FIG. 13. Tool Stand, with the height gauge and packing piece racks and rack for holding drawing and instruction card for work in progress.

made by a competent time-study man whose work ranks with the best. His report made at the time is worthy of careful attention for it shows the pains and perseverance called for:

On applying time study to the lining machine several changes were found necessary to get the machine into proper condition for applying the task and bonus. Formerly the procedure for loading the elevator of this machine, which rested about 6" above the floor at its lowest point, was to bring a load of board to the elevator and then re-pile it on the elevator. We have sunk the feeding elevator of this machine into the floor on a level with the floor, so that a Cowan platform of loaded board can be rolled right on to the elevator with a Cowan truck.

Time study showed that the manner in which a roll of paper was made ready for the job being run on the lining machine was wrong, it being done as follows:

There was a shaft with square-faced cones. The object of these square-faced cones was to drive the corners into the wooden cores of the paper rolls, but as our paper here has not come with wooden cores for the last few years past, it has been found that these square cones from the constant driving into the iron cores, which are now supplied in the rolls of paper, have worn the corners off from those square cones, so that the man making the roll of paper ready has to drive wooden wedges in to secure the rolls of paper tightly to the reel shaft. There was also an inadequate friction brake on the end of the shaft, held together by means of a carpenter's C clamp in order to get the proper tension required to pull this paper smoothly over the paste rolls.

It was deemed advisable to have a new reel shaft made. This in turn suggested another idea, that of having two reel rods and always having the next roll of paper needed ready and resting on extra brackets, which were provided at this time to hold the next roll of paper to be used on the machine. It was the previous custom when the roll of paper ran out to stop the machine and all hands start to make the next roll of paper ready. At the present time, with the use of the new roll rods, the machine tender will make the next roll ready while the machine is running.

FIG. 14. Standard Work-place, Trucks and Containers for Folding Handkerchiefs.

It has also been found necessary in connection with the raising of the rolls of paper on the machine, owing to the height between the top of the machine and the ceiling, to have a set of tongs made which will enable us to get a very short hitch with the tackle blocks on the roll of paper. Before, a rope sling was used, and by the time the roll had been drawn up into the machine there would be slack enough occasioned by the stretch of the rope sling so that the roll could not be pulled up high enough to get it on the bearings of the machine; so it was usually the custom to call four or five men in and all hands boost the roll up on to the bearings.

Another condition which showed up at this time was the fact that sometimes at the finish of an order there would be quite a sizable roll of paper left on the machine, it being too heavy for the machine tender and move man to remove from the machine. It has been found necessary to provide another track on the ceiling directly over where this roll would be resting, to enable us to lift this roll off with the tackle block. We could not use the track that the next roll ready is raised by, because it is some two feet back of the center of the roll that is being used.

Time study on this machine has also shown that it is advisable, if the scheme is practical, to feed the sheets of board into the lining machine the narrow way of the sheet instead of the long way of the sheet. The gain in sheets (ranging approximately from ten per cent to fifty per cent) against each size of board run per minute is shown on report made relative to changing the sizes of lining paper. In order to accomplish this end it was found necessary to put a wider canvas on the lining machine, the width of the canvas then used being 36". This width could not be used any longer, as the longest sheet of board that we would need to run in the machine would be 38". In order to get a canvas to accommodate these 38" sheets, it was thought best to provide one the full face of the rolls, which is 40", and in doing this it meant that we had to reconstruct the guides which caused this canvas to run in the center of the machine and not traverse from side to side.

It was also found necessary in connection with the running of the sheets the opposite way in the machine to provide a new side gauge. This should have been done sometime ago, as the gauge that was on was in a dilapidated condition; and in order to feed these sheets into the machine the narrow way, it was necessary to bring the end roll next to the feeder back towards the feeder a distance of about 18", so that feeder could reach the feed-in canvas.

Having received the new width canvas and installed it on the machine, we decided to make a run of the five sizes of board that we could use, the longest rolls of lining paper that we had, to see what the effect would be on the board of running it the grain with the circumference of the rolls. We