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PATENTS BY JOINT INVENTORS.

When two or more persons jointly invent a new improvement, the patent therefor may be properly issued in their joint names. But if one specific part is the invention of one of the inventors, and another specific part invented by the other party, the patent, if taken as a joint invention, is invalid. In such cases two separate patents should be taken, one by each inventor. This is well illustrated in a trial lately had in the United States Circuit Court, Southern District of Illinois, before Judge Gresham.

STEWART *et al.* v. TENK.

John Stewart and Will Campbell obtained letters patent No. 140,315 on June 24, 1873, for a joint invention for certain new and useful improvements in machines for paring, slicing, coring, and dividing apples and other fruit. The invention consists:

... First, in providing the said device with a paring knife so operated as to remove the skin of the fruit from all parts thereof outside of the parts operated upon by the coring knife; second, in conjunction with said paring knife, providing a convex anti-friction roller, to prevent any friction upon the device by the fruit when being operated upon; third, in providing the arm upon which said paring knife is mounted with the segment of a cogged guide or flattened sphere, so formed as to enable the said paring knife to operate upon a line describing one-half of the periphery of the vertical central plane of an ordinary shaped apple; fourth, in providing said segmental cog with a yielding ratchet, to assist the rotation of the cog and the preservation of an even pressure of the paring knife upon the fruit; fifth, in providing said device with a coring knife, which is so arranged that its cutting edge comes in contact with the parts of the fruit about the core with a draw cut; sixth, in providing said device with a double spiral fork for securely holding the fruit.

The twelve claims in the patent are for the machine as a combination and for separate and distinct portions of it as separate and distinct inventions. The bill charges infringement of only the tenth claim, which reads as follows:

"10. The combination of the arched coring knife, *i*, and slicing knife, *h*, substantially as shown and described."

It was insisted by the defendants' counsel that Stewart alone invented the arched coring and slicing knife, and that therefore a joint patent for this distinct invention was unauthorized. Stewart testified that he conceived the idea of combining the slicing and arched coring knife as it is described in the patent, and that he gave instructions to Campbell how to make the knife. He further testified that certain other parts of the combination which are covered by separate claims in the patent were invented by him, while other parts were invented by Campbell. Campbell also was examined as a witness; but his testimony on these points did not differ materially from Stewart's.

The judge held that Stewart and Campbell were entitled to a joint patent for what they jointly invented. It may be that their minds co-operated in combining the different parts which resulted in the production of the complete machine; but a joint patent can be sustained only for a joint invention, and the evidence shows that Campbell did not contribute to the invention covered by the tenth claim. Stewart was the sole inventor of the slicing and coring knife, and the patent for that, as a separate and distinct part of the machine, should have been issued to him alone. (Worden v. Fisher, 11 Fed. Rep., 505; Consolidated Bunting App. Co. v. Woerle, 29 Fed. Rep., 450.)

The bill was dismissed for want of equity.

TORPEDO BOATS IN A GALE.

The recent tests of torpedo boats at Kronstadt brought out some interesting facts, and will do not a little toward demonstrating that for the most effective work this class of craft must be divided into at least two general classes—sea-going and smooth water. The torpedo boats tested were all of them of the newest and most approved types, and, since these tests were competitive, we are enabled to form some idea of the relative skill in this description of naval architecture of the English, French, German, and Russian builders. There was the Sneaborg (French), 154 feet over all; the Vintara (German), 125 feet; the Kotling (Russian), 100 feet; and the Wiburg (English), 142 feet. The French boat was said to have a speed of twenty-two knots on the measured mile, but could not log more than twenty-one, even in a fairly smooth sea; the Englishman was said to be good for 25 in smooth water, the Russian 24, and the German about the same. On the third day, the sky lowered, the sea rose, and a good whole-sail blow which was prevailing developed into a gale, with a nasty sea running. This was a fortunate circumstance, for, as we know, the trials of torpedo boats so often take place in smooth water and under favorable circumstances that they have come to mean little or nothing. There was a trial in the English Channel, a while ago, in what might be called half a gale of wind, in which, of a fleet of 43 torpedo boats, not more than half a dozen could keep their noses up to it, and these pitched

and rolled and made such a serious matter of it that it was necessary to seek shelter. In the recent trial the Frenchman was the only one that could weather the gale and the seas. He toiled up the big seas after the foam crests atop and dashed down the other side with the same pertinacity as a ferret chasing a rabbit over foothills. The German had his hands full at the start keeping the water out of his engine room, and early in the day turned about and ran to make a harbor. The Englishman, too, had more weather than he could tackle, and the Russian alternately put his nose or stern under way up to the midship section, and his crew, giving up the test of speed, devoted themselves wholly to the important duty of trying to keep above water.

These boats that acted so badly were filled chock-a-block with machinery, while the Frenchman, while not able to keep up with them in smooth water, began to forge ahead as soon as the winds and seas increased. The splendid way in which this French torpedo boat—built, by the way, by M. Normand, at Havre—stood up and rode over the heavy seas would seem to show that sea-going torpedo boats are not so impracticable as was thought, and that, even on the agitated surface of the ocean, such boats, being let down from the deck of a war ship, can pick their way tenaciously through heavy seas toward an enemy who thinks himself secure from such craft amid the raging elements.

THE CELESTIAL WORLD.

TOTAL ECLIPSE OF THE MOON.

The moon will be totally eclipsed on January 28. The phenomenon will be generally visible throughout North and South America, Europe, Asia, and Africa. The conditions for observation will be specially favorable, as the spectator will neither be obliged to sit up late in the evening nor get up early in the morning for a view of the interesting exhibition.

The eclipse takes place in eastern standard time as follows:

	h. m.
Moon enters penumbra.....	3 27.5 P.M.
Moon enters shadow.....	4 30.2 P.M.
Total eclipse begins.....	5 30.7 P.M.
Middle of the eclipse.....	6 19.9 P.M.
Total eclipse ends.....	7 00 P.M.
Moon leaves the shadow.....	8 03 P.M.
Moon leaves penumbra.....	9 11.7 P.M.

It will be seen that the moon enters the earth's shadow before sunset, but when the total eclipse begins, at 5 h. 30 m. P. M., it will be dark enough to watch its progress through the most interesting stage. The moon will not be entirely lost to sight when totally immersed in the earth's dark shadow. She will shine faintly, with a lurid, copper-colored light, thus giving an unearthly aspect to the surrounding landscape. This light is refracted into the shadow by the earth's atmosphere. It varies greatly in different eclipses, depending upon the quantity of clouds and vapor in that portion of the atmosphere where the sunlight must graze in order to reach the moon.

The magnitude of the eclipse is 1.647, the moon's diameter being 1.

CONJUNCTION OF THE MOON AND SATURN.

An interesting phenomenon will occur on the same day that the lunar eclipse takes place. The moon will be in conjunction with Saturn on the 28th at 8 h. 28 m. A. M., being at that time 1° 10' south of the planet. When the eclipse occurs, Saturn will be west of the moon, and in her near vicinity, shining brightly while her fair face is hidden from view. After the eclipse is over, the moon, with her full round face, and Saturn, the evening star, only six days after opposition, will make a picture fair to see. Saturn may be readily recognized, for the twin stars Castor and Pollux are on the northwest and Procyon is on the southwest. He may also be known by his soft, serene light and by the absence of bright stars in his immediate neighborhood.

THE MORNING SKY AT THE CLOSE OF JANUARY.

The four planets Venus, Jupiter, Mars, and Uranus, as well as the first magnitude star Spica, may be seen almost in a row near the ecliptic in the morning sky. If the observation be made about 5 o'clock at the close of January, the planets and star will be visible in the following order:

Uranus will be high in the heavens, barely visible to the naked eye, but easily found with the aid of an opera glass or small telescope, about 4° northwest of Spica. The brilliant Spica is the next member of the starry ladder, and needs no pointing out, for it shines in solitary grandeur and is within two hours or 30° of the meridian. Mars is the third comrade in the celestial fellowship, shining with a ruddy hue about 7° northeast of Spica; Mars, Uranus, and Spica forming a small triangle. Jupiter, king of planets, appears next, on the celestial track, beaming with light. He is about half way between the horizon and zenith, as he rises not far from 2 o'clock. Venus, fairest of the stars and brightest of the row, completes the shining picture, being at that time only a few degrees above the horizon. If the observation be made earlier, the stars will be nearer the horizon; if it be made later, the stars will be higher in the heavens. The order of ap-