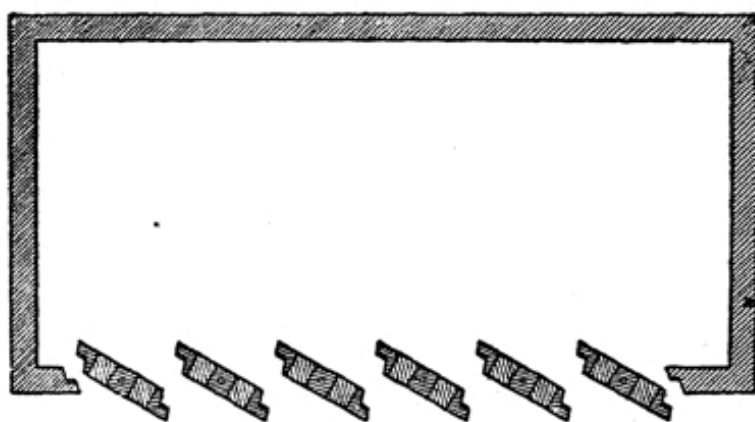


FIG. 26. PARTLY OPEN SWELL-BOX

effects (slow or quick swells, accents, sforzandos) are possible.

A few words also on the subject of organ pipes may be of value to the student. All commonly found organ pipes are developments of the primitive flute instruments, or of those with a reed—of which the modern clarinet is an example. The materials commonly employed are wood, tin and lead mixtures, and zinc; a few

others, as for instance sheet steel, are occasionally met with. The scale—*i. e.*, the relative diameter to the length—varies tremendously; an 8 ft. *Open Diapason* pipe may be as much as 6 inches in diameter at the lowest note, while a *Viol D'Orchestre* pipe of the same note might be only about  $1\frac{5}{8}$  inches in diameter. The wind pressures employed also vary wonderfully; four to ten inches pressure is generally found nowadays, but for solo organ purposes the pressures run up to fifteen, twenty, thirty, and in rare cases as high as fifty inches. Great refinement of tone as well as terrific power may be secured at will from these increased pressures; the skill of the voicer is the determining factor as to which it shall be. In Fig. 27, we illustrate a type of flute formerly much used as the heavy 8 ft. flute for the Great organ, viz: the *Doppel Flute*; this type of stop is interesting in that it possesses *two* mouths to the pipe instead of the usual single mouth.



FIG. 27.  
SECTION  
OF DOPPEL  
FLOETE

Of great value to the development of variety in organ tone has been the introduction of the small scale *Viols* which act as the organ counterparts of the stringed

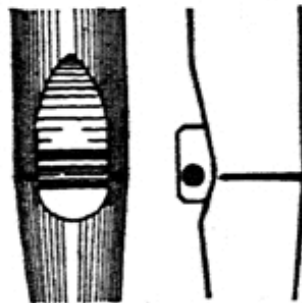


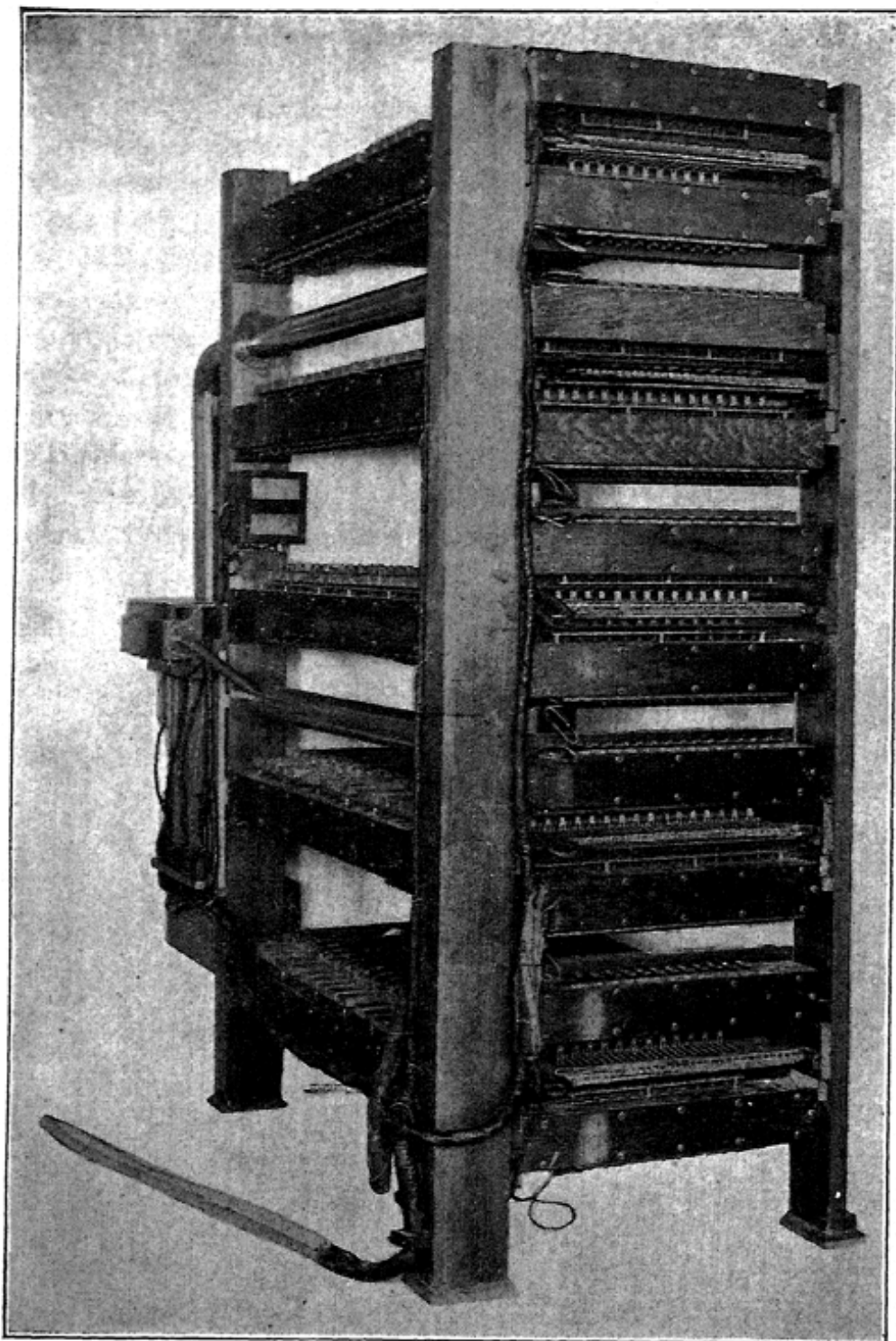
FIG. 28. SECTION OF SMALL SCALE VIOL

instruments of the orchestra. They are slender pipes, made of fine tin, and their voicing is a test of the skillfulness and patience of any voicer.



The improvement in reed voicing has been largely one of perfection of design, more accurate manufacture of reed pipes, and the wonderful advantage given by higher wind pressures than were possible before the days of modern actions; practically all of the orchestral instruments are imitated with incredible faithfulness by some of our best builders, the *French Horn*, *English Horn* and *Clarinet* stops being especially successful. So much has been accomplished that it seems possible that future developments may have to be along the lines of varied applications of percussion effects; certain it is that the instrument now more than merits the words of Honore de Balzac when he says: "The organ is in truth the grandest, the most daring, the most magnificent of all instruments invented by human genius."





**REMOTE CONTROL COMBINATION ACTION**  
(Courtesy of Welte-Tripp Organ Corporation)