

of the circle, yy , (Fig. 33). Besides this, the friction of the tooth against the finger is greater, commencing further from the line of centres, and in a direction more oblique, and the wear of both finger and tooth is increased. However, as far as safety is concerned, if the motive force is weak or the vibrations of the balance are quicker than usual, (18,000 per hour), the drop may safely be less than 10° , for the slower motion of the wheel as compared with that of the balance will prevent the tooth from overtaking the finger too soon. But, as the vigor

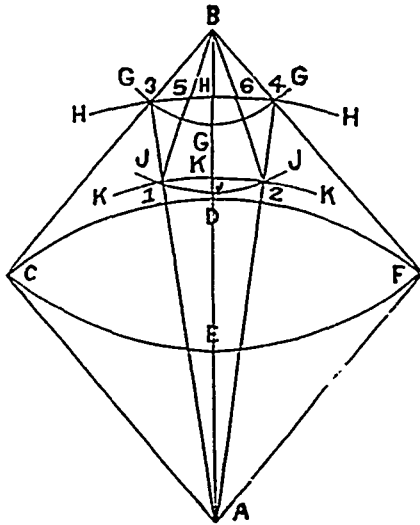


Fig. 32.

of the motive force increases, urging the tooth forward more quickly, the finger must have a greater start in advance of the tooth in order to attain a safe depth in the impulse circle jj , before the tooth reaches it. The maximum and standard drop may be considered as 10° , and the minimum 5° .

THE WHEEL AND PALLET ACTION.

507) Having fixed upon the sizes of the repose wheel and roller, the amount of small-lift, impulse drop, etc., we arrive at the wheel and pallet action, for which we have to determine the diameter of the impulse wheel, the length of the impulse pallet or finger, the large-lift, etc. All these points are governed by the proportion between the sizes of the repose and impulse wheels. As the finger must make a part of its vibration between two impulse teeth, in order to clear them, its length must be controlled by the diameter of the impulse wheel. Any change in the size of the wheel must be accompanied by an inversely proportionate change in the length of the finger, if the same centre distance is preserved. And the proportional sizes of both wheel and finger will depend upon the extent we decide to give to the large-lifting, or in other words, the arc through which the tooth is to propel the finger.

508) In planning the wheel and pallet action, as there must be an impulse tooth exactly midway between two adjacent repose teeth, (or pairs of teeth), the number of teeth in the impulse wheel is fixed by that in the repose wheel. But the diameter of the impulse wheel and the length of the finger are left to our discretion. The repairer must often select a new escape wheel out of a lot having different proportions, or even make a new one, adapted to the particular case. We will therefore consider the effects of varying the relative sizes of the parts of this action. By examining Fig. 32, we shall see

1st, that the greater the number of teeth in the same size of wheel, (and with the same centre distance), the shorter the finger must be, and *vice versa*. A , is the centre of the wheel, and B , of the balance staff. If we suppose 3 and 4 to be impulse teeth, the finger will reach from B to 4, and its point will revolve in the circle G, G, G . But if the wheel had three times as many teeth, say at 3, 5, 6, 4, then the finger could only reach to 5 or 6, since it must not touch them while vibrating. Consequently, the fewer the teeth in the impulse wheel, the greater the large lift will be. The following sections will be understood to refer to wheels having fifteen (single) teeth, which is the number generally adopted. Their application to the Chinese duplex will readily be seen, by making the requisite allowance for the different conditions.

SELECTED MATTER.

JIM SMITH, THE JEWELRY DRUMMER.

CHAPTER II.

THE DETAILS OF THE CHEROKEE WATCH CLUB—A DISAGREEABLE RIVAL ENCOUNTERED—THE DIFFERENCE IN EMPLOYERS—THE ENDLESS DETAIL AND HARD LABOR WHICH A DRUMMER FOR A JOBBING HOUSE FINDS.

WILLIAM COOPER IN *The Manufacturing Jeweler*.



TRUE to his word, Jim Smith sat up that night till the " wee small hours of morning," framing and concocting the new club rules and regulations.

"The Cherokee Ladies' Watch Club" was to have a membership of fifty, with weekly payments of one dollar each. Gentlemen were not eligible for admission, and only ladies' watches would be sold. Madame Hockstadersmith was to be president and treasurer, and the weekly drawings and general business was to be conducted every Thursday afternoon in her own best parlor. The watch was to be "an extra jeweled Columbian Watch Co's movement in a 14k. diamond jeweled case."

There was a proviso that should the member prefer a diamond ring instead, she could have her choice accordingly.

Armed with his night's labor, Jim paid his morning's fare well visit to both Mr. and Mrs. Green, deposited the papers with Mr. and Mrs. Hockstadersmith, and was just on the point of leaving when his great competitor, Harry Snide, entered the store.

"Hullo, Smith, what, just off?" adding in a sarcastic, sneering tone, "don't go yet. You know I won't interfere or hurt you. Now would I, Mr. Hockstadersmith?" as he turned to that worthy for his acquiescence.

"Well, I vas not know. Dis much I vill zay, dat Smidth