Summary

Cold Working(CW):

1. Room temperature deformation.
2. Rolling on Metal piece in a given direction which may be transverse or Normal direction results in increment of strength, ductility.
3. Yield Strength of the material increases as density of dislocations increases.

Effect of Heating (Annealing) after Cold Working:

1. Annealing of the cold worked structure at high temperature softens the metal and reverts to a strain-free condition.
2. Annealing restores the ductility to a metal that has been severely strain hardened.
3. Annealing consists of three features(processes):
    i) Recovery
    ii) Recrystallization
    iii) Grain growth

Recovery:

The restoration of the physical properties of the CW metal without any observable change in microstructure. Strength is not affected.

Recrystallization:

The cold worked structure is replaced by a new set of strain free grains due to migration of high angle boundaries. Hardness and strength decrease but ductility increase.

Grain growth:

Occurs at higher temperature where some of the recrystallized fine grains start to grow rapidly.

Github Link: https://github.com/sumi-31/Microstructural-Images.git