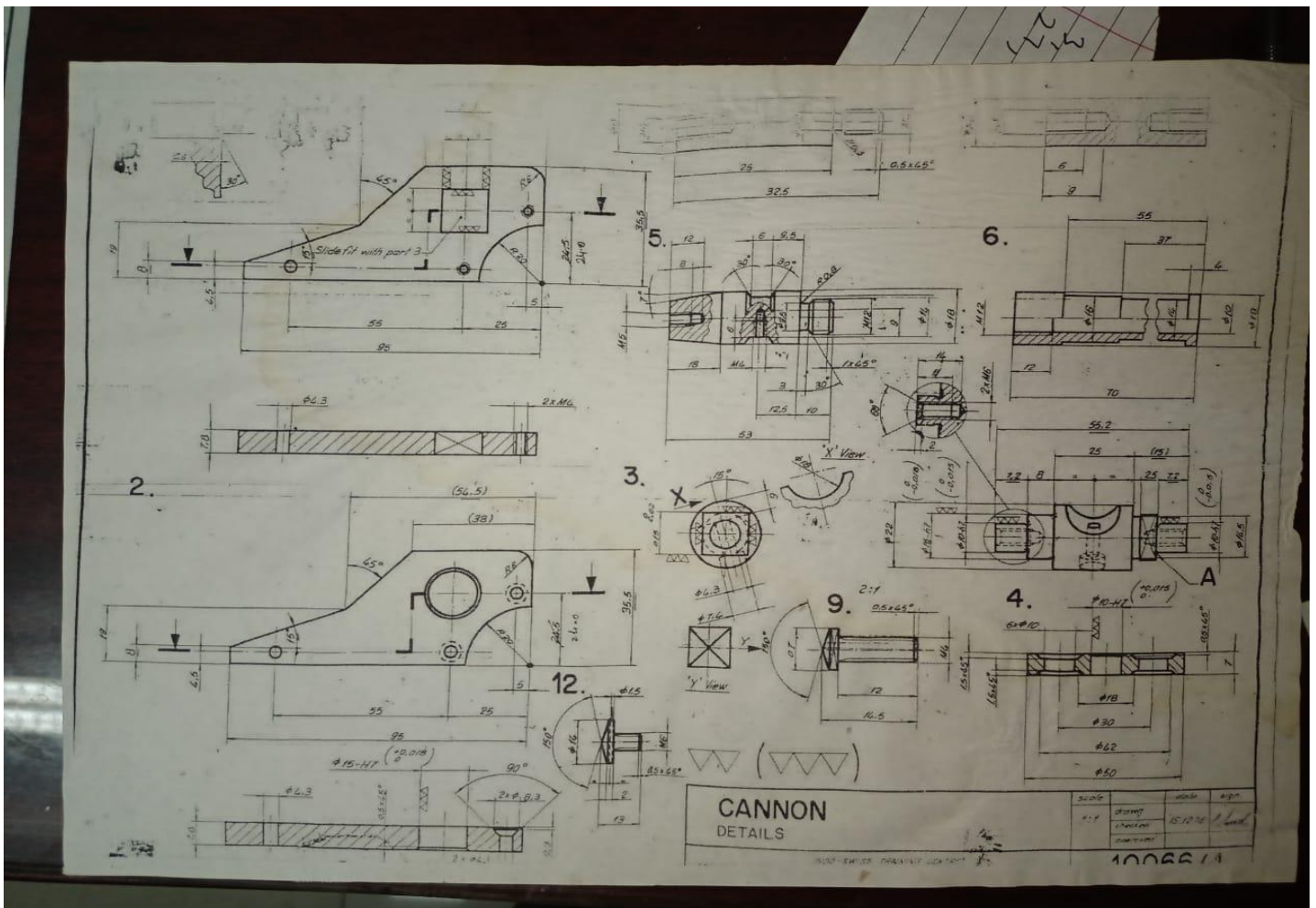


Design and Fabrication of Miniature Cannon.

I designed and fabricated a miniature cannon, manufacturing critical components like the axle, spacer, barrel, and side plates using conventional machining techniques. Precision was ensured through careful planning and execution, with a focus on dimensional accuracy and optimal functionality. The project enhanced my skills in design, machining, and quality control.

~Prince Gupta

The first step in the design process involved selecting the materials suitable for each component based on their required mechanical properties, such as strength, durability, and precision. Once the materials were finalized, I proceeded to design each part of the miniature cannon, carefully considering factors like alignment, load-bearing capacity, and ease of assembly. The design was modeled using 3D CAD software to visualize the overall assembly, ensuring that all components fit together correctly and function as intended.



The critical components of the cannon were fabricated using conventional machining techniques, ensuring accuracy and attention to detail throughout the process. The axle, which serves as the core element connecting the wheels to the main body of the cannon, was manufactured using a turning operation on a lathe. This process allowed for the precise shaping of the axle to achieve the required diameter and smooth surface finish, ensuring proper rotation and minimal friction. I also employed drilling and boring operations to create the necessary holes for the side plates and other parts to be mounted securely.

The spacer was another key component that required careful fabrication. It was designed to maintain the required distance between two parts and provide stability to the overall assembly. I used a combination of milling and turning operations to produce the spacer with precise dimensions, ensuring that it fit perfectly into the assembly without any gaps or misalignments. The barrel of the cannon was the most complex part, as it had to be hollow and capable of withstanding pressure when assembled. I utilized a combination of lathe and drilling techniques to fabricate the barrel to the required diameter and length, ensuring that the bore was smooth and free from any defects. This step required careful attention to detail, as even the slightest deviation in dimensions could affect the functionality and performance of the cannon.

The side plates, which served to provide structural integrity to the cannon, were designed with adequate strength to hold the barrel in place and support the overall assembly. Using a milling machine, I precisely cut and shaped the side plates to the required thickness and dimensions, ensuring that they aligned perfectly with the axle and barrel. The holes for bolts and fasteners were also drilled with precision, ensuring that the plates could be securely mounted to the other components.

Throughout the fabrication process, I employed various quality control measures to ensure that each component met the design specifications. This included verifying the dimensions using calipers and micrometers, as well as conducting functional tests to ensure that all components fit and operated together as expected. The final assembly was done with careful attention to detail, ensuring smooth movement of the axle and proper alignment of the barrel and side plates. In conclusion, the project involved the meticulous design and fabrication of a miniature cannon, where I utilized conventional machining techniques to manufacture each critical component with precision. The successful completion of this project highlighted the importance of planning, accuracy, and attention to detail in mechanical design and manufacturing processes. The project not only enhanced my practical skills but also reinforced the importance of quality control and optimized functionality in engineering design.





