Timing a Walk

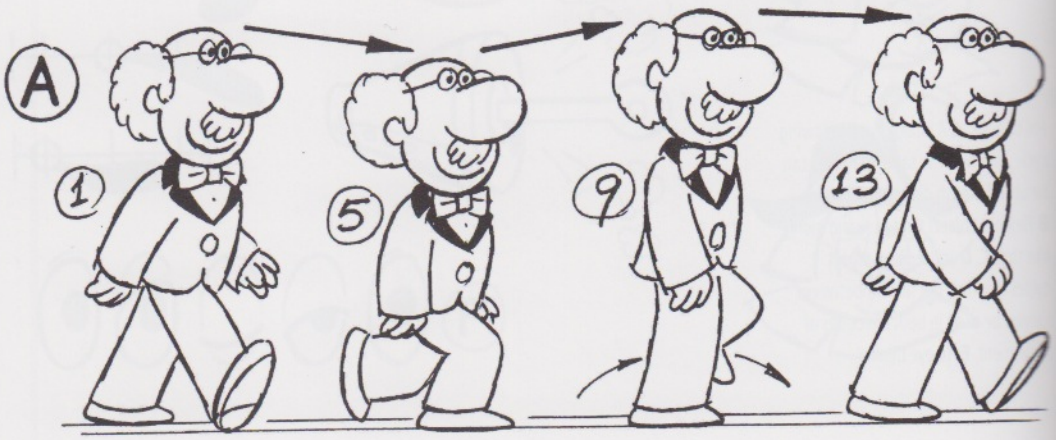
What are the main features of a 'normal' human walk? There can be as many walks as there are people. Does the character walk leaning forward or laid-back? With slumped shoulders or a posture that is ramrod erect? Does the character walk on tiptoes or on the balls of their feet or heels? Nose in the air or head down, deep in thought? What are the arms doing?

The walk is the first step to finding the key to a character's personality.

To begin, walking has been described by the old animators as 'controlled falling', i.e. skilled manipulation of balance and weight. Most animators begin by animating their own walk, since it's motion is already within their minds.

The only point in a walk when the figure is in balance is at the instant when the heel of the front foot touches the ground; the body weight here is evenly spaced between the two feet. This is usually the main key drawing (Fig. A). It gives the stride length, and so can be used for planning the number of steps needed for the character to cover a certain distance. This 'step' position is the one with the maximum forward and backward swing of the arms. It is actually the middle of the fall forward onto the front foot, when the front knee bends to cushion the downward movement of the weight. The key position here is usually known as the 'squash' position (Fig. A5). The body's center of gravity is at its lowest point, and the front leg supports the body weight. The back foot is almost vertical and although the toe is just touching the ground, it bears no weight at all in this position. In Fig. A9 the bent leg straightens, lifting the center of gravity to its highest point as the back foot moves forward. This is the 'up' position and leads into the next 'step' at 13.

There are two slightly different ways of animating a walk—the choice is one of convenience. Suppose a character makes a 1.8 inch stride in 12 frames. Assuming that the walk is a repeat movement, then if we call the left 'step' drawing 1, this drawing will appear again 24 frames later (i.e. drawing 25 = drawing 1) 3.6 inches left or right of the original position (Fig. B).



So the intermediate positions of the walk can be animated between these two positions. The character can then advance along the cels, relative to the pegs, until it arrives back at drawing 1 at which point the pegs are moved 3.6 inches and carry on for the next two steps.

The alternative method (Fig. C) is to animate from drawing 1 back to drawing 1 in the same position, so that all the bodies in the cycle are superimposed over one another, with an up-and-down movement only, instead of advancing along the cels. The 3.6 inches, which the figure moves along every two paces, is now taken up by moving the foot backward 0.15 inch per frame. After 24 frames the feet have effectively slid back the 3.6 inches to make up the two steps. This is called 'animating on the spot' because to make a man walk by this method, the pegs carrying the figure remain static while the background pans backward by the same amount as the feet per frame.

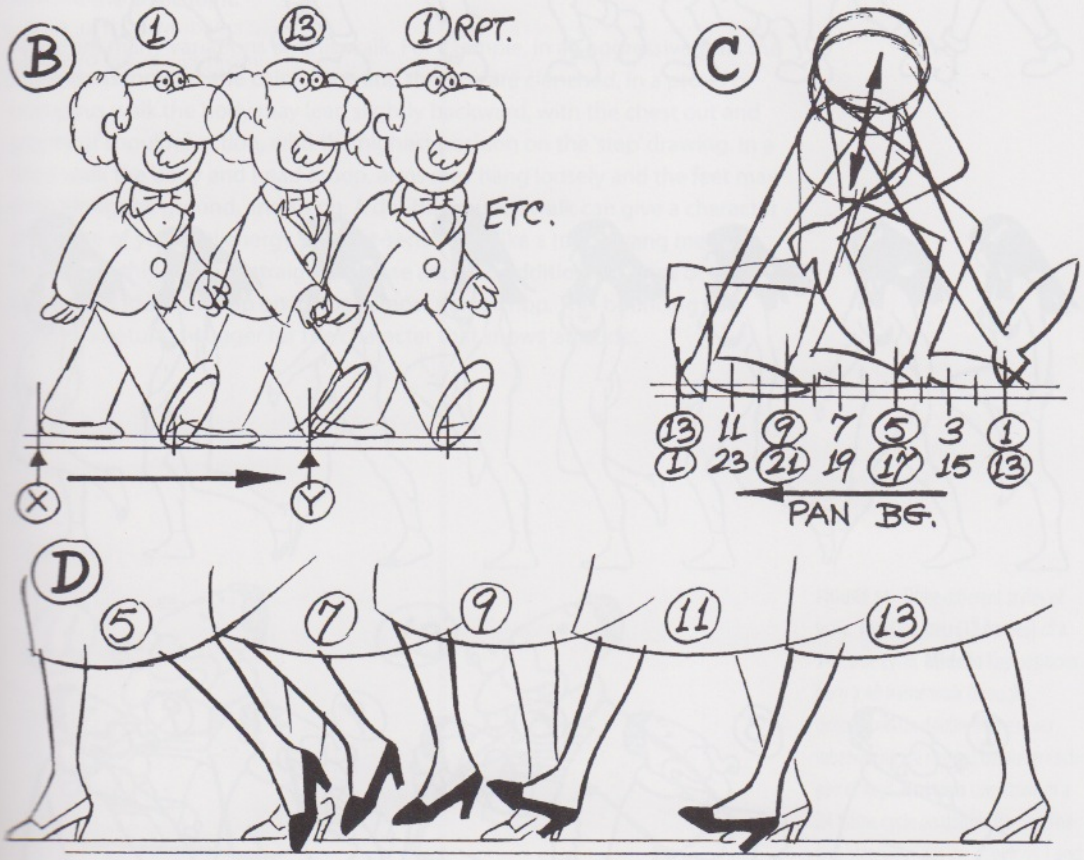
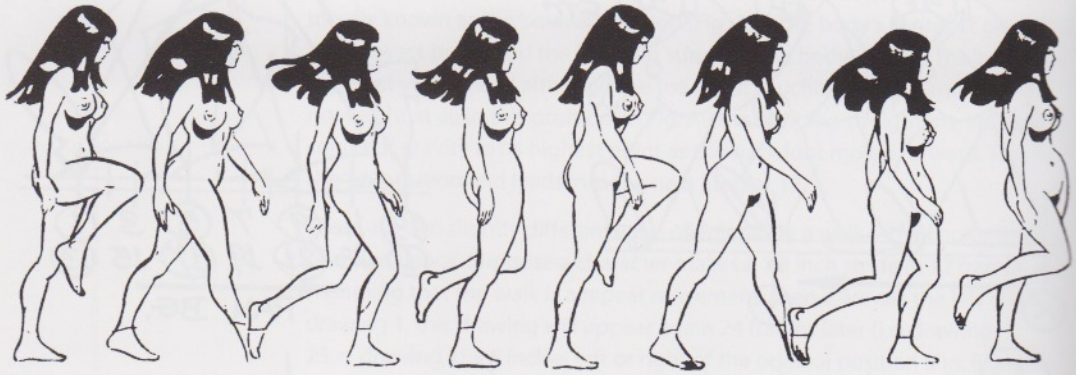


FIGURE 50 **A** Part of a walk cycle, spread out for clarity. The complete cycle would be 1–23 (i.e. 1 = 25), 17 being the same as 5 with legs reversed, and 21 the same as 9. **B** The same cycle animated forward with static pegs. The pegs stay in position X whilst the figure moves forward on 1–23. The pegs then move to the right by the length of two strides and 1–23 is repeated in the new position Y. **C** A walk cycle 'on the spot'. The body moves up and down whilst the heels slide backward along the scales at the same speed as the background pan. **D** Successive positions in a naturalistic walk. The left shoe is shaded black. Note that on 11 the left leg is straight just before making contact with the ground on 13 (see next page).




1
3
5
7
9

Types of Walk

The up-and-down movement of the body should slow in and out of the key positions, but the forward movement of the body should be at a uniform speed, or the animation 'sticks'.

It is important that there is just enough time for the straight leg to register on the screen in the 'step' position. As the front leg is bent both before and after this position, there is a danger that the eye will connect these two positions—missing the straight leg—with the effect that the character is doing a 'bent-leg' walk. Fig. D on the previous page gives another variation of this problem. It is based on a naturalistic walk, and the left leg kicks out straight on drawing 11, although it is still moving forward to the 'step' position 13. The front foot should slap down flat on to the ground quickly after the 'step' drawing. This loosens the ankle joint.

There are many variations on this walk. For example, in an aggressive walk the body leans forward, the chin is out, and the fists are clenched. In a proud or pompous walk the body may lean slightly backward, with the chest out and plenty of shoulder action, with the highest position on the 'step' drawing. In a tired walk the body and head droop, arms may hang loosely and the feet may drag along the ground, and so on. A double bounce walk can give a character the sense of youthful energy, a 'street-sense' feel, like a tough gang member. To achieve this, on each straight up pose add two additional frames of the character's foot rising up on its toe, almost a small hop. This bouncing gait creates a natural swagger for the character that shows 'attitude'.

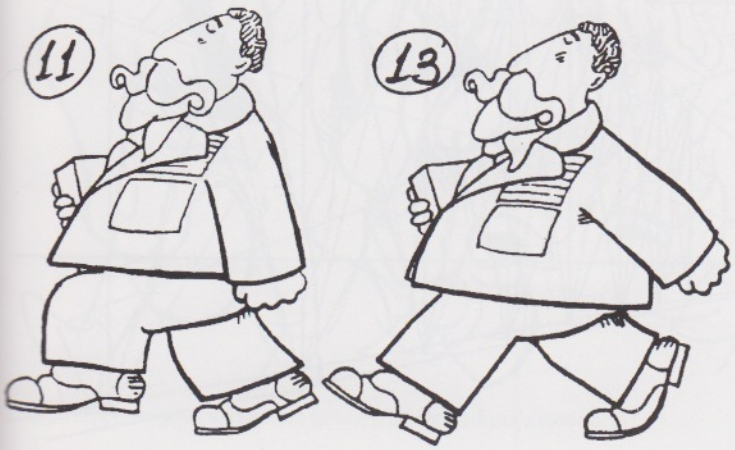


FIGURE 51 Three different styles of walk: **Top** One step (12 frames) of a 24 frame cycle. **Middle** Key positions from a 48 frame walk through deep snow. On double frames two inbetweens are needed between each pair of keys. **Bottom** One stride of a 24 frame cycle on double frames. The two 'step' positions are drawings 1 and 13. The weight of the body squashes onto the front foot on 5 and rises as the back foot comes forward on 9. Note how the front leg remains straight on 3 to avoid the 'bent leg' look.

Spacing of Drawings in Perspective Animation

To animate in true perspective requires complex draughtsmanship and some understanding of the geometrical treatment of the subject.

Especially when a character walks in perspective, an accurate perspective grid must be drawn giving the height of the character and the length of the strides, so that the animator has a clear idea of how the spacing of the strides gradually increases or decreases. It is quite a difficult animation problem to make all parts of a figure get larger or smaller and yet remain in the right proportions.

For dramatic effect when a character rushes toward or away from the camera, a low horizon is preferable. High horizons provide a more relaxed effect. In both instances the vanishing point must be established in relationship to the horizon, which represents the camera or the audience's eye level. The increasing or decreasing lengths of strides must be worked out by defining measuring points for every few drawings. Estimation is possible, but must be plotted out carefully.

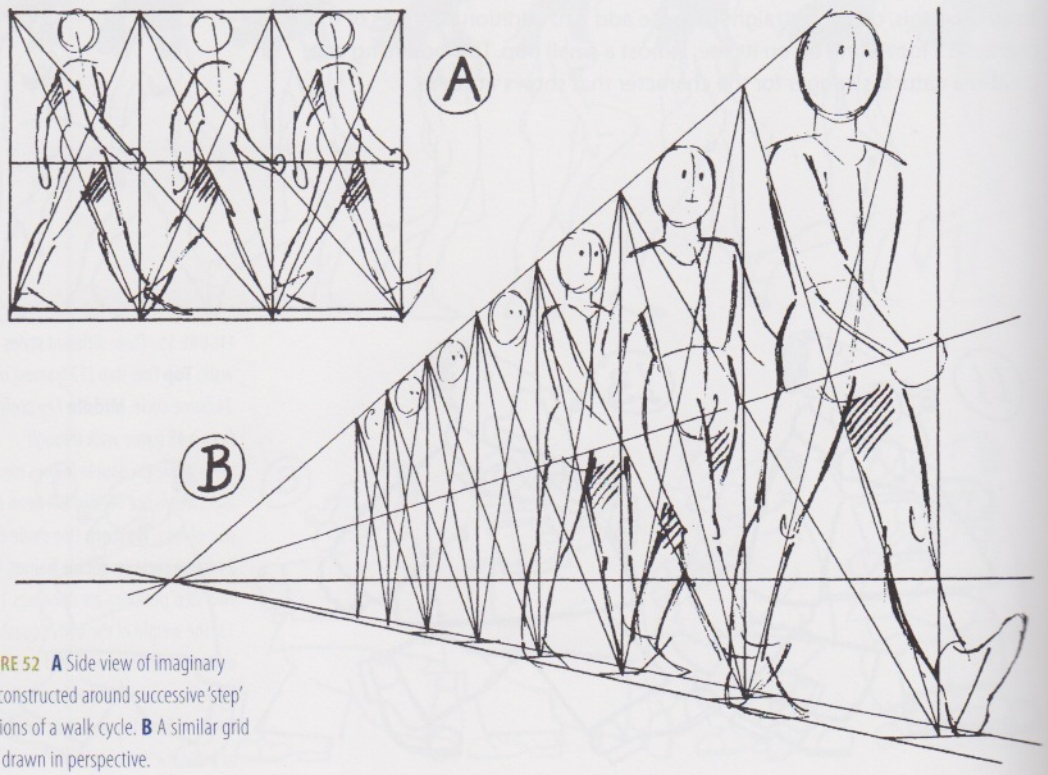


FIGURE 52 **A** Side view of imaginary grid constructed around successive 'step' positions of a walk cycle. **B** A similar grid to A, drawn in perspective.

Variation in perspective can be achieved by lowering the horizon and changing the vanishing point during animation. This, however, requires some experience. Weight must be evident in all perspective animation. In a perspective shot, a character can run from the foreground over the horizon in a few frames, approximately 12 to 16, provided the right degree of 'anticipation' is given. Because of the speed of the action, it is better to use single frame animation.

Effective animation requires movement in space and an illusion of three dimensions, otherwise the characters may appear to be too flat. Take advantage where possible of opportunities for movement in exaggerated perspective. For instance, if some part of a figure or object swings round close to the camera, emphasize the increase in size in the drawings.

C A rapid perspective gallop. There was one drawing in between each pair of positions.