principals and flutes. The bolder, more penetrating sound of the principals is sometimes spoken of as "male," the broader, softer, and more rounded sound of the gedeckts "female." Within a division, there are usually single examples of each of these types at various pitches, all voiced and balanced to blend with their brothers or sisters in the same family, or division. The system provides for a maximum range of color by the use of one stop at each pitch, however many pitches are to be employed. Neither of the two foundation stops are permitted excessive predominance, so that the equality and perfect blending of representatives of other elements of the harmonic series ensure a distinct change of well-integrated color with each single stop change. One or two knobs can be easily moved by hand.

The scales and voicing treatment of all the stops in a division are planned and executed in relation to each other, so as to produce the maximum range of color and dynamics within the division, and the maximum of contrast with the other divisions. The abnormality of a fortissimo consisting altogether of foundation tone is impossible. Each stop change noticeably alters the harmonic structure, each division builds up from a quiet foundation to a brilliant full sound.

Let us examine several stoplists with especial reference to these underlying concepts of registration. First, the famous instrument in the Laurenskerk at Alkmaar that has been praised so highly in these pages, and which stands as a tremendous monument to the organbuilding art of the Netherlands from the seventeenth century down to the present day. Between 1639 and 1645 Galtus-Germer, Jacobus Galtus van Hagerbeer, and Levinus Fekmans built the first organ. In 1685 the Duyschots, Senior and Junior, worked on it. In 1723-25 Franz Caspar Schnitger restored, renewed, and enlarged it, and made of it a true representative of the organbuilding principles and practices of his father, Arp. In 1782, 1823, and 1854, it underwent repairs and alterations by Johann Strumphler, A. van Gruisen, and C. F. A. Naber, respectively. Between 1940 and 1949 it was restored to its pristine glory as a Schnitger by the great contemporary artist builder, D. A. Flentrop. Scales (diameter) of the C pipes are given in millimeters.

Hoofdwerk	C	c	c^1	c^2	c^3
16′ Prestant	242	137	74	48	31
8′ Prestant	140	84	48	30	17
6′ Quinta	90	53	31	18	10
4′ Octaaf	80	49	30	17	10
3′ Quint	60	34	20	11	6
2′ Octaaf	53	30	17	10	5
2′ Flachfluit C-B stopped	48	40	27	16½	11
II Ruispijp 2′	50	30	18	10	5½
1 1/3′	35	22	12	7½	4½
VI Mixtuur 1 1/3′	32	19	11	6½	4
II Tertiaan 4/5′	21	21	12	7	5
2/3′	17	17	11	6	4
16′ Trompet	165				50
8′ Fiool di Gamba (reed)	50				40
4′ Trompet	95				40

Rugwerk					
8′ Prestant	140	80	46	26	17
8′ Holpijp	120	74	40	24	16
8′ Quintadeen	95	60	36	24	14
4′ Octaaf	80	42	23	14	8
4′ Roerfluit	79	48	31	22	16
3′ Spitsfluit	76	45	27	18	11
2′ Octaaf	42	24	13	8	5
2′ Woudfluit C-f♯ stopped	48	38	30	19	11
1 1/3′ Quintanus	36	22	13	7	4
III Cymbel, 1/5′	7	7	7	7	7
VI Mixtuur, 2/3′	17	10	6½	6½	6½
II Sesquialter, 1 1/3′	19	19	10	7	4½
4/5′	32	32	18	9	6
8′ Trompet	130				49
8′ Fagot	46				23
8′ Vox Humana	42				20
Bovenwerk					
8′ Prestant	145	82	47	31	19
8′ Baarpijp	160	97	69	24	22
8′ Roerfluit	110	72	41	26	18
8′ Quintadeen	105	60	34	22	15
4′ Octaaf	85	53	31	18	10
4′ Fluit	72	51	30	18	13½
3′ Spitsfluit	78	44	27	17	11
2′ Octaaf	53	30	17	10	5
2′ Gemshoorn	62	36	23	14	10
III Cymbel, 1/5′	7	7	7	7	7
IV Scherp, ½′	14	8½	5	5	5
II Sesquialter, 1 1/3′	32	32	18	9	6
4/5′	19	19	10	7	4½
8′ Trompet	130				42
8′ Hobo	80				30
8′ Vox Humana	50				25
Pedaal	C	c^1			
16′ Prestant	270	145			
8′ Octaaf	145	52			
10 2/3′ Roerfluit	155	58			
5 1/3′ Quint	100	35			
4′ Octaaf	82	32			
2′ Nachthoorn	40	17			
VI Mixtuur, 1 1/3′	28				
III Ruispijp, 2 2/3′	52				
16′ Bazuin	180	100			
8′ Trompet	132	72			
4′ Trompet	105	55			
2′ Trompet	52	35			

Alkmaar