Techniques For Forming a Winter Garden

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ABSTRACT

The winter garden is an evergreen corner of nature in the house. The inner composition of the winter garden is connected with the outer space of nature. Comfort and beauty are emphasized by plants combined together with interior items into a beautiful green oasis. The article discusses the types of winter gardens, design features and selection of plants.

Keywords: glass structures, residential winter garden, greenhouse, microclimate, season, plants, flowers.

Introduction

A winter garden is an evergreen corner of nature in a house (Pic.1). A formal feature of winter gardens is the presence of a maximum glazing area of the enclosing structure from all sides facing nature. The orientation of the winter garden relative to the building, its dimensions (area and height), the planned temperature regime, functional purpose are the basis for creating the most favorable and comfortable operating conditions of the winter garden [1].

Fig. 1. Examples of winter gardens

Main Part

Consider the types of winter gardens:

Buffer-type winter garden (glazed gallery-veranda attached to the house). Non-residential or seasonally residential unheated, poorly landscaped premises. This type of winter garden has only an aesthetic orientation, allows you to admire the landscape

at any time of the year. It is located at the entrance to the house and is a buffer between the open space and the house itself. The construction with a glass case plays the role of a solar «trap», in which heat accumulates, contributing to the heating of the house. The buffer-type winter garden does not maintain a constant microclimate, because environmental access is periodically present. In the case of an unheated winter garden, it plays the role of a thermal buffer zone between the street and the main building. This reduces the heat consumption for heating, but excludes the possibility of year-round use of the winter garden as a living space. Like all winter gardens, buffer structures were originally designed for the cultivation of plants and flowers. Winter gardens-verandas are universal, have a lot of advantages and can compete with the exterior and interior design of the house. The dimensions (height, length, width) and geometric shape depend on the size of the house. A buffer-type winter garden is a great opportunity to observe the surrounding nature without going outside, enjoy natural light indoors, add volume to the space [2-7].

Residential winter garden (recreation room, office, etc.). This is a heated, landscaped space. A successful climatic combination to create comfort, both for the residents of the house and for plants. But the main purpose is additional living space (for example, a recreation room for guests and residents of the house). Glass walls make it possible to combine a winter garden with the surrounding nature. A residential winter garden, as a rule, occupies a large area.

The winter garden - recreation room can be located in any part of the house and, in the case of a heated option, can be used all year round. Most often, this area becomes a continuation of the living room or dining room, it is used both as a living room, and as a dining room, and as a study, etc.

Plants are planted in decorative planters and pots as in the usual indoor gardening. The advantage is enjoyed by mobile compositions that allow plants to be placed in accordance with their love of light, the convenience of caring for them and the interior features of the glass recreation room [6-9]. From a compositional point of view, along with mobile stands that allow changing the appearance and design of the winter garden space, numerous types of shelves, bookcases, shelving and other decorative elements made of metal or wood can be used. If a special microclimate is not maintained in the room (high temperature or humidity), then there are no restrictions in the selection of furniture and appliances. The original method of decorating a «sunny» room is a florarium. It is easy to maintain a certain microclimate and illumination in it.

Winter garden - greenhouse (winter garden with a specially created microclimate for plant breeding). Practically uninhabited, heated, heavily landscaped winter garden. The main purpose is the cultivation of plants that cannot withstand the outdoor climate of the area. The use of this room as a place of rest fades into the background. This type of winter garden is often chosen by collectors of exotic plants. Various reservoirs (fountain, waterfall, pond) will look good in the greenhouse - they will enhance the effect of interaction with nature. In large rooms, paths are usually provided that divide the complex into separate zones, allow you to get closer and admire the original shape of the leaves or fancy flowers. Winter garden - greenhouse is perhaps the most perfect form of indoor gardening. It is placed in a special climate-controlled room, where everything necessary for plant life (first of all) and human recreation is provided in advance. Combining the features of building materials, small forms of architecture and vegetation, you can create a variety of green interiors with recreation areas. Each fragment of the garden with skillfully selected vegetation is a separate composition, but all together they make up a single whole. In the design of the winter garden, swimming pools, wooden terraces, decorative furniture, screens with vertical grids for climbing plants, canopies and trellises are used. The winter garden - greenhouse makes it possible to grow plants from all over the world, but it is necessary to choose plants of the same climatic zone with similar environmental requirements. It is desirable that they look good in a single composition. All this contributes to the creation

of a comfortable environment for recreation and demonstration of the richness of the flora.

When choosing the design of a winter garden, you need to consider not only its future appearance, but also functional features. An integral part of the winter gardens project is the implementation of a static calculation - taking into account wind, snow loads, as well as the own weight of the winter garden structure. Based on the analysis of the data obtained, the design features of the winter garden are determined to ensure maximum stability, to exclude exceeding the permissible deformation. The main characteristics of any winter garden are the safety of the structure, the protection of the interior space from cooling or overheating, the rigidity and strength of the frame, optimal light transmission and high resistance to extreme weather conditions.

The seemingly weightless, transparent structure serves as an organic extension of the room, significantly expanding its boundaries and influencing the internal climate. The microclimate of the winter garden differs from the climatic regime of a normal room. Thanks to new materials, as well as modern engineering and technical capabilities in the field of ventilation, heating and shading, the winter garden can be turned into an ideal place to relax. The winter garden is a rather complex organism [2]. It must meet such characteristics as the safety of the structure, the protection of the interior from cooling and overheating, high resistance to atmospheric influences. For example, temperature, humidity, air circulation and light flux [3] provide optimal conditions for the growth and development of vegetation in the winter garden. Especially if there is a small pond in the room. At the same time, increased humidity inevitably occurs and an adjustable ventilation system is required. In addition, it is mandatory to have an air conditioner and a heating system. The regulation of the luminous flux through transparent walls is ensured by the presence of blinds. Plant compositions should be arranged in such a way as to ensure a free approach to the blinds around the perimeter of the walls. If it is planned to install structures for vertical landscaping (for example, phytosten [4]), then access to the blinds should also be preserved. In the design of the winter garden, in addition to plants, small architectural forms, reservoirs, aquariums, alpine slides, floral compositions, elegant garden furniture, decorative lighting are used. As in outdoor gardens, the layout is used here. Plants that are very sensitive to direct sunlight should be located in the shade of more light-loving ones. The selection of plants for the winter garden will depend entirely on what temperature (its lower value) will be in the room in winter. Tropical plants of America, Asia and Africa assume that the temperature will not be lower than 18-24 ° C. If these plants are not from the tropical zone of Asia and Africa, then they need a constant temperature in the range of 13-18 ° C. The same applies to the evergreen subtropical plants of Japan, China, New Zealand. The same temperature will be optimal for desert plants in Africa and America. Elevated temperatures, especially in winter with a lack of light, are harmful to tropical plants. For the harmonious existence of plants, they need to provide full-fledged care [5].

Watering and moisturizing is of exceptional importance. Without enough water to dissolve the necessary nutrients in the soil, plants not only wither, but also starve. Water is necessary for all physiological processes: photosynthesis, the movement of organic compounds formed as a result of photosynthesis, as well as for the absorption of minerals in the form of soil solutions. Water also regulates the temperature of plants by evaporation. At the same time, they suffocate and get sick from an overabundance of moisture. Sour earth causes root rot. To prevent this from happening, it is necessary to have a good idea of the peculiarities of each particular culture.

Fertilizers are divided into organic and inorganic, highly and low concentrated. All top dressing is done some time after the usual watering. Applying fertilizers to dry soil can lead to chemical burns of the roots. The root system of plants normally works at 1-6% salt concentration in the soil solution. When applying large doses of fertilizers, especially in very poor soil, the plant can get osmotic shock,

leading to its death, so you need to follow the instructions clearly.

The characteristic functions of bioregulators and stimulants are stimulation of growth or root formation, regulation of vital processes in plant cells, adaptation to adverse environmental conditions and protection from diseases. The self-sufficiency of a residential winter garden and its direct connection with other residential premises is nowadays a defining functional feature.

Consider some types of unpretentious plants for winter gardens [6]:

Aloe vera - grows well at home and in a winter garden. The two main requirements of this culture are shelter from direct sunlight and good drainage. The stagnation of water at the roots of aloe can rot (Fig. 2).

Fig. 2. Aloe vera

Fig. 3. Bougainvillea

Bougainvillea is perfect for growing in a greenhouse, in summer bougainvillea is kept at a temperature of 20-25 °C, in winter - at 12-16 °C (Fig. 3).

Ferns are unpretentious plants that can be grown both indoors and outdoors. A greenhouse with a humid microclimate and a comfortable temperature is suitable for them (Fig. 4). In the winter garden, it is best to grow the following types of ferns: adiantum (curly fern), asplenium (kostenets), blehnum (derbyanka), nephrolepis.

Rhododendron is a luxurious shrub that is best grown in greenhouses. For the winter garden, you can choose more thermophilic and low-growing types of rhododendrons: Indian rhododendron, Japanese rhododendron, soft rhododendron, dense rhododendron, etc. The best temperature for growing rhododendrons is 10-15 °C (Fig.5).

Fig. 4. Ferns

Fig. 5. Rhododendron

Rose - miniature roses of the patio group or floribunda with a height of up to 50-80 cm are ideal for a winter garden (Fig. 6).

Fuchsia is an ornamental plant grown in a winter garden. In greenhouse conditions, fuchsia usually does not exceed 1 m in height. The most comfortable temperature regime for this crop is 10-12 ℃ (Fig. 7).

Fig. 6. Rose

Fig.7. Fuchsia

Eucalyptus is a plant grown in a greenhouse. High summer temperatures and bright sun only benefit eucalyptus, and in autumn and winter it requires a gradual decrease in temperature to 16-17 ℃. Eucalyptus needs high humidity, so the container with the plant can be placed on a pallet with wet peat (Fig. 8).

Aspidistra is a plant with beautiful large leaves, unpretentious. With high humidity and good lighting, aspidistra will grow luxuriantly. There are various types of this plant: aspidistra tall, aspidistra large-flowered, aspidistra Sichuan, aspidistra Attenuata, etc. All of them are suitable for growing in winter gardens (Fig. 9).

Guzmania is a plant with large spike-shaped inflorescences of bright yellow-orange or scarlet color. Such a tropical plant requires high humidity and a sufficient amount of scattered light (at least 10 hours a day) (Fig. 10).

Fig. 8. Eucalyptus

Fig.9. Aspidistra

Fig.10. Guzmania

Canna is the decoration of any winter garden. In a greenhouse with low ceilings, it is best to grow Crozi Cannes (French Cannes). They are quite miniature – 0.6-1.6 m. They can be distinguished not only by their small "growth", but also by the characteristic whitish bloom on the leaves (Fig. 11).

The date plant is suitable for a winter garden with high ceilings. Such a plant needs a lot of space. In winter gardens, canary dates, palm dates, Robelin dates are usually grown (Fig. 12).

Fig. 11. Canaris

12. Date

Fig. 13. Citrus Fruits

Citrus fruits – in winter gardens, you can grow any kind of citrus trees: lemons, calamandines, kumquats, oranges, clementines. All of them will bloom and bear fruit in the greenhouse, provided good humidity and protection from drafts (Fig. 13).

Conclusion

Thus, the advantage of winter gardens are the following conclusions:

- enjoying the views of flowering plants in winter;
- cultivation of rare plants that in our climate are not able to winter in the open air;
- creation of a collection of rare flora representatives;
- creating a wonderful place to relax;
- the ability to decorate the house.

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