Hear, see, watch, notice and similar verbs of perception can be followed by object + infinitive without to or object + -ing form.

There is usually a difference of meaning between the two structures.

The infinitive is used after these verbs when we want to say that we hear or see the whole of an action or event. The -ing form is used to suggest that we hear an action or event in progress.

Compare:

I heard her sing a lovely song. (As I sat listening, she started singing a song and I listened to her until she finished it.)

I heard her singing a song as I walked past her room. (When I heard her she was singing a song – she was probably in the middle of her singing. Anyway, I didn’t hear the entire song.)

The -ing form can suggest repetition.

I saw him throwing stones at the dogs. (= He kept throwing stones.)

After these verbs possessive forms cannot be used with an -ing form.

I saw Peter getting out of the train. (NOT I saw Peter’s getting out of the train.)

Object + past participle

The verbs see, hear, watch, notice etc., can also be followed by an object + past participle.

In this structure, the past participle has a passive meaning.

I heard my name repeated several times. (= My name was repeated several times.)
Verbs of perception

Look at

Look at can be followed by object + -ing form. In American English, object + infinitive is also possible.

Look at him dancing!

Look at him dance! (US)