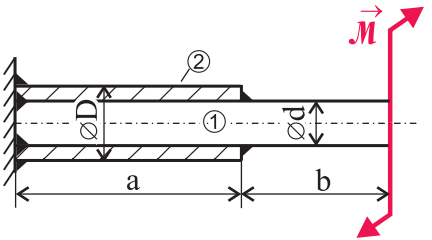
Problem 503

Check the system of bodies in the figure from the viewpoint of the possible limit states. The maximum admissible twisting angle in the point of action of the couple equals α. Shear yield stress value is $\tau_K = \sigma_K/2$.



Input values:

$a = 600\,\mathrm{mm}$,	$\varnothing D = 50\,\mathrm{mm}$,	$E^{(1)} = E^{(2)} = 2 \cdot 10^5\,\mathrm{MPa}$,
$b = 400\,\mathrm{mm}$,	$\varnothing d = 30\,\mathrm{mm}$,	$\mu^{(1)} = \mu^{(2)} = 0,3$
$\mathcal{M} = 1000\,\mathrm{Nm}$,	$\sigma_K^{(1)} = 400\,\mathrm{MPa}$,	$\sigma_K^{(2)} = 450\,\mathrm{MPa}$, $\alpha = 5^o$.

torsion