Givental’, A. B.
Groups of reflections in the theory of singularities. (Russian) [Zbl 0753.57020]

[For the entire collection see Zbl 0714.00017.]
This interesting paper deals with the study of the series of singularities $A$, $D$, $E$ [see for instance V.
Arnol’d, A. N. Varchenko and S. M. Gusejn-Zade, Singularities of differentiable mappings. Classification
of critical points, caustics and wave fronts (Russian) (1982; Zbl 0513.58001)] and it contains five sections.
In sections 1-3 the connections between quaternionic finite groups, singularities of surfaces, simple Lie
algebras, Dynkin diagrams and symmetry groups are presented. As application of these constructions one
obtains the description of the above-mentioned singularities and of their discriminants as orbits of the
symmetry groups of proper regular polyhedra. Sections 4-5 extend some of these results to nonsimple
singularities of surfaces. A substantial result for unimodular quasihomogeneous singularities is given.

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MSC:
57R45 Singularities of differentiable mappings in differential topology
58C25 Differentiable maps on manifolds
58K99 Theory of singularities and catastrophe theory
22E46 Semisimple Lie groups and their representations

Keywords:
singularities; quaternionic finite groups; singularities of surfaces; simple Lie algebras; Dynkin diagrams;
symmetry groups; discriminants; orbits of the symmetry groups of proper regular polyhedra; nonsimple
singularities of surfaces; unimodular quasihomogeneous singularities